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EDITORIAL**NATIONAL SURGICAL, OBSTETRIC AND ANAESTHESIA PLANNING (NSOAP): A NEW IMPERATIVE****Medical practice employee and Social media policy.**

The desire for affordable and equitable health care system for all populations remains an important global health goal, though its attainment is still in the distant future.

Universal access to essential surgical, obstetric and anaesthesia care facilitated by qualified specialists is lacking. This is was highlighted in the Lancet Commission Report on Global Surgery published in 2015.

The key findings are that 5 billion patients lack affordable surgical and anaesthetic care, 143 million surgeries are needed every year, 33 million patients face catastrophic health expenditure following surgery and anaesthesia, investment in surgery and anaesthesia promote health and economic growth, surgery is an indivisible and inevitable part of health care.

The advanced economies in Western Europe and elsewhere do not have any unmet need for surgery while sub-Saharan Africa shows an unmet need for 5,625 per 100,000 of the population. The problem of lack of access to surgery and anaesthesia is most severe in the low and middle income countries.

The MDGs and SDGs are global initiatives which provide a multisectoral framework for addressing national development problems including health problems. Solving these health challenges require the provision of efficient health services, well-trained and well distributed health workforce, adequate infrastructure, integrated information service, adequate finance and good governance

National Surgical Obstetric and Anaesthesia Planning provides a business case which is internally driven and involves multiple stakeholders working towards a common goal of problem solving instead of the current fragmented approach adopted by many countries to solve their health care challenges. NSOAP provides national data and an opportunity for improvement in access and standard of care as well as mitigating the financial burden of patients. It is noteworthy that countries such as Zambia, Ethiopia, Senegal and Nigeria have produced National Surgical Plans ready for implementation.

The World Health Assembly Resolution 68.15 in 2015 states that by the year 2030 there would be universal coverage of surgery globally. Each nation should have indicators and monitoring tools and to report its progress every 3 years.

The health delivery system of Ghana involves the Teaching hospitals, Regional hospitals, District Hospitals, Maternity homes, CHPS compounds and private facilities. Ghana must produce a NSOAP as a matter of urgency by involving all stakeholders in order to have an estimation of our surgical burden, both met and unmet and determine how to address it.

Our Colleges that produce specialists should endeavor to harmonize their curricula in order to accelerate training and increase their output. The training of other health cadres within the surgical community should also be encouraged and promoted.

Social media and online conduct policy.

All health institutions should have an official guideline towards the use of social media. This will avoid disasters such as the misuse of license governing a software or the illegal use of technology.

Health workers should abide by all laws and policies governing confidentiality. There should be no disclosure of identifiable information about patients or coworkers. The health workers should identify themselves with the content they post on the internet and be responsible for it. It will be wise to ask for the permission of the employer before establishing a practice-hosted blog or other social media site or forum. No photos should be taken from inside the workplace which could capture documents, paperwork, patient charts or other information protected by privacy law.

Reference.

1. www.thelancet.com Vol 376 December 2010
2. <https://www.physicianspractice.com>>blog

J.D. Seffah
Editor-In-Chief

THE EFFECT OF NEUTROPENIA ON THE DELIVERY OF CHEMOTHERAPY IN BREAST CANCER PATIENTS AT KORLE BU TEACHING HOSPITAL IN ACCRA, GHANA

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Abstract

Introduction: Treatment of breast cancer involves chemotherapy, of which the commonest complication is neutropenia and febrile neutropenia. Neutropenic events interrupt the administration of effective chemotherapy and results in poorer outcomes.

This study evaluates the impact of neutropenia on the effective delivery of anthracycline-based chemotherapy in breast cancer patients and identifies those at risk of neutropenic events.

Methods: This is a prospective study of one hundred and ninety patients presenting with breast cancer who received both adjuvant and neoadjuvant chemotherapy from January 2013 to July 2014. Patients received cyclophosphamide, doxorubicin and 5-fluorouracil. Data collected included baseline absolute neutrophil count and subsequent absolute neutrophil counts on day

10 and day 20 throughout the course of therapy to identify any neutropaenic events. Univariate logistic regression analysis of age, body surface area and ECOG performance was done to determine factors associated with neutropaenia.

Results: The prevalence of neutropenia was 8.7% and that of febrile neutropenia was 0.24%. Body surface area of < 2 m² and first cycle neutropenia were found to be associated with an increased risk of developing neutropenia.

Conclusion: The prevalence of neutropaenia and febrile neutropaenia in this study was relatively low 8.7% and 0.24% respectively. The only factor found to be associated with neutropenic events is a BSA < 2m². This study forms a basis for a larger study aimed at identifying predictors and developing a model to predict neutropenia risk in the Ghanaian Population.

Key Words: Neutropenia, breast cancer, chemotherapy, absolute neutrophil count

Background

Breast cancer is the most common malignancy among women and the second most common cancer in the world¹. About 400 new cases of breast cancer are seen at Korle-Bu Teaching Hospital (KBTH) annually and it is the leading cause (17.4%) of female cancer deaths². Treatment involves combinations of surgery, chemotherapy, radiotherapy, hormone and/or targeted treatment.

Over the past decade there has been a shift towards the anthracycline- (doxorubicin/epirubicin) and taxane-based regimens as these have given better results than cyclophosphamide, methotrexate and 5-Fluorouracil (CMF)³. This trend towards the increased use of cyclophosphamide, doxorubicin and 5-Fluorouracil (CAF) is also evident from records in the chemotherapy suite at the surgical department of KBTH, where about 92% of breast cancer patients are placed on CAF.

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The use of chemotherapy in cancer treatment has been on the increase since the early 1990s and, subsequently, its associated complications are also on the increase. Cytotoxics directly affect the bone marrow and damage haematopoietic precursors of the neutrophils resulting in neutropenia. The commonest complications of myelosuppressive chemotherapy are neutropenia and febrile neutropenia. Neutropenia puts chemotherapy patients at risk of severe infections which is a major cause of morbidity and mortality in cancer patients. As such febrile neutropenia is regarded as an oncologic emergency. In the United States, it has been estimated that there is an incidence of >60,000 neutropenic hospitalisations annually, with an average cost of \$13,372 per hospitalisation and an associated inpatient mortality rate of 6.8%⁴. Neutropenia is classified as mild if Absolute neutrophil count (ANC) is between 1.0 × 10⁹/L and 1.5 × 10⁹/L, moderate when 0.5 × 10⁹/L to 1.0 × 10⁹/L and severe when ANC is less than 0.5 × 10⁹/L. Agranulocytosis occurs when ANC is less than 0.1 × 10⁹/L. The risk of infection is increased in severe neutropenia. Neutropenic events are more common with the anthracycline-based regimens than with CMF and also with increasing number of chemotherapy courses. Neutrophil counts drop below baseline value after the first course and recurs in-between courses⁵.

Neutropenic events interrupt the delivery of effective chemotherapy with regard to the timing and the dose delivered. There is a relationship between the chemotherapy dose-intensity a patient receives and the clinical outcome of the disease. The standard chemotherapy treatment practice when neutropenia develops includes treatment delays and dose modifications. This compromises optimal dose delivery and is associated with poorer outcomes⁶. The dose-intensity depends on both the dose administered and the timing of administration. Below a critical dose-intensity, a patient may not receive the desired benefit of the therapy. A critical dose-intensity of 85% has been adopted by several institutions following the work of Bonadonna et al.⁶

In a publication from the Radiation Oncology Unit of KBTH of 20 cases of febrile neutropenia, 7 had breast cancer. Documented absolute neutrophil counts (ANCs) ranged from 0 to $0.6 \times 10^9/L$ and mortality occurred in 2 (10%) patients. The use of granulocyte colony stimulating factor (G-CSF) for the patients was limited by funds⁷. This study evaluated the impact of neutropenia on the effective delivery of anthracycline-based chemotherapy in breast cancer patients. It assessed the factors that contributed to neutropenia and febrile neutropenia in breast cancer patients; critical information that could help pre-empt febrile neutropenia by selectively managing patients at risk.

Methods

In a prospective study one hundred and ninety consecutive patients who received both adjuvant and neoadjuvant chemotherapy at the chemotherapy suite of the Department of Surgery at the Korle Bu Teaching Hospital from January 2013 to July 2014 were studied. Patients receiving cyclophosphamide 500mg/m², doxorubicin 50mg/m² and 5-fluorouracil 500mg/m² (CAF) every 21 days for 6 cycles were included. Patients had T1 to T4 tumours with or without axillary lymph node involvement. Excluded were those patients who had metastatic disease, been exposed to previous chemotherapy or had established immunosuppression from other causes.

Data collected included patient demographics, body surface area, chemotherapy regimen, actual dose delivered, timing of administration, baseline absolute neutrophil count (ANC), day 10 and day 20 ANC and any other ANC when chemotherapy was delayed. Neutropenia was defined as $ANC < 1.0 \times 10^9/L$, and febrile neutropenia as $ANC < 1.0 \times 10^9/L$ plus fever of $\geq 38^{\circ}C$. Suspected or proven infections, antibiotic or granulocyte colony stimulating factor (G-CSF) use were also documented. Ethical clearance for the study was obtained from the Ethical and Protocol Review Committee of the University of Ghana Medical School [Protocol Identification Number: MS-Et/M.5 – P 4.3/2012-13]. Written informed consent was obtained from all participants and information kept confidential.

Results

A total of 190 patients (all females) were studied with a median age of 51.5 years [IQR, 42-58]. Their age distribution is shown in Table 1.

Table 1. Age distribution of patients who underwent chemotherapy

Age (yr.) (N=190)	Number (%)
15-24	1 (0.5)
25-34	14 (7.3)
35-44	41 (21.6)
45-54	61 (32.1)
55-64	54 (28.4)
65-74	14 (7.3)
75-84	5 (2.6%)

Fifty-six (29.5%) were younger than 45 years, 115 (60.5%) were between 45 and 64 years, and 19 (10%) were 65 years and older. One hundred and thirty-six patients (71.6%) were classified as Eastern Co-operative Oncology Group (ECOG) status 0, and 41 patients (21.6%) were ECOG status 1 (Fig.1).

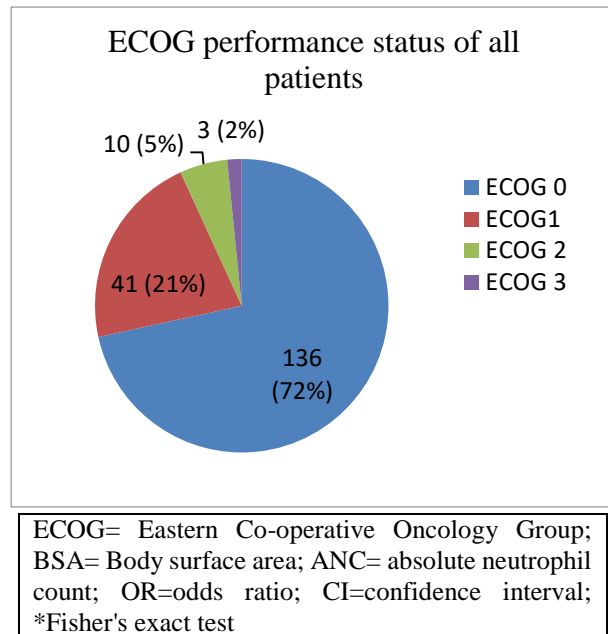


Fig. 1 Eastern Co-operative Oncology Group (ECOG) performance status of the patients

Patients with body surface area (BSA) of $< 2 m^2$ constituted 76.8% (n=146) whilst those with BSA of $\geq 2 m^2$ were 23.2% (n=44). Majority of the patients (99.5%, n=189) had baseline ANC of $\geq 1.0 \times 10^9/cells/L$. A total of 842 chemotherapy cycles were administered to 190 patients. One hundred and thirty-six patients (71.5%) completed six cycles of chemotherapy. The remaining 54 (28.4%) had a varied number of cycles of CAF. Two patients had their chemotherapeutic drugs changed from CAF to another regimen due to non-

response and 51 patients were either referred to the National Centre for Radiotherapy and Nuclear Medicine (Ghana) for further treatment or defaulted treatment and were lost to this study's follow up. There was one death from respiratory failure as a result of lung metastasis, though she was not metastatic at the start of chemotherapy.

Of the 842 chemotherapy cycles administered, 73 neutropenic events occurred giving a neutropenia incidence of 8.7%. There were only two cases of febrile neutropenia (temperature >38.0 o C), giving a febrile neutropenia incidence of 0.24%.

Table 2. Characteristics of patients who experienced first cycle neutropenia

Characteristic	1st cycle neutropenia		OR [95% CI]	p-value	
	Yes	No			
	n, % ¹	n, % ¹			
Age (N=190)					
	45 - 64 years	10 (55.6)	105 (61.0)	0.79 [0.24-2.82]	0.671
	≥ 65 years	2 (11.1)	17 (9.9)	0.98 [0.09-6.19]	0.982
	<45 years	6 (33.3)	50 (29.1)	1.00	
ECOG (N=190)					
	ECOG 1	6 (33.3)	35 (20.3)	1.77 [0.51-5.54]	0.281
	ECOG 2	0	10 (5.8)	Not estimable	1.000*
	ECOG 3	0	3 (1.7)	Not estimable	1.000*
	ECOG 0	12 (66.7)	124 (72.1)	1.00	
BSA (N=190)					
	< 2 m ²	17 (94.4)	129 (75.0)	5.67 [0.83-242.2]	0.063
	≥ 2 m ²	1 (5.6)	43 (25.0)	1.00	
Baseline ANC (N=190)					
	$< 1.0 \times 10^9$ cells/L	0	1 (0.6)	Not estimable	1.000
	$\geq 1.0 \times 10^9$ cells/L	18 (100)	171 (99.4)	1.00	

¹% are column percentages within each super row. ECOG= Eastern Co-operative Oncology Group; BSA=Body surface area; ANC=absolute neutrophil count; OR=odds ratio; CI=confidence interval; *Fisher's exact test

Table 3 shows factors associated with the presence of neutropenia. Fifty out of the 190 patients who were treated developed neutropenia, 26.3% [95% CI, 20.2-33.2]. Thirty-four (68.0%) of them were aged between 45 and 64 years, 13 (26.0%) were younger than 45 years and the remaining 3 (6%) were 65 years and above. Majority (72.0%; n=36) were classified as ECOG status 0, whilst 26% (n=13) were classified as ECOG status 1. All the patients (100%) with neutropenia had baseline ANC of $\geq 1.0 \times 10^9$ cells/L and 94% (n=47) had a BSA of < 2 m². In the univariate logistic regression analysis, BSA of < 2 m² was associated with neutropenia. The odds of patients with BSA of < 2 m² experiencing neutropenia was 6.49 [95% CI, 1.90-34.17] times higher compared with patients with BSA of ≥ 2 m² (p<0.001). Age, ECOG status and baseline ANC were not associated with neutropenia occurrence.

Ten out of the 18 patients (55.6%) who experienced 1st cycle neutropenia experienced a subsequent neutropenia. The presence of 1st cycle neutropenia was significantly associated with the development of subsequent neutropenia. The odds of experiencing

Table 2 shows the distribution of patients with 1st cycle neutropenia. The prevalence of 1st cycle neutropenia was 9.5% [95% CI, 5.7-14.6] (n=18). Of the 18 patients that developed 1st cycle neutropenia, 10 (55.6%) were aged between 45 and 64 years with 33.3% (n=6) younger than 45 years and only 11.1% (n=2) above 65 years. All the patients were classified as ECOG status 0 (66.7%, n=12) or 1 (33.3%, n=6). Majority of patients with 1st cycle neutropenia had BSA of < 2 m² (94.4%, n=17). In the univariate analysis, age, ECOG, BSA and baseline ANC were not associated with the occurrence of 1st cycle neutropenia (p>0.05), (Table 2).

subsequent neutropenia was 5.47 [95% CI, 1.76-17.14] in patients with 1st cycle neutropenia compared with patients who did not experience 1st cycle neutropenia (p<0.001) (Table 4).

The proportion of patients with a baseline ANC $< 1.5 \times 10^9$ /L was 4.7% [95% CI: 2.2-8.8] (n=9) and of these 55.6% (n=5) patients went on to have a subsequent neutropenia of $< 1.0 \times 10^9$ /L at some point during chemotherapy. Analysis shows no association between a baseline ANC $< 1.5 \times 10^9$ /L and subsequent neutropenia.

Sixty-nine (36.3%) patients experienced a total of 104 treatment delays in the delivery of 842 chemotherapy cycles, implying 12.4% of chemotherapy cycle delays. Eighty-seven (83.7%) of these delays were for up to seven days and the remaining 17 (16.3%) delays were for more than seven days (1 to 4 weeks). Forty-two patients had one delay in the course of treatment, 21 had two delays, 4 had three delays and 2 had four delays.

There were other causes of treatment delay among the patients studied. Apart from neutropenia (70.2%), other causes were infection (7.7%), feeling unwell (6.7%),

financial constraints (4.8%), high blood pressure (3.8%), and anaemia (3.8%). Out of eight clinically diagnosed infections, three were in neutropenic patients. These were respiratory tract infection (3), urinary tract infection (2), sepsis of unknown cause (1) and skin

infection/abscess (2). Of the four patients who were anaemic two required blood transfusion as their haemoglobin was less than 8.0g/dl. G-CSF was used in 3 patients.

Table 3. Characteristics of all patients who developed neutropenia

Characteristic	Neutropenia		OR [95% CI]	p-value	
	Yes n, %	No n, %			
Age (N=190)					
	45 - 64 years	34 (68.0)	81 (57.9)	1.39 [0.63-3.17]	0.383
	≥65 years	3 (6.0)	16 (11.4)	0.62 [0.10-2.71]	0.495
	<45 years	13 (26.0)	43 (30.7)	1.00	
ECOG (N=190)					
	ECOG 1	13 (26.0)	28 (20.0)	1.29 [0.55-2.91]	0.511
	ECOG 2	1 (2.0)	9 (6.4)	0.31 [0.01-2.38]	0.248
	ECOG 3	0	3 (2.1)	Not estimable	0.568*
	ECOG 0	36 (72.0)	100 (71.4)	1.00	
BSA (N=190)					
	< 2 m ²	47 (94.0)	99 (70.7)	6.49 [1.90-34.17]	<0.001
	≥ 2 m ²	3 (6.0)	41 (29.3)	1.00	
Baseline ANC (N=190)					
	< 1.0 × 10 ⁹ cells/L	0	1 (0.7)	Not estimable	1.000*
	≥ 1.0 × 10 ⁹ cells/L	50 (100)	139 (99.3)	1.00	

Table 4. Relationship between the occurrence of first cycle neutropenia and subsequent neutropenia

Characteristic	Subsequent neutropenia		OR [95% CI]	p-value
	Yes n, %	No n, %		
1st cycle neutropaenia (N=190)				
Yes	10 (23.8)	8 (5.4)	5.47 [1.76-17.14]	<0.001
No	32 (76.2)	140 (94.6)	1.00	

OR=odds ratio; CI=confidence interval

Discussion

This study has documented the prevalence of neutropenia in breast cancer patients on chemotherapy in the Korle Bu Teaching hospital and has demonstrated that it leads to ineffective delivery of chemotherapy through delays in administration. Similar to previous publications, the median age of the patients was 51.5 years, a decade less than that of developed countries^{2,8,9}. The prevalence of neutropenia was 8.7% with that of febrile neutropenia 0.24%. A 10-year review (1990-2000) of randomised clinical trials found neutropenia grades 3-4 in 1-78% of patients who received CMF and in 3-100% in those who received anthracycline-based therapy¹⁰. The 2006 ASCO guidelines quoted the incidence of chemotherapy-induced febrile neutropenia in breast cancer as 3-23%¹¹. This study therefore reports relatively low rates of neutropaenia and its related complications.

Benign Ethnic Neutropenia (BEN) has been described among people of African descent and is found in

otherwise healthy individuals with ANC < 1.5 × 10⁹/L in the absence of other causes of neutropenia. Breast cancer patients in Africa with BEN could have their treatment withheld, delayed or suboptimal doses given if this condition is not recognized. Current evidence however shows that patients with BEN can receive standard doses of chemotherapy safely¹² This fact is corroborated by this study, which found no association between baseline ANC < 1.5 × 10⁹/L on standard dose regimen and subsequent neutropenia.

According to the National Comprehensive Cancer Network (NCCN), the factors which put a patient at high risk of developing febrile neutropenia are previous chemotherapy, pre-existing neutropenia, age >65, concurrent or previous radiotherapy, poor performance status (ECOG>1), co-morbidities, open wounds, active tissue infections and anaemia¹³ A systemic review by Lyman et al identified four studies in which a low BSA is an increased risk for febrile neutropenia¹⁴ Advanced age, female sex, poor performance status, poor

nutritional status, and low baseline and first-cycle nadir blood cell count have also been identified as predictors of neutropenic events^{15,16}. The current study reports that patients with BSA of < 2 m² had a higher (6.49 times) chance of developing neutropenia compared with patients with BSA of ≥ 2 m² as in these publications and can be used as a predictor of neutropenia. However, we did not find an association between age, ECOG status, baseline ANC and neutropenia. The sample size was probably not large enough to detect a significant association in the latter factors. In this analysis, patients who experienced neutropenia after the first cycle of chemotherapy were more likely (5.47 times) to develop subsequent episodes of neutropenia (Table 4). This means that in addition to using BSA as a predictor, once a person did develop first cycle neutropenia there was a significant risk of another episode of neutropenia during the course of treatment. These predictors would provide a guide in selecting patients who would benefit from Granulocyte colony stimulating factor (G-CSF) prophylaxis.

Guidelines for the use of G-CSF recommend primary prophylaxis in patients at a high risk of developing infection only in cancers with about 20% incidence of chemotherapy-induced febrile neutropenia¹¹. This study found a low neutropenia and febrile neutropenia rate. In this case, primary prophylaxis with G-CSF is not routinely indicated but should be recommended as secondary prophylaxis and be given after an episode of febrile neutropenia or severe or prolonged neutropenia. Combining this with first cycle neutropenia and BSA < 2m² may further help select those who would benefit from prophylaxis. This more targeted use of G-CSF is known to be more cost effective with fewer risks of its side effects. G-CSF does not prevent neutropenia but improves the rate of recovery of neutropenia and therefore reduces the days of delay in giving anti-cancer treatment while the relative dose intensity (RDI) can be maintained. G-CSF was used in only 3 patients in this study, its use being limited largely by cost since patients had to acquire it from out of pocket purchases.

A reduced dose-intensity below a threshold of 85% compromises outcome. This was popularised in a landmark paper by Bonadonna who found a significantly higher relapse free survival in those who had less than the optimal dose intensity⁶. Similarly, Lyman conducted a nationwide survey and found in addition to dose reductions there were treatment delays ≥ 7 days in 24.9% of patients, resulting in 55.5% of patients receiving RDI less than the critical 85%¹⁷. In this study significant proportion of patients (36.3%) experienced treatment delays of up to 4 weeks, with almost 40% of these being delayed more than once. Several causes of treatment delays were found but neutropenia (70.2%) was the commonest cause by far. The delays in administration of chemotherapy are enough to cause a reduction in the RDI. However, this study did not follow up patients to determine the outcomes or overall survival of these patients.

Suboptimal chemotherapy from treatment delays can be improved by interventions aimed at ensuring optimum delivery of chemotherapy, with regard to dose and timing. We believe that targeted prophylaxis would lead to a significant reduction in number and duration of treatment delays. In the study by Lyman, delivery of suboptimal doses was found to have decreased from about two-thirds to a third of the patients from the early 1990s to the late 1990s, and this was attributed to a better physician understanding of chemotherapy dosing and quality of care¹⁷. There are some validated and yet to be validated models which can be used to predict or assess a person's risk of neutropenic events^{18,19}.

Conclusion

The prevalence of neutropaenia and febrile neutropaenia in this study is relatively low 8.7% and 0.24% respectively but when it occurs is a major cause of suboptimal delivery of chemotherapy. The only factors found to be significantly associated with neutropenic events was BSA < 2m² and first cycle neutropaenia. This study forms a basis for a larger study aimed at identifying predictors and developing a model to predict neutropenia risk in the Ghanaian Population.

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PERINATAL RISK FACTORS ASSOCIATED WITH INTRAPARTUM PERINEAL INJURIES AT THE KORLE BU TEACHING HOSPITAL

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Abstract

Background: Obstetric perineal injury is a major contributor to women's reproductive health problems. More than 60% of women suffer varying degrees of obstetric perineal injuries during vaginal delivery requiring repair. This study determined the risk factors associated with perineal injury.

Method: Prospective observational study of 356 women who had singleton term vaginal delivery between 1st April and 31st May, 2018 at the KBTH. Socio-demographic and clinical data of participants were collected and analysed to determine association between variables. A p-value of <0.05 was considered statistically significant.

Results: Two hundred and thirty-six women (66.29%) had vaginal deliveries with no perineal injuries comprising 81 primiparous and 155 multiparous women. Perineal injury among the study participants were 120/356 (33.71%) while perineal injury for first degree, second degree, third degree and fourth degree were 75/356 (21.07%), 41/356 (11.52%), 2/356 (0.56%), 2/356 (0.56%) respectively. A total of 948 vaginal deliveries was conducted during the study period. The odds of developing a perineal injury was 8

times higher among participants with previous surgery on genital tract (OR, 8.29 [95% CI 2.69-25.6]; p<0.001) and 18 times higher among participants with previous postpartum complication (OR, 18.00 [95% CI 4.06-79.71], p<0.001). Babies with birth weights ≥ 2.5 kg had 4.11 increased odds of developing perineal injury when compared to those with birth weights <2.5kg (OR, 4.11 [95% CI, 1.70-9.98] p=0.001). Vacuum delivery was strongly associated with a 4.81 odds perineal injury (OR, 4.81 [95% CI, 1.22-18.9] p<0.014).

Conclusion: The incidence of perineal injury among women who had vaginal delivery at the KBTH maternity during the study period of (12.66%) was high compared to other studies from the West African Sub-region. Risk factors such as previous postpartum complication, episiotomy, and gestational age at delivery, head circumference of the baby, asthma, hypertension and past genital tract surgery were significantly associated with perineal injury. Early identification of women at risk of perineal injury could help with interventions to reduce the incidence of this complication during childbirth.

Key Words: Perineal injury, Risk factors, Vacuum delivery, Haemorrhage

Introduction

Obstetric perineal injury (OPI), which refers to tears that involve the external and/or internal anal sphincter is a well-known complication of vaginal birth. Obstetric perineal injury (OPI) is an important aetiological contributor to women's reproductive health problems such as sexual dysfunction, pelvic organ prolapse, perineal pain, and bowel and bladder dysfunction.

Maternal morbidity associated with perineal injuries from labour is a major public health concern affecting many women globally. Nearly two million women globally are affected by OPI with an estimated 50,000 to 100,000 new women being affected each year (Barageine et al., 2014). Over 60% of women suffer

from Obstetric perineal injury (OPI) with more than half requiring repair after spontaneous vaginal delivery (Fernando, 2007). Incidence of major degree perineal injury is varied and wide. While some studies have reported a reduction in the rates of injuries as low as 1%, other studies show a rising trend as high as 16% (Graham et al., 2005, Verghese et al., 2016).

Complications after vaginal delivery and associated morbidities are under-reported in most resource-limited settings (Edwards et al., 2006). There may be between 100,000 and 1million women living with fistula in Nigeria alone and over 70,000 in Bangladesh. In Ethiopia, it is estimated that 9,000 women annually develop a fistula of which only 1,200 are treated (WHO, 2006). Multi-country study conducted by the WHO on the incidence of severe perineal injuries in seven African countries (Algeria, Angola, Democratic Republic Congo, Kenya, Niger, Nigeria and Uganda) reported an average incidence of 2.1% with 0.6% as lowest and 7.8% as highest (Hirayama et al., 2012). In Ghana, the perineal injury is said to contribute to about 3.1% of recto-vaginal fistula (Danso KA, 1996).

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Obstetric characteristics such as primiparity, and instrument-assisted vaginal delivery and weight of the newborn child is associated with severe perineal injury in different populations (Kudish et al., 2008, Verghese et al., 2016). Other risk factors are advanced maternal age, post-term pregnancies, labour induction, prolonged second stage of labour, epidural anaesthesia, Asian ethnicity, and episiotomy have been identified in some populations (Goldberg et al., 2003, Graham et al., 2005, Edwards et al., 2006).

Complications of perineal injury following vaginal delivery include haemorrhage, haematoma, perineal pain, dyspareunia, and fistula formation (Fernando, 2007).

Complications of obstetric perineal injuries include obstetric haemorrhage, the breakdown of repair, sepsis, incontinence of urine and of faeces/flatulence following fistula formation, perineal pain, dyspareunia (painful sexual intercourse), and poor healing of a repaired perineal injury (Pergialiotis et al., 2014). Faecal/urinary incontinence has been found to be one of the contributing factors to marital disharmony and divorce in Sub-Saharan Africa (Lowder et al., 2007). Affected women in some cases are withdrawn from their families and are not able to mingle with society due to the bad odour from faecal /urine incontinence (Baumann et al., 2007).

Obstetrics and Gynaecology unit of the Korle bu Teaching Hospital (KBTH) maternity conducts on average between 25-30 deliveries a day and in the year 2017, the total delivery was 9,215 births of which over 4,884 births were spontaneous vaginal deliveries (KBTH, 2017). Some of these vaginal deliveries had perineal injuries with different degrees of severity.

There is a growing awareness of the complication and its long-term effect on maternal and fetal health in resource-limited countries including Ghana. However, there is very little literature on incidence, specific risk factors, and associated morbidity of OPI in Ghana. This study seeks to determine the current incidence and subtypes of perineal injury, and its associated risk factors at KBTH, a quaternary referral institution with a patient mix from all communities in and around Accra.

Methods

Study design and setting

This was a prospective observational study of women who had singleton term vaginal delivery at the obstetric unit Korle Bu Teaching Hospital (KBTH). KBTH is a 2000 bed quaternary referral hospital with several departments, Specialist Clinics, Wards, Pharmacies and Reference Laboratories. Study protocol was approved by Ethical and Protocol Review Committee of the School of Medicine and Dentistry (CHS-Et/M.10 – P 3.1/2016-2017). The study was conducted over a two-month period from 1st April to 31st May, 2018. Perineal injury was classified into first, second, third- and fourth-degree perineal tears

(including episiotomies) following spontaneous vaginal deliveries (SVD) or assisted vaginal deliveries.

Socio-demographic characteristics, Medical history and Past Obstetric history were retrieved from patients' records

Very ill women, multiple pregnancies, intrauterine fetal deaths, preterm vaginal deliveries, and women who were referred to the KBTH in the second stage of labour were excluded from the study. Eligible participants who met the inclusion criteria were recruited through simple random process after the study protocol was explained to them. All participants provided written informed consent. All singleton term vaginal deliveries were examined for perineal injuries and had rectal examination to assess sphincter tone. The women were reviewed at two (2) weeks and six (6) weeks post-delivery clinics to identify any other morbidity associated with perineal injury at the postnatal clinics. Pain was assessed with the help of the Numeric Rating Scale (NRS) where level of pain intensity was scored from zero as "no pain" and ten as "worse pain". Pain score ranging from 0 - 4 were categorized as "mild" while scores from 5 - 6 as "moderate" and categorized 7 - 10 as "severe (Pathak et al., 2018)

Statistical Analysis

Data was entered into Statistical Package for Social Sciences (SPSS, version 23; Chicago, IL) for analysis. Data were summarized as frequencies and proportions. Logistic regression analysis was used to determine variables associated with perineal injury and reported as Odds Ratio with 95% Confidence Interval. All reported p-values were two-sided and considered statistically significant at a level of $p < 0.05$.

Results

The incidence of perineal injury among women who had vaginal delivery during the study period was 120/948 (12.66%). The incidence of perineal injury for first degree, second degree, third degree and fourth degree were 75/948 (7.91%), 41/948 (4.32%), 2/948 (0.21%), 2/948 (0.21%) respectively.

A total of 948 women had vaginal deliveries during the study period and 356 were recruited for the study. Two hundred and thirty-six (66.29%) had vaginal deliveries with no perineal injuries while 120 (33.71%) women had obstetric perineal injuries of varying degrees of severity. The prevalence of perineal injury for first degree, second degree, third degree and fourth degree were 75/356 (21.07%), 41/356 (11.52%), 2/356 (0.56%), 2/356 (0.56%) respectively.

Table 1 illustrates the distribution of socio-demographic participants who were mostly Ghanaian women of varied ethnicity and ages. Five study participants (1.4%) who were non-Ghanaians were from Togo (3), Ivory Coast (1) and Nigeria (1). The mean age was 29.01 \pm 5.95 years with a range of 14 to 46 years. Majority of the study participants were between the ages

Table 1: Socio-demographic characteristics

	Frequency (%)
Characteristics	N = n (%)
Age group (years)	
<20	21 (5.9)
20-29	169 (47.5)
30-39	152 (42.7)
40+	14 (3.9)
Marital status	
Married	286 (80.3)
Single/cohabiting	70 (19.7)
Educational level	
Secondary education	179 (50.3)
Basic education	86 (24.2)
Tertiary education	68 (19.1)
No formal education	23 (6.5)
Religion	
Christian	313 (87.9)
Muslim	43 (12.1)
Nationality	
Ghanaian	351 (98.6)
Non-Ghanaian	5 (1.4)
Occupation	
Private employment	227 (63.8)
Not economically active	50 (14.0)
Public employment	48 (13.5)
Employed but not working at the moment	17 (4.8)
Unemployed but seeking	11 (3.1)
NGO employment	3 (0.8)

of 20 and 39 years. Majority of study participants 286 (80.3%) were married.

Educational level and occupation of participants were significantly associated with perineal injury. The odds of developing a perineal injury was 2.6 times higher (OR, 2.60 [95% CI, 0.91-7.83], $p=0.046$) among participants with basic level education than those who had no formal education. The odds of developing a perineal injury was 4 times higher among women who were unemployed but seeking (OR, 4.14 [95% CI, 1.08-17.45], $p=0.017$) and those employed but currently not working (OR, 4.00 [95% CI, 1.29-12.87] $p=0.007$) compared to women who are not economically active (Table 2).

History of asthma, hypertension and anaemia were significantly associated with perineal injury.

While asthma (OR, 4.81 [95% CI, 1.22-18.9] $p=0.035$) and hypertension (OR, 6.30 [95% CI, 1.67-23.7] $p=0.004$) were associated with an increased odd of developing perineal injury, the odds of patients with anaemia developing perineal injury was decreased, (OR, 0.38 [95% CI, 0.20-0.69] $p=0.001$). Other medical conditions such as diabetes mellitus, depression, sickle cell disease, heart disease, chronic kidney disease, anxiety and high cholesterol was not associated with obstetric perineal injuries (Table 3).

Past obstetric history of participants such as past gynaecologic surgery, increasing gravidity, number of prior spontaneous vaginal deliveries, perineal injuries needing repair in previous deliveries, episiotomy in past delivery, and parity of two to five and above were all significantly associated with obstetric perineal injury. The odds of developing a perineal injury was 8 times higher among participants with previous surgery on genital tract (OR, 8.29 [95% CI 2.69-25.6]; $p<0.001$) and 18 times higher among participants with previous postpartum complication (OR, 18.00 [95% CI 4.06-79.71], $p<0.001$). Past history of caesarean delivery, the type of pregnancy (singleton / multiple), prior history of stillbirths, type of accoucheur (midwife / resident / consultant), type of presentation (cephalic / breech), and maternal weight was not associated with perineal injuries (Table 4a). Gestational age at delivery, duration of second stage of labour and induction of labour also influenced the odds of developing a perineal injury (Table 4b).

Using Mann-Whitney test to estimate blood loss after delivery, women who had a perineal injury on the average bled more than those who did not (OR, 1.003 [95% CI, 1.001-1.004] $p<0.001$). Participants who had babies with birth weights $\geq 2.5\text{kg}$ had 4.11 increased odds of developing perineal injury when compared to those with birth weights $< 2.5\text{kg}$ and this effect was statistically significant (OR, 4.11 [95% CI, 1.70-9.98] $p=0.001$). Analysis of head circumference of babies showed babies with slightly bigger mean head circumferences (33.3 ± 2.0) cm developed perineal injuries compared to those with smaller mean head circumferences (32.1 ± 1.7) cm and this effect was statistically significant (OR, 1.31 [95% CI, 1.20-1.43] $p<0.001$) (Table 5). Participants with severe postpartum perineal pain had increased odds of perineal injury compared to those without perineal pain by a factor of 11.8 (OR, 13.75 [95% CI, 2.82-129.89] $p<0.001$) while episiotomy (OR, 4.26 [95% CI, 2.52-7.21] $p<0.001$) was strongly associated with the development of perineal injury. Vacuum delivery was strongly associated with a 4.81 odds perineal injury (OR, 4.81 [95% CI, 1.22-18.9] $p<0.014$). Cervical tears, rectal sphincter tone and outcome of babies in the neonatal intensive care unit (NICU) did not yield any strong statistical association with perineal injury (Table 6).

Table 2: Socio-demographic factors associated with perineal injury

Characteristic	Perineal injury		OR [95% C.I]	p-value
	Yes N = 120 n, %	No N = 236 n, %		
Age group				
<20	7 (5.8)	14 (5.9)	0.90 [0.18-4.82]	0.884
20-29	64 (53.3)	105 (44.5)	1.10 [0.31-4.36]	0.873
30-39	44 (36.7)	108 (45.8)	0.73 [0.21-2.95]	0.595
40+	5 (4.2)	9 (3.8)	1.00	
Marital status				
Married	99 (82.5)	187 (79.2)	1.24 [0.70-2.18]	0.485
Single/cohabiting	21 (17.5)	49 (20.8)	1.00	
Educational level				
Tertiary education	27 (22.5)	41 (17.4)	1.23 [0.42-3.84]	0.675
Secondary education	35 (29.2)	144 (61.0)	0.46 [0.16-1.35]	0.093
Basic education	50 (41.7)	36 (15.3)	2.60 [0.91-7.83]	0.046
No formal education	8 (6.7)	15 (6.4)	1.00	
Religion				
Christian	106 (88.3)	207 (87.7)	1.06 [0.54-2.09]	0.865
Muslim	14 (11.7)	29 (12.3)	1.00	
Nationality				
Ghanaian	118 (98.3)	233 (98.7)	0.76 [0.13-4.61]	0.764
Non-Ghanaian	2 (1.7)	3 (1.3)	1.00	
Occupation				
Unemployed but seeking	11 (9.2)	5 (2.1)	4.14 [1.08-17.45]	0.017
Public employment	23 (19.2)	24 (10.2)	1.80 [0.74-4.45]	0.157
Private employment	51 (42.5)	165 (69.9)	0.58 [0.29-1.22]	0.109
Employed but not working at the moment	17 (14.2)	8 (3.4)	4.00 [1.29-12.87]	0.007
NGO employment	1 (0.8)	2 (0.8)	0.94 [0.02-19.34]	0.962
Not economically active	17 (14.2)	32 (13.6)	1.00	

*OR = Odds Ratio**C.I = Confidence Interval***Table 3:** Medical history associated with perineal injury

Characteristic	Perineal injury		OR [95% C.I]	p-value
	Present N = 120 n (%)	Absent N = 236 n (%)		
High cholesterol				
Yes	2 (1.7)	5 (2.1)	0.78 [0.15-4.10]	1.000
No	118 (98.3)	231 (97.9)	1.00	
Anxiety				
Yes	2 (1.7)	6 (2.5)	0.65 [0.13-3.27]	0.722
No	118 (98.3)	230 (97.5)	1.00	
Asthma				
Yes	7 (5.8)	3 (1.3)	4.81 [1.22-18.9]	0.035
No	113 (94.2)	233 (98.7)	1.00	

Continuation of Table 3: Medical history associated with perineal injury

Sickle cell disease				
Yes	4 (3.3)	2 (0.8)	4.03 [0.73-22.3]	0.185
No	116 (96.7)	234 (99.2)	1.00	
Heart disease				
Yes	2 (1.7)	2 (0.8)	1.98 [0.28-14.3]	0.606
No	118 (98.3)	234 (99.2)	1.00	
Hypertension				
Yes	9 (7.5)	3 (1.3)	6.30 [1.67-23.7]	0.004
No	111 (92.5)	233 (98.7)	1.00	
Anaemia				
Yes	15 (12.5)	65 (27.5)	0.38 [0.20-0.69]	0.001
No	105 (87.5)	171 (72.5)	1.00	
Chronic kidney disease				
Yes	2 (1.7)	1 (0.4)	3.98 [0.36-44.4]	0.264
No	118 (98.3)	236 (100.0)	1.00	
Depression				
Yes	2 (1.7)	7 (3.0)	0.55 [0.11-2.71]	0.723
No	118 (98.3)	229 (97.0)	1.00	
Diabetes				
Yes		4 (3.3) 3 (1.3)	2.68 [0.59-12.2]	0.232
No	116 (96.7)	233 (98.7)	1.00	

*OR =Odds Ratio**C.I = Confidence Interval***Table 4 (a): Past obstetric history**

Characteristic	Perineal injury		OR [95% C.I]	p-value
	Yes N = 120 n (%)	No N = 236 n (%)		
Past gynaecologic surgery				
Yes	11 (9.2)	9 (3.8)	2.55 [1.03-6.32]	0.038
No	109 (90.8)	227 (96.2)	1.00	
Gravida group				
0-4	110 (91.7)		176 (74.6) 3.75 [1.84-7.63]	<0.001
5 and above	10 (8.3)	60 (25.4)	1.00	
Parity group				
P2-P5 and above	99 (82.5)	155 (65.7)	2.46 [1.40-4.46]	0.001
P1	21 (17.5)	81 (34.3)	1.00	
Number of Prev. SVD grouped (N=251)				
1	55 (57.3)	49 (31.6)	2.90 [1.71-4.92]	<0.001
≥2	41 (42.7)	106 (68.4)	1.00	
Number of Prev. CS (N=17)				
1	10 (76.9)	4 (100.0)	Not estimable	0.541
≥2	3 (23.1)	0 (0.0)	1.00	
Previous surgery on genital tract				
Yes	15 (12.5)	4 (1.7)	8.29 [2.69-25.6]	<0.001
No	105 (87.5)	232 (98.3)	1.00	
Previous postpartum complication				
Yes	16 (13.3)	2 (0.8)	18.00 [4.06-79.71]	<0.001
No	104 (86.7)	234 (99.2)	1.00	
Previous stillbirth				
Yes	4 (3.3)	13 (5.5)	0.59 [0.19-1.86]	0.440

Continuation of Table 4 (a): Past obstetric history

No	116 (96.7)	223 (94.5)	1.00	
Perineal injury needing repair in previous injuries				
Yes	32 (26.7)	17 (7.2)	4.68 [2.48-8.87]	<0.001
No	88 (73.3)	219 (92.8)	1.00	
Episiotomy in past delivery				
Yes	41 (34.2)	25 (10.6)	4.38 [2.50-7.67]	<0.001
No	79 (65.8)	211 (89.4)	1.00	

*OR =Odds Ratio**C.I = Confidence Interval*

Table 4 (b): Current Obstetric history

Characteristic	Perineal injury		OR [95% C.I]	p-value
	Yes N=120 n, %	No N=236 n, %		
Type of accoucheur				
Midwife	107 (89.2)	204 (86.4)	1.29 [0.65-2.56]	0.505
Resident	13 (10.8)	32 (13.6)	1.00	
Last recorded maternal weight (kg)	75.5 ±11.8	76.7 ±13.4	0.98 [0.97-0.99]	0.426
Gestational age at delivery (weeks)	39.3 ±1.7	38.2 ±2.5	1.22 [1.11-1.35]	<0.001
Induction of labour				
Yes	30 (25.0)	21 (8.9)	3.41 [1.86-6.28]	<0.001
No	90 (75.0)	215 (91.1)	1.00	
Duration of the second stage of labour (min)	13.9 ±13.2	9.6 ±4.7	1.13 [1.07-1.19]	0.001
Presentation of baby				
Cephalic	120 (100.0)	228 (96.6)	Not estimable	0.055
Breech	0 (0.0)	8 (3.8)	1.00	

OR = Crude Odds Ratio C.I = Confidence Interval

Table 5: Maternal and Neonatal Outcomes

Characteristic	Perineal injury		OR [95% C.I]	p-value
	Yes N=120	No N=236		
Estimated blood loss (EBL) (mls)	200 [200-300]	200 [150-200]	1.003 [1.001-1.004]	<0.001
Birth weight	3.17 ±0.46	2.94 ±0.61	1.001 [1.00-1.001]	<0.001
Birth weight group 1				
≥2.5kg	114 (95.0)	194 (82.2)	4.11 [1.70-9.98]	0.001
<2.5kg	6 (5.0)	42 (17.8)	1.00	
Birth weight group 2				
≥4.0 kg	4 (3.3)	7 (3.0)	4.00 [0.64-22.04]	0.057
2.5-3.9 kg	110 (91.7)	187 (79.2)	4.12 [1.66-12.20]	0.001
<2.5 kg	6 (5.0)	42 (17.8)	1.00	
APGAR 1 min				
1-3	2 (1.7)	10 (4.2)	0.40 [0.04-1.89]	0.214
4-6	22 (18.3)	39 (16.5)	0.60 [0.14-2.01]	0.377
7-10	96 (80.0)	187 (79.2)	1.00	
APGAR 5 min				
1-3	1 (0.8)	4 (1.7)	0.48 [0.01-4.89]	0.500
4-6	4 (3.3)	13 (5.5)	0.59 [0.14-1.96]	0.354

Continuation of Table 5: Maternal and Neonatal Outcomes

7-10	115 (95.8)	219 (92.8)	1.00	
Head circumference of the baby (cm)	33.3 ±2.0	32.1 ±1.7	1.31 [1.20-1.43]	<0.001
NICU admission				
Yes	15 (12.5)	36 (15.3)	0.79 [0.42-1.52]	0.526
No	105 (87.5)	200 (84.7)	1.00	
Duration of admission(days)	3 (2-3)	2 (2-3)	0.82 [0.68-0.98]	0.852

OR =Odds Ratio C.I = Confidence Interval

Table 6: Morbidities associated with perineal injuries

Characteristic	Perineal injury		OR [95% C.I]	p-value
	Yes N=120 n, %	No N=236 n, %		
Perineal pain postpartum				
Severe (7-10 NRS)	11 (9.2)	2 (0.8)	13.75 [2.82-129.89]	<0.001
Moderate (5-6 NRS)	55 (45.8)	99 (41.9)	1.39 [0.86-2.25]	0.158
Mild (0-4 NRS)	54 (45.0)	135 (57.2)	1.00	
Episiotomy				
Yes	47 (39.2)	31 (13.1)	4.26 [2.52-7.21]	<0.001
No	73 (60.8)	205 (86.9)	1.00	
Vacuum delivery				
Yes	7 (5.8)	3 (1.3)	4.81 [1.22-18.9]	0.014
No	113 (94.2)	233 (98.7)	1.00	
Sphincter tone assessment at rectal examination				
Good	60 (50.0)	100 (42.4)	1.53 [0.94-2.49]	0.069
Poor/Bad	1 (0.8)	0 (0.0)	Not estimable	0.113
Satisfactory	10 (8.4)	11 (4.7)	2.32 [0.82-6.42]	0.067
Very good	49 (40.8)	125 (53.0)	1.00	

OR = Odds Ratio, C.I = Confidence Interval

Discussion

Overall perineal injury incidence among women who had a vaginal delivery at the KBTH during the study period was 12.66%. This incidence of 12.66% was higher than what was reported in Nigeria (9.1%)(Njoku C, 2015;), Pakistan (5.1%)(Baghestan et al., 2010), Brazil (0.9%) (Artieta-Pinedo et al., 2017), UK (0.1% - 10.2%)(Zimmo et al., 2017). It was; however, lower than South Africa (16.2%) (Naidoo and Moodley, 2015). The incidence was however comparable to India (12.4%) (Jensen et al., 2017) and UK (12.9%) (Smith et al., 2013). The incidence in this study did not differ much from that found in India. India is a developing country and may have similar environmental factors compared to Ghana where this study was conducted. This varied incidence in obstetric perineal injury may be attributed to differences in management patterns during delivery in these settings as well as different patient characteristics.

The relatively low incidence of 9.1% in the Nigerian study compared to the 12.66% in the index

study could be as a result of the long period of data collection (Njoku C, 2015;), the methodology used (retrospective in the Nigerian compared to the prospective in the Ghana) mode of delivery and patient characteristics for the Nigerian study. The index study was a prospective observational study done over a two-month period compared to the retrospective study done between 2009 and 2014 in Nigeria.

The KBTH is a national quaternary referral teaching hospital with adequate experienced trained personnel coupled with modern facilities which provide first class delivery services. This may account for the observed incidence in comparison to rates in other parts of the West African sub-region.

Goldberg and his colleagues reported the following as incidence for major degree perineal injury: 4.3% in whites; 2.0% in blacks; 9.1% among Asians; and 3.4% Hispanics (Goldberg et al., 2003). The low incidence of major degree injury in blacks compared to other populations may suggest differences in pelvic floor anatomy and function between different population

groups (Goldberg et al., 2003). The incidence of major degree perineal injuries (3rd and 4th degree OPI) 0.56% in the current study did not differ much from the 0.1% in Uganda, 1.4% in Japan, and 0.1% in China as reported by Hirayama and colleagues (Chikazawa et al., 2016). It is low compared to studies from South Africa (4.1%)(Naidoo and Moodley, 2015), Michigan USA had earlier reported 64.4% second degree, 28.8% third degree, and 6.8% fourth-degree lacerations (Artieta-Pinedo et al., 2017), whilst a study in Britain recorded an incidence of 1.58% for both third and fourth-degree injury (Eskandar and Shet, 2009). Low incidence of major degree perineal injury in this study could be as a result of the small numbers and the duration of the study as well as the methodology used. The most common perineal injury type observed among participants in our study was first-degree injury similar to what was earlier reported in Zaire and Nigeria (Naidoo and Moodley, 2015, Garba I, 2016). These first-degree injuries are generally minor and self-limiting that requires no suturing.

A study by Njoku in Nigeria found anaemia was a major complication of lower genital tract injury (Njoku C, 2015;). The severity of genital tract injury is directly related to the degree of haemorrhage/anaemia. However, in the index study, the incidence of anaemia was low in women with perineal injury. It is possible that anaemia patients in labour had more perineal protection/more attention in the second stage of labour compared with those without anaemia. Other reasons may be due to differences in methods and patient characteristics. The finding of primiparity being associated with a decreased odd of perineal injury is inconsistent with literature where primiparity was found to increase the odds of perineal injury (Kudish et al., 2008). Parity of two to four was associated with an increased odds of developing perineal injuries in our study which is inconsistent with literature where primiparity was found to increase the odds of perineal injury (Kudish et al., 2008).

Previous medical history of surgery on the genital tract, postpartum complication, perineal injuries needing repair, episiotomy, gestational age at delivery, duration of second stage of labour and induction of labour were observed in our study to be significantly associated with perineal injuries and these factors have also been reported in other studies (Carroll et al., 2003, Pergialiotis et al., 2014, Naidoo and Moodley, 2015). These may be due to repeated injury along previous injuries, an extension of such injuries and poor healing of past perineal injuries. Average gestational ages for women who had perineal injuries were slightly higher than those who had no injuries which may be due to an increase in fetal weight as the pregnancy advances, presentation/position of the fetus in labour or other patient characteristics (Smith et al., 2013, Jango et al., 2016). Similarly, in our study, women who spent longer average duration in the second stage of labour were at an increased odd of developing a perineal injury

compared to those who spent less time in the second stage (Garretto et al., 2016, Garmi et al., 2016) which may be due to pressure necrosis of the presenting part, use of episiotomy, use of manipulative procedures and the use of vacuum for some second stage delivery.

Mothers with babies with larger average head circumferences developed perineal injuries compared to those with babies with smaller mean head circumferences and this was statistically significant. Larger head circumference was a risk factor to perineal injury which was consistent with other studies (Baghestan et al., 2010, Jiang et al., 2017).

Episiotomy as a risk factor to perineal injury in our study was consistent with findings from other studies (Carroll et al., 2003, Stephansson et al., 2016). The high rate of episiotomy observed in this study is worrying, since it is linked to increased risk and development of perineal injury (Pergialiotis et al., 2014).

Conclusion

The incidence of perineal injury among women who had vaginal delivery at the KBTH maternity during the study period (12.66%) is high compared to other studies from the West African Sub-region. Risk factors such as previous postpartum complication, episiotomy, and gestational age at delivery, head circumference of the baby, asthma, hypertension and past genital tract surgery significantly associated with perineal injury. Early identification of women at risk of perineal injury could help with interventions to reduce the incidence of this complication during childbirth.

Authors' contributions

CT originated the study and contributed to drafting of manuscript. AS, KM and JDS coordinated all aspects of study implementation and contributed to data interpretation and drafting of manuscript. CT performed literature search, developed data collection instrument, assisted with recruiting participants and reviewing manuscript. WK analysed data, contributed to interpretation of results and drafting of the manuscript. All authors reviewed and approved the final draft of this manuscript.

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Conflict of interest

The authors declare that they have no competing interests

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LESSONS LEARNED OF THE FIRST PUBLIC SECTOR ISO 15189 ACCREDITED LABORATORY IN GHANA

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Abstract

Background: Accreditation of public sector medical laboratories in developing countries such as Ghana have been described as an almost impossible task despite major efforts to establish and maintain efficient quality laboratory management systems. The Pathology Division of the 37 Military Hospital provides evidence of an efficient approach to accreditation to ISO 15189 in Ghana and the need to make medical laboratory accreditation an integral part of the national healthcare delivery system.

Methods: The laboratory adopted the Strengthening Laboratory Management Towards Accreditation (SLMTA) programme. After implementation the laboratory accelerated the process towards accreditation using an approach involving senior management in all accreditation activities, use of specific teams to focus on key improvement projects coordinated by an efficient mentorship programme.

The laboratory was finally assessed by the Southern African Development Community for Accreditation Services to meeting the requirement of ISO 15189.

Results: The Pathology Division of the 37 Military Hospital attained accreditation for its Haematology and Chemical Pathology departments making it the first public sector laboratory in Ghana to meet the requirement of ISO 15189. There has been an observed improvement in confidence of personnel and a culture for quality and meeting standards in support of quality healthcare delivery.

Conclusion: ISO 15189 accreditation of medical laboratories is possible for all public sector laboratories in Ghana and the approach is scalable especially for tertiary level laboratories. Accreditation ensures a culture for quality which is critical in support of quality patient care and must be an important aspect of national healthcare delivery systems.

Key Words: Accreditation, Laboratory, LQMS, Quality, ISO 15189

Introduction

Medical laboratories in Ghana and the world over are an essential component in the diagnosis, treatment and management of patients making reliable laboratory services, key to any efficient healthcare delivery system.^{1,2} It is therefore quite unfortunate to observe that, in most parts of Africa, medical laboratory test results are generally distrusted for their accuracy and reliability. In the United States of America alone an estimated 94% of patient treatment and diagnosis are based on laboratory data.³ The difficulty to accreditation of laboratories can be said to be highly influenced by the lack of prioritization of accreditation, inadequate allocation of resources for attaining and maintaining accreditation, poor understanding of the importance of accreditation by both laboratory personnel and health authorities and the high cost of the accreditation process.

In 2010 it was estimated that out of 380 laboratories accredited to international standards in sub-Saharan

Africa, 91% (approx. 346) are in South Africa. Thirty-eight (38) out of the 49 countries evaluated, which included Ghana at the time had no laboratory accredited to any international quality standard.⁴ In Ghana, there are an estimated 500 medical laboratories across the entire tier of healthcare service delivery in the public sector and yet not one of these is known to be accredited to any standard, local or international^{4,5}.

Implementation of SLMTA (Strengthening Laboratory Management Towards Accreditation) in Ghana started in 2010 with support from the US-Centres for Disease Control and Prevention under US-PEPFAR (United States President's Emergency Plan for AIDS Relief). In 2013, the Pathology Division with support from United States - Deployment Health Assessment Programme (US-DHAP) supported by the Jhpiego-Ghana was enrolled onto the SLMTA programme. Between 2010 and 2015, 15 laboratories including the Pathology Division of the 37 Military Hospital, grouped in three cohorts had been enrolled onto the programme⁵. Each facility benefitted from mentorship and logistics support over an eighteen-month period.

Until recently, the thought of a public sector medical laboratory meeting the requirement of ISO 15189 (medical laboratories: minimum requirement for quality and competence) and receiving accreditation was severely met with mixed feelings in Ghana. This article describes the experiences of the Pathology

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Division of the 37 Military Hospital in attaining and maintaining its laboratory accreditation status and the observed effect it has had on laboratory activities. It also presents an approach which is achievable and scalable in all medical laboratories. Furthermore, it describes the need to make accreditation of medical laboratories more relevant in particular tertiary level medical laboratories in Ghana.

Methods

Setting

The 37 Military Hospital is a 400 bed specialist hospital located on the Liberation Road between Kotoka International Airport and Central Accra. It is one of the largest hospitals in the Republic of Ghana after the Korle-Bu Teaching Hospital.⁶ It is the main clinical laboratory service provider for staff of the Ghana Armed Forces (GAF) and the general public. The laboratory operates the Haematology and Chemical Pathology departments in addition to other departments such as Microbiology, Histopathology and Serology, and a Blood Transfusion Service.

Ethical Considerations

We used data from the laboratory's quality management system. No patient information was used. Therefore no ethical review was required for this article.

Baseline Assessment and Accreditation Process Initiation

The laboratory quality improvement process of the Pathology Division started in February 2013 when it was selected with 4 other public sector laboratories to form the third cohort of SLMTA laboratories in Ghana. Implementers of the SLMTA programme in Ghana, Global Health Systems Solutions (GHSS), utilized the Stepwise Laboratory Quality Improvement Process Towards Accreditation (SLIPTA) checklist to identify gaps and opportunities for improvement and to measure progress based on the zero to five star grading system^{7,8}.

Nonconformities identified during the assessment included; inadequate knowledge on the ISO standard and laboratory quality management systems, lack of staff training programme, poor quality control systems, lack of method validation/verification system among others.

Developing the Quality System: Management Commitment

At the helm of affairs was a structured laboratory management team which had the sole responsibility of supervising and ensuring that the Laboratory Quality Management System (LQMS) was duly implemented and maintained. Specific roles were defined for the laboratory manager, quality manager and laboratory director which were otherwise not clearly documented.

Hospital management initiated monthly meetings with laboratory management to discuss the quality improvement process and the progress to accreditation.

At these meetings, quality indicators, improvement projects, outcomes of assessments were discussed; gaps were identified and opportunities for improvement were uncovered. Hospital management was therefore very much informed and conscious of the quality requirement of the laboratory, the ISO standard and the accreditation process.

Developing the Quality System: Team Formation

To ensure the effective implementation of the quality process new appointments were created by laboratory management. These appointments included; Logistics Officers, Health and Safety Officers, Training and Development Officers and Quality Officers. These officers with the Quality Manager constituted the Quality Steering Committee (QSC). The QSC had the sole responsibility of monitoring the LQMS, coordinating and advising laboratory management as appropriate.

During the implementation process seven (7) specific teams were also formed; audit team, document review team, equipment maintenance team, method validation/verification team, quality control team, external quality assessment (EQA) team and client satisfaction team. Each of these teams with a team leader, had the responsibility of ensuring that the laboratory was meeting set goals defined by the QSC and the LQMS. To ensure closer monitoring of team activities, the teams provided regular reports to the QSC and to laboratory management.

Developing and Maintaining the Quality System: Mentorship

An in-country resident mentor from GHSS-Ghana was assigned to the laboratory to provide guidance and coordinate the activities of the quality system while providing the needed technical support. The facility-based embedded mentorship programme design, ensured continuous training for both technical and management personnel including one-on-one coaching. Some areas of training included; internal audit, quality control, specimen management, safety among others. It also ensured laboratory staff personally carried out most tasks to build their capacity in performing assignments and making the quality process sustainable.

The mentorship programme guided the development of policies, processes and procedures; development of quality control programmes, laboratory training programmes, audit programmes, safety programmes, equipment and inventory management programme and management review processes.

Quality Indicators

The laboratory used quality indicators to measure the strength and performance of its quality system. These quality indicators included; Turnaround Time (TAT), specimen rejection and external quality assessment (EQA). TAT measured the time between specimen receipt by the laboratory until result validation. Specimen rejection measured the ratio of

specimen rejected to the total samples received per year. EQA performance measured the ratio of the acceptable results to the total number of tests run for a given EQA sample. Targets that were set for each indicator were; 90% TAT compliance (number of samples within acceptable TATs of 5hours) per month, less than 20 specimen rejections per month and 90% EQA performance pass rate. All quality indicators were monitored and reviewed by the QSC and laboratory management. Number of specimen rejections and turnaround times were collected and analysed on Microsoft excel. Recorded data was double checked and cleaned to ensure data quality.

Non-conforming events

Following the Non-conforming events (NCEs) identified by the Accrediting Body (AB), laboratory management through the laboratory quality steering committee ensured the investigation of each NCE to identify the root cause. Upon identification of the root cause, action plans were developed for elimination by way of corrective action. Plans were also developed and monitored to prevent recurrence of the identified NCEs.

Results

External Quality Assessment (EQA)

The outcomes of Chemistry EQA runs after 26 runs recorded an average of 89% pass rate whereas Haematology recorded 88% after 21 run (table 1). The laboratory commenced preparations towards its accreditation in 2016. Performance target score was 80% in 2016 and 2017 and was increased to 90% in 2018.

Table 1: EQA performance for Haematology and Chemical Pathology (2014 to 2018).

	2014 (%)	2015 (%)	2016 (%)	2017 (%)	2018 (%)
Chemical Pathology	74	80	84	80	89
Haematology	82	67	71	87	88

Specimen Rejection

The laboratory recorded a specimen rejection rate of 0.28% in the years 2017 (69,295 sample runs) and 2018 (80,272 sample runs) in Haematology. Rejection rate in Chemical Pathology was 0.14% (n=56,518) in 2017 and 0.20% (76,195) in 2018.

Turnaround Time (TAT)

The turnaround time (figures 2 & 3) for Haematology and Chemical Pathology recorded gradual improvements from 56% to 92% and 63% to 85% respectively from August 2018 to January 2019.

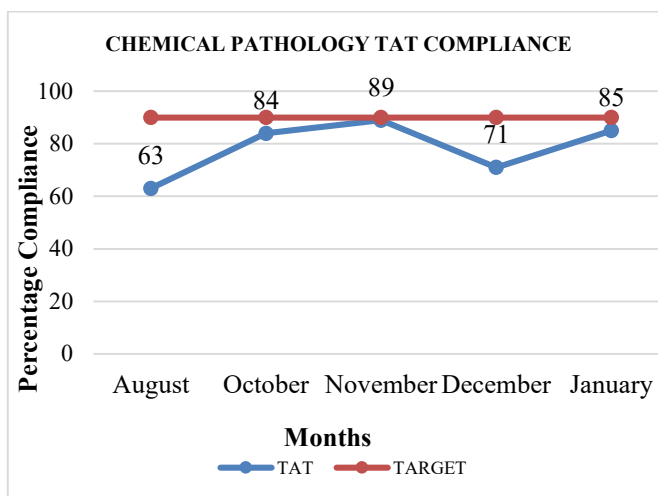


Fig. 2 Turnaround Times (TAT) for Chemistry tests monitored from August 2018 to January 2019. Percentage compliance was measured as the ratio of the number of test results sampled which were completed within laboratory stated TAT to the total number of tests sampled.

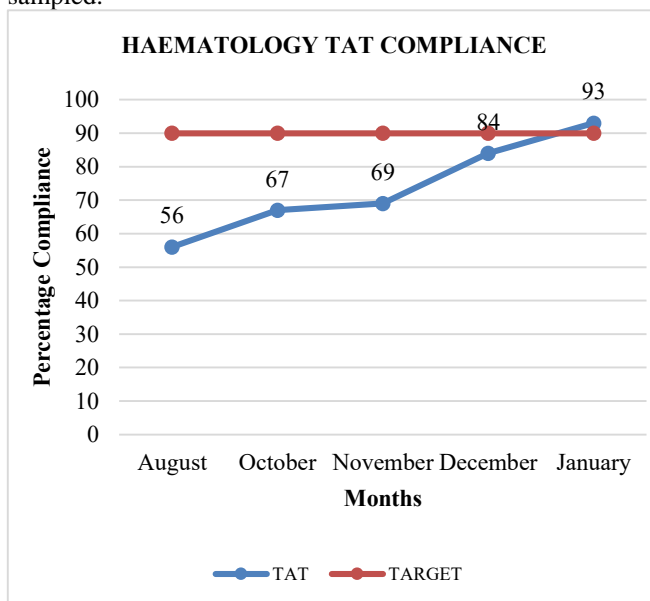


Fig. 3: Turnaround Times (TAT) for Full Blood Count test in Haematology.

Non-conforming Events

The number of non-conformities significantly dropped from 30 at the initial accreditation assessment in 2017 to nine at the first accreditation surveillance assessment in 2018.

Accreditation

The laboratory was accredited to ISO 15189 by the Southern African Community for Accreditation Services (SADCAS) with registration number MED019.

Maintaining Accreditation

Consistent, complete and comprehensive technical and management reviews were a critical contribution to the maintenance of the accreditation process. These reviews were otherwise ineffective prior to the accreditation acquisition. A Quality Assurance Office was established to support the management of the quality system. The effective commitment to the maintenance of the quality system is evidenced in the significant drop in the number of non-conformities at the surveillance assessment and the maintenance of its accreditation status.

Discussion

High quality laboratory testing is critical for patient care, disease prevention and disease surveillance.⁹ Although the majority of laboratory testing are done in public sector laboratories, no medical laboratory in the public sector in Ghana had been accredited to ISO 15189^{4,5}.

The journey to accreditation was met with several challenges which required intense commitment and effort. The use of teams offered the opportunity for more personnel to be involved in the quality improvement process. Collective involvement therefore proved to be an effective tool in the change process¹⁰. This helped to eliminate the erroneous notion that the change process was “someone else’s job”.

At the core of the quality improvement process and accreditation was an effective mentorship program. The effective use and impact of mentorship on the accreditation process can also be seen in the experience of Bugando Medical Centre Clinical Laboratory-Mwanza Tanzania¹. Contrary to their method however, where external Clinical Laboratory Standards Institute (CLSI) mentors were used, the Pathology Division used an in-country mentor in the establishment of their quality system and the attainment of ISO accreditation. This is clear evidence of how countries like Ghana have the capacity to establish and technically support their own laboratory quality management system.

The outcomes of EQA for Chemical Pathology tests increased from 74% before accreditation to 89% after accreditation acquisition. Haematology also saw significant increases from 67% to 88% before and after accreditation respectively. The consistent increases in EQA scores is associated to the critical attention; quality control, equipment servicing, maintenance and personnel competence, given to testing procedures. The drop in performance in Chemical Pathology was due to changes in test units which was undetected. This was however identified and corrected resulting in the recovery of better scores. Annual specimen rejection rates was below 0.5% for 2017 and 2018. The number of samples rejected however saw increases as the laboratory further strengthened its specimen acceptance and rejection criteria. The laboratory did not only strengthen its specimen acceptance and rejection criteria, but also met with its clients to explain and train

them on the specimen requirement for testing in the laboratory. The laboratory further provided sample requirement guidelines to all wards and emergency units to inform the choice of samples for laboratory testing and its associated requirement in improving sample rejection. Turnaround Time in Haematology showed gradual increases from 58% compliance in August 2018 to 93% in January 2019. Chemical Pathology also showed improvement in TAT from 63% compliance in August 2018 to 83% in January 2019. The observed drop in TAT compliance for Chemical Pathology in December 2017 was associated with ongoing equipment maintenance procedures.

It was evidenced in the implementation that, management commitment is critical at two levels in public sector laboratories: hospital management and laboratory management. This form of commitment is consistent with the published work of Viegas et al (2017) who described institutional commitment, staff motivation, strong laboratory leadership, adequate infrastructure and a comprehensive action as key pillars to accreditation acquisition. Medical laboratory accreditation should form part of a national agenda, particularly in Ghana, to ensure that the medical laboratory, a key aspect of diagnostics, is supported to offer the most accurate and reliable outcomes for efficient patient management.

Conclusion

The attainment of ISO accreditation in the public sector medical laboratory in Ghana is a possibility. Using the SLMTA programme and the SLIPTA approach coupled with management commitment, team work and efficient mentorship, more laboratories can attain accreditation and increase the quality of laboratory service delivery in Ghana and in Africa. Laboratory accreditation must be a national agenda for all countries, especially Ghana, particularly all national and regional level facilities.

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CHALLENGES OF OUTBREAK INVESTIGATION IN RESORT SETTINGS: A CASE OF FOODBORNE ILLNESS AMONG HOTEL CONFERENCE ATTENDEES IN URBAN GHANA

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Summary

Background: Foodborne illness is of major public health concern. Identifying foodborne outbreaks in resort settings among short-stay travelers is complex, as these persons often leave ill and seek medical care at home.

Objective: We report an outbreak investigation of diarrhoeal illness among attendees of a lunch banquet held for conference participants in a 'first class' hotel in Takoradi, Ghana.

Method: A case was defined as three or more loose stools within 24 hours occurring after 15 hours GMT of 26th November, 2018 to 28th November, 2018. A full list of food items and ingredients served at the banquet was reviewed with the participants using a questionnaire. A retrospective cohort study was then conducted.

Results: A total of 49 attendees (all females) were present at the conference and 44 (90%) participated in the banquet. Approximately 36% (16) had illness that met the case definition and none of the five who were absent during the banquet developed illness. Vegetable salad was the most likely source of illness (RR= 2.33; 95% CI: 1.16-4.69; p < 0.034).

Conclusion: Although 'first class' hotels may have high sanitary standards; contamination of food may still occur. The short incubation period, mild and self-limiting nature of the illness suggest *Staphylococcus aureus* preformed toxins as the cause. Environmental and laboratory investigations were not carried out due to late notification, low laboratory capacity and bureaucratic challenges at the site.

Key Words: *Staphylococcus aureus* enterotoxin, Foodborne illness, First class hotel, Banquet

Introduction

Foodborne illness is of major public health concern. One of its main manifestations - diarrhoea usually resolves spontaneously although may interfere with carefully planned expedition. The term travelers' diarrhoea has been used to describe acute gastroenteritis experienced by individuals during journeys to destinations outside home.¹ Post-process contamination from factory or kitchen environment is a very common means by which commercially processed foods are contaminated.^{2,3} Data on foodborne illness are often sketchy. In 2010, 600 million foodborne illnesses occurred globally with highest per population burden occurring in Africa where more than 91 million cases with 137,000 deaths occur annually.³

Foodborne illnesses can be caused by bacteria, viruses, protozoa, helminthes and chemical agents.⁴ Microorganisms cause diarrhoea by either direct invasion of the gastrointestinal tract or through production of toxins.³ Toxigenic microbes produce heat resistant pre-formed toxins in food and incubation

period can be as little as 1 hour as in the case of *Staphylococcus aureus* enterotoxin.^{2,3} Pre-formed toxins from other microbes such as *Bacillus cereus* and *Clostridium botulinum* may take 8-16 hours and 12-72 hours respectively to produce symptoms.^{2,3} In contrast, non-toxin producing agents have to enter the host, colonize and invade tissues before producing illness and it can take at least 8 hours for onset of illness.²

Identifying foodborne outbreaks in resort settings among short-stay travelers is complex, as these persons often leave ill and seek medical care at home. Again, it is even more challenging in situations where illness is self-limiting. Investigation of disease outbreaks may require collaboration; interaction of several departments to identify the outbreak source, determine its etiology, and implement control efforts to interrupt transmission.^{1,5}

Isolating offending pathogens require wide range of tests which are often not available due to low laboratory capacity especially under resource-constraint settings.^{5,6} Investigators may have to rely on clinical presentation and epidemiological characteristics in arriving at diagnoses.^{5,7,8} In a foodborne outbreak investigation among hajj pilgrims camped in a hotel in Jeddah, Al-Abdullah (2019) found that chicken served at lunch was contaminated with *Staphylococcus aureus* enterotoxin based on clinical presentation as laboratory findings were inconclusive.⁷ In another outbreak investigation,

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Monini et al (2019) could not identify the source of the two episodes of Norovirus gastroenteritis outbreak occurring within one week in a cafeteria due to operational challenges.⁸

In Ghana, these challenges are aggravated by the absence of an effective foodborne disease surveillance system.⁶ The integration of surveillance systems at the operational level; though commendable, has a potential of missing small outbreaks especially if illness is self-limiting. Even when reported, capacity of the local health officials to perform the initial critical steps in the response path is often lacking.

We report an outbreak investigation of diarrhoeal illness among attendees of a lunch banquet held for conference participants in a ‘first class’ hotel in urban Ghana; bringing to fore the challenges and suggested remedial actions.

Methods

Background

A three-day training conference was held for 49 participants in the Western Region of Ghana from 26th to 28th November, 2018. The venue was a ‘first class’ hotel with over 100 guest rooms and en-suite facilities. Participants were accommodated and provided meals including breakfast, buffet banquet for lunch and two sets of snacks. Meals were prepared and served by the restaurant staffs.

On the second day of conference, some participants complained of passing watery stools since 21:00 GMT the previous day. One of the conference facilitators informed a resident Physician at the Faculty of Public Health of Ghana College of Physicians and Surgeons (FPH-GCPS) and a team was dispatched the next day to investigate the outbreak.

The hotel manager was contacted prior to the visit and voluntary informed consent was sought from all respondents. This outbreak was deemed a response to public health emergency by the College and Ghana Health Service and hence did not receive formal review by Ethical Review Committees. Confidentiality was observed throughout the investigation and the report was shared with the hotel management, the College and Ghana Health Service.

Epidemiologic Investigation

Hypothesis-generating interviews with five participants who experienced gastroenteritis indicated that the 26th November banquet was the likely source of the outbreak. No other common exposures were reported; the participants did not visit animal facilities, report animal contact or purchase food and drinks from outside. Focusing on the 26th November banquet; a full list of food items and ingredients served at the banquet was reviewed with the participants using a questionnaire. All attendees of the conference were asked to indicate when they arrived in the city and whether they experienced diarrhoeal illness. A case was defined as three or more loose stools within 24 hours

occurring after 15 hours GMT of 26th November, 2018 to 28th November, 2018. If diarrhoea was reported, the respondent was asked whether she had other symptoms and if they had participated in the 26th November banquet. A recall of food items consumed was documented. Information about sex, age, onset and nature of symptoms, and duration of illness were collected. From these data, the main symptoms and the time of onset were analyzed to determine the possible causes of the outbreak and to draw the epidemic curve.

A retrospective cohort study was then conducted: the questionnaire responses were entered into a database, analyzed with Stata statistical software (Stata Intercooled version 12; Stata Corp, College Station, TX, USA) and the specific attack rate (AR) was calculated for each type of food served at the banquet. To measure the association between the food served and the illness symptoms, estimates of the risk ratio (RR) with a 95% confidence interval for each food item were calculated. A p-value less than 0.05 were considered statistically significant.

Laboratory and Environmental Inspection

We carried out hygiene inspection of the restaurant and sanitary facilities. The restaurant manager was interviewed on source of groceries especially fresh vegetables, the processing as well as handling of banquet dishes. However, samples were not taken for laboratory analysis due to unavailability and low capacity.

Results

Epidemiological and Clinical Characteristics of Cases

A total of 49 attendees (all females) were present at the conference and 44 (90%) participated in the banquet. More than half (56.8%) of the participants were below 35 years (Table 1). The mean age was 33.5 years (SD=4.3; Range= 25-47; Median=33.5; Q₁=30.5; Q₃=36.0; Mode=36.0). Approximately 36% (16) had illness that met the case definition and the mean age was 33.1years (SD= 4.1; Range= 25-40; Median=33.0; Q₁=29.5; Q₃=36.5; Mode=29.0). None of the five who were absent during the banquet developed illness. There was no statistical difference in age between ill and well respondents.

Table 1: Age distribution of banquet attendees, November 2018; Takoradi, Ghana

Age Group	Frequency	Percentage	Cumulative Frequency
25-29	8	18.2	18.2
30-34	17	38.6	56.8
35+	19	43.2	100.0

The banquet started at 14:00 and ended at 15:00 GMT. No packaging of food for later consumption was allowed. A case (arrowed on figure 1) that did not meet the case definition was excluded in the analysis. The first

case developed illness 3 hours after the banquet with peaking of cases at 6 hours post-banquet. The last case occurred 18 hours post-banquet (Figure 1). Symptoms included abdominal pain (19%) and diarrhoea (81%). All participants with diarrhoea also complained of abdominal pain. No fever, nausea, vomiting,

disorientation, weakness, myalgia, bloody stool and other constitutional symptoms were recorded. Median incubation period was 7 hours; the median duration of illness was 13 hours and all respondents were treated on outpatient basis at a local health post.

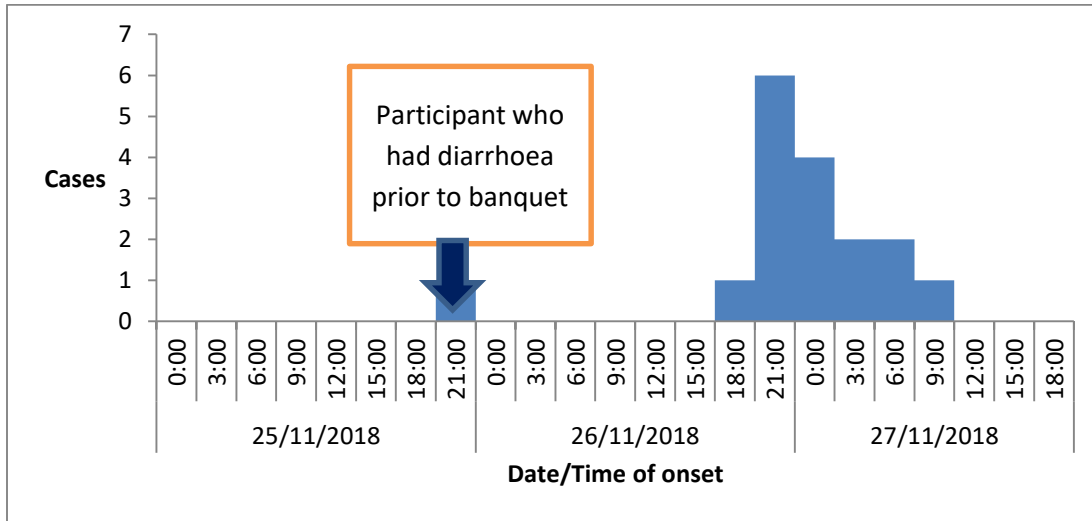


Figure 1: Cases of diarrhoeal illness by date of onset, November 2018; Takoradi, Ghana

Laboratory and Environmental Inspection

The hotel sources fresh vegetables from farmers through agents. The banquet dishes were prepared and served by separate teams of restaurant staff. The general sanitation in the restaurant and adjoining facilities was good. Soap, running water and disposable towels were available at the toilets. The restaurant had cutleries wrapped in napkins and arranged neatly. It also had a small hand washing sink hanging in obscurity in an extreme corner of the hall. However, we were denied access to the kitchen because the hotel manager was not available at the time of arrival and he could not be reached via telephone. Information on health status of staff, periodic medical screening, housekeeping and record of foodborne illnesses among guests could not be accessed for same reason. Follow up attempts for answers proved futile. The investigation team was

alerted more than 24 hours after the banquet and the restaurant had been cleared, hence samples could not be taken for laboratory investigation. Again, majority of the cases (13 out of 16) had symptoms resolved at the time of investigation and the few that were still symptomatic could not produce stool samples because the conference had ended and were departing.

Attack Rate

Calculation of AR and RR of food items consumed at the banquet pointed to vegetable salad as the most likely source of the outbreak: the AR for persons who ate vegetables was 66.67% with RR of 2.33 (95% CI: 1.16-4.69; $p < 0.034$; Table 1). It was prepared from lettuce, tomatoes, carrot, cucumber, baked beans, eggs and cream.

Table 2: Food-specific attack rates (AR) and risk ratios (RR), November, 2018; Takoradi, Ghana

Food Item	ATE SPECIFIED FOOD			DID NOT EAT SPECIFIED FOOD			Risk Ratio	P
	Total	Cases	AR %	Total	Cases	AR %		
Vegetables	9	6	66.67	35	10	28.57	2.33[1.66-4.69]	0.034
Beef sauce	8	5	62.50	36	11	30.56	2.05[0.99-4.24]	0.089
Tilapia	13	6	46.15	31	10	32.26	1.43[0.66-3.11]	0.382
Plain rice	11	5	45.45	33	11	33.33	1.36[0.61-3.06]	0.469
Goat soup	12	4	33.33	32	12	37.50	0.89[0.36-2.22]	0.798
Spaghetti rice	11	4	36.36	33	12	36.36	1.00[0.41-2.47]	1.000

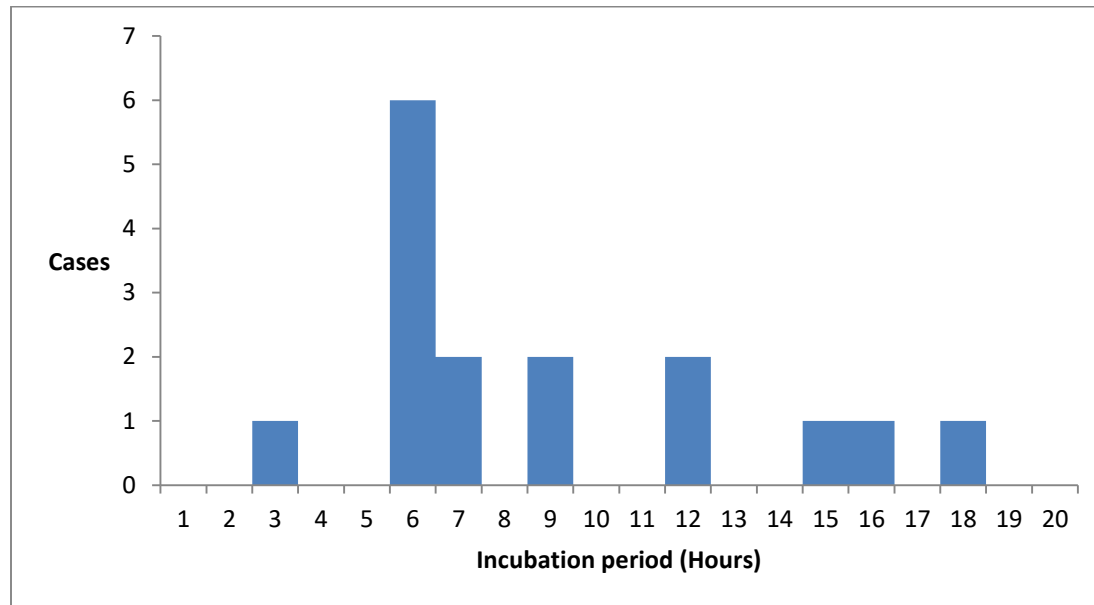


Figure 2: Cases of diarrhoeal illness by incubation period, November 2018; Takoradi, Ghana

Discussion

The epidemiologic investigation demonstrated that illness was associated with attending the banquet on 26th November. None of the five attendees who abstained developed diarrhoeal illness. The outbreak was linked to the consumption of vegetable salad. Salads have often been implicated in foodborne outbreaks at banquets and resorts^{1,9,10} probably because of its constituents and method of preparation. Pathogens introduced at any point multiply rapidly due to high protein content especially if allowed to sit for a long while before consumption. Although the vegetable salad looked fresh, it does not rule out contamination.¹¹

Epidemiologically, the clinical features of sudden onset of diarrhoea and abdominal pain; short incubation period (Median= 7 hours, Range= 3-18 hours); mild and self-limiting nature of the illness and association of *Staphylococcus aureus* with environment and wide range food items including vegetables suggests pre-formed toxin induced diarrhoeal illness caused by this bacteria^{2,3,12} as healthy adults are usually not susceptible to viral diarrhoea. Isolation of the aetiologic agent of this outbreak was however challenging because of the missed opportunities in the management. The association of enterotoxigenic pathogens to the outbreak was therefore based on compelling epidemiological evidence. In the absence of laboratory confirmation of aetiologic agent in food samples and clinical specimens, a thorough evaluation of epidemiological and clinical characteristics of an outbreak becomes a useful alternative. It is a golden rule in medicine that when an observed clinical picture fits a standard presentation of an identified cause, it is most likely to be the correct diagnosis.^{5,7}

The epidemic curve typically depicts a point source outbreak. The case recorded on 25th November, 2018 may be unrelated; was exposed earlier or the source of

contamination. However, the fact that attendees had no direct contact with the banquet setup because food was served solely by banquet staff trivializes possibility of the contamination from guests. The banquet staff were most likely source of contamination^{1,2,3,9,13} although none of them developed illness. As shown by the study of Monini et al (2019), asymptomatic employee may shed microbes for weeks leading to outbreaks if not identified and managed.⁸ Pathogens can remain viable on the hands and surfaces for hours or even days after initial contact.¹⁴ Gallina et al (2013), in their investigation of foodborne outbreak at a private banquet found the source of the enterotoxigenic *Staphylococcus aureus* strain contaminating the seafood salad to be one of the food handlers employed by the caterer.⁹ Nonetheless, contamination may also occur on the field. Organic fertilizers, irrigation water quality and soil are major sources.^{15,16,17} Some vegetables cultivated in the cities and peri-urban centres are irrigated with water from gutters and storm drains contaminated with faecal matter; imparting onto them harmful pathogens.^{16,17}

Generally, response to the outbreak was delayed due to late notification. The failure to obtain samples was due to low laboratory capacity and unavailability as all the cases had illness resolved at the start of investigations except three who had mild abdominal pains but could not produce stool or vomitus. As observed in the study of Shane et al (2002), outbreak investigations especially in resort settings require collaboration and cooperation from management of such facilities.¹ Objection to sanitary inspection of the kitchen raises doubts on food hygiene practices in the hotel and this is affirmed by the work of Darko et al (2017). In that study, laboratory investigations on food samples collected from randomly selected three-star hotels in Kumasi identified heavy contamination with microbes beyond WHO accepted levels.¹⁰

Limitation of the study was that environmental and laboratory investigations were not carried out to confirm offending pathogen due to reasons stated earlier. There was also a possibility of recall bias where case-patients might have recalled differently from those who were not ill. The response to this outbreak should be interpreted within the context of the limitations posed by the missed opportunities.

Conclusions

Foodborne outbreaks occur as a result of lapses in food hygiene. Although 'first class' hotels may have high sanitary standards, contamination of food may still occur. The epidemic curve indicates a point source outbreak probably caused by vegetable salad most likely contaminated with *Staphylococcus aureus* preformed toxins. Although conclusive determination of the pathogen was not carried due to low laboratory capacity and poor cooperation from the hotel management, the clinical and epidemiologic characteristics support the diagnosis.

District Health Management Teams (DHMT) should map out hospitality set ups within their catchment areas and collaborate with operators in priority health event surveillance in order to facilitate early detection and timely response. An effective foodborne disease surveillance system complemented by adequate laboratory capacity should be established at all levels of the health system to properly manage foodborne outbreaks.

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SOCIAL MEDIA LEARNING BY MEDICAL STUDENTS; CREDIBILITY EVALUATION AND THE ROLE OF EDUCATORS

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Abstract

Access to learning content on social media is expanding as users share information and institutions improve their presence. There is a gap between frequency of use by current medical students (millennials) and their educators. This study investigated these gaps and probed credibility evaluation criteria of students and the roles they expect their educators to play on social media. The Technology Acceptance Model (TAM) was used as theoretical framework for the formulation of hypotheses and research questions. Using a survey of 112 Ghanaian medical students the study measured frequency of use, perceived ease of use and perceived usefulness of social media for learning.

The criteria used by medical students to evaluate the credibility of learning content and the role they expect their educators to play on social media were ranked. Firstly, results from multiple linear regressions supported the influence of perceived ease of use and perceived usefulness on frequency of social media use for learning. Secondly, ranking of criteria used by students to evaluate the credibility of social media learning content revealed the importance of easy access, detailed information and verifiable sources. Thirdly, it was observed that medical students expect educators to play a more active role on social media by developing content and guiding student use.

Key Words: social media, medical education

Introduction

Medical education like many fields of undergraduate teaching in 2019, is dealing with millennial students who are highly knowledgeable about the internet. In contrast, most of their current educators were trained when classroom information could mostly be verified from recommended books or other practitioners. This reveals a difference between students and educators with regards to their familiarity and understanding of learning on social media. Bennett and Maton³ noted the need to research the increase in learning on social media for more understanding and anticipating of developments.

Social media can be defined as online tools that are driven by user developed content, allows users to communicate and is a product of the web 2.0 trend. This study acknowledges the existence of different forms of social media and selected specific platforms based on media popularity and suggestions by respondents. The platforms considered were YouTube, Facebook, Twitter, WhatsApp, Instagram, Snapchat, WeChat, SlideShare, LinkedIn, Pinterest and GooglePlus. According to Colbert⁴ free open-access

medical education (FOAMed) has changed healthcare education in all societies. The ease with which answers can be found to questions makes it useful for students to consult social media as a secondary source of information after regular classroom sessions. Social media learning is characterised by core activities namely, information seeking and sharing (Mills et al.⁶). Information seeking adds to their knowledge after regular classroom practice while information sharing is the contribution of content in expectation of reciprocity, recognition, enjoyment or to inform other learners. It is useful to note that medical students access information and develop content through comments, videos and interactions with other users⁴.

As noted by Hopkins¹, while current medical students have an active online presence on multiple social media platforms, experienced educators show relative skepticism. Brisson² reiterate the need for educators to improve their presence on social media to bridge the activity gap with their students. A search in literature reveals numerous studies on unprofessional conduct by medical students on social media⁸. Research is still split between the inhibitory role of social media and its developmental function with the inhibitory view producing more investigations as recalled by Cheston et al.⁹. The beneficial use of social media can be aided by the ability of students to recognize credible information based on criteria set by educators^{4,10}. Development of credibility evaluation skills with the help of instructors can mitigate the risk of learning inaccurate content¹¹. In medical education this is important because the risk of

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Conflict of Interest: None Declared

exposure to inaccurate information can affect examination performance and clinical practice⁴

In modern times students evaluate social media learning content independently while prior students had to evaluate the credibility of books¹². The edition (year), expertise of author, recommendations and satisfaction with content presentation style are a few of the many criteria used to evaluate text¹⁰. Just like a car comes with risks of road accidents, the internet also presents its own issues, an analogy used by Mandalios¹². The skill of independently evaluating content based on scientific criteria of the medical sciences is critical⁷. To provide useful insights to students, educators must be active on social media and experience information seeking and sharing¹.

The use of social media by medical students can be theoretically explained with the Technology Acceptance Model (TAM). The TAM by Davis¹³ describes the motivation of people to initiate and sustain the use of technology. This model describes technology acceptance with three components which are design features, user motivation and actual system use¹⁴. The design features and user motivation are the predictors of system use¹⁵. It names adaptation as the first indicator of acceptance and sustained use over an unlimited period as the deciding point, as recalled by Ros et al.¹⁶ and visualized in the figure below.

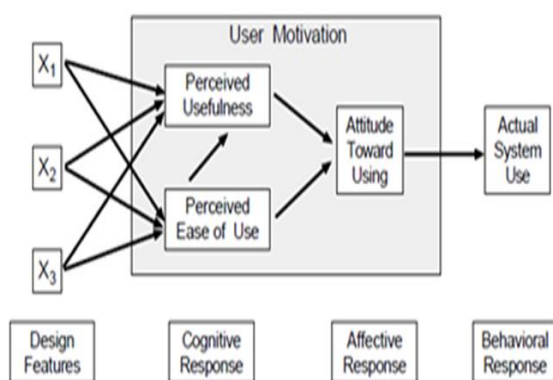


Fig. 1: The Technology Acceptance model by Davies¹³

Design features

Design features refer to the functionalities of the technology including advantages over existing ways of learning¹⁴. In our context, these features refer to the advantages of social media over typical instructor led classroom teaching and libraries. These are community membership, unrestricted access to community information, two-way flat hierarchy interaction, easy content development amongst others¹⁷. Students will use these if they formulate positive perceptions¹⁵ as described by the second component of the TAM known as user motivation.

To use technology, motivation should lead to an attitude which is determined by the usefulness (*PU*) and ease of use (*PEU*) perceptions of the individual¹⁵. *Perceived ease of use* (*PEU*) is defined as the degree to

which using the platform is free of effort¹⁴. *Perceived usefulness* (*PU*) is defined by Edmunds et al.¹⁷ as the degree to which using the system improves performance. These perceptions (*PU* and *PEU*) determine the degree to which students engage in self-directed social media learning and the level to which such behavior is sustained¹⁷. This motivation is a cognitive and affective response to the technology and leads to actual system use¹⁶.

Actual system use refers to the repeated utilization of a technology to achieve personal goals over a non-defined period¹⁷. This occurs if the system helps students reach their learning goals and is predicted to help over the course of their studies¹⁵. This acceptance is demonstrated by the active search for information on social media and contribution to discussions or content development, as described by Stantchev et al.¹⁴.

Using the Technology acceptance model¹³ as theoretical backing, we investigated social media learning practices of medical students after regular medical school classroom sessions, as listed below:

1. The role of medical students' perceptions of ease of use and usefulness on frequency of social media learning
2. The criteria used by medical students to evaluate the credibility of social media learning content
3. The roles medical students want their educators to play on social media.

We hypothesized that;

1. Medical students' **perceived ease of use** predicts their **use of social media** for learning.
2. Medical students' **perceived usefulness** predicts their **use of social media** for learning.

Research Questions

1. How do medical students evaluate the credibility of learning content on social media?
2. What role do medical students want their educators to play on social media?

Method

Sample and study design

All medical students in the clinical year who were willing to participate in the study were selected. A sample of 112 medical students aged between 20-30 ($M = 23.6$, $SD = 2.03$) made up of 62 females and 47 males of a Ghanaian University participated in the study. Using a survey, questionnaires were distributed to students during regular medical school classes. The items are described in the next sub-section.

Instruments

Social media was operationally defined as 'online communities that allow two-way communication between users, posting/sharing of content, comments from users and multimedia representation of content (text, video etc.)'. Learning was defined as 'accessing content addressing topics from your current medical training. These include articles, videos, audios about procedures/topics, interactions with others about such

topics and information you share.’. Cronbach alpha statistics was used to measure internal consistency as recommended by Field¹⁸. Except for frequency of social media learning and demographics, all scales were presented on a 5-point likert scale ranging from ‘*Strongly Disagree*’ to ‘*Strongly Agree*’. The questionnaire measured frequency of social media use, perceived ease of use and usefulness, source evaluation by students, roles of educators and demographics, as described in the next paragraphs.

Frequency of social media use

The 8-items asked respondents about how frequently they used Facebook, Twitter, YouTube, WhatsApp and other preferred social media tools. It was developed for this study based on a previous measure by Avci et al.⁵ and yielded a Cronbach’s Alpha of .83 which indicated internal consistency.

Perceived ease of use (PEU) and perceived usefulness (PU)

The scale used to investigate these perceptions were adapted versions developed by Lane and Coleman¹⁹ and Park, Nam and Cha²⁰. With an internal consistency of .74, the 5-item sub-scale for PEU measured perceived ease of getting skilled in using social media and finding content. The 5-item PU scale yielded an internal consistency of .85 and measured the perceived improvements in the learning efficiency of students.

Credibility evaluation

The 20-item instrument was adapted from Lumsden et al.²¹ and yielded an internal consistency of .93 for this study. The items measured how students determined the authenticity of content they find on social media.

Role of educators and demographics

In the first part of this section, 4-items asked whether students disagreed/agreed that educators should actively develop content and create groups on social media.

The second part of this asked demographic questions namely age, current year in medical school and gender. It ended with a short message of appreciation from researchers to respondents and contact information of one of the researchers.

Hypotheses were tested with a multiple linear regression as recommended by Field¹⁸ and research questions were answered with mean rankings as presented in the next chapter.

Results

Hypotheses testing

Medical students’ perceived ease of use and perceived usefulness predicts their use of social media for learning.

Scores on frequency of social media learning were inputted in a model as outcome while perceived ease of use and perceived usefulness were used as predictors.

A significant model emerged indicating support for the hypotheses, as presented below.

Table 1: Model Summary for frequency of social media learning predicted by perceived ease of use and perceived usefulness.

Model	R	R Square	Adjusted R Square	Std. Error (Estimate)
1	.70	.48	.47	.4.1

Note: Std. Error = Standard Error. This table presents a summary of the model with social media use in learning as the outcome.

The summary indicates that 48% of the variance in scores on frequency of social media learning (outcome) is accounted for by the model. For further understanding of the variance an ANOVA table (see Table 2) is presented and interpreted below.

Table 2: ANOVA table of social media learning predicted by perceived ease of use and perceived usefulness.

	Sum of Squares	df	Mean Squares	F	Sig (p)
Regression	1695.72	2	847.86	50.01	.00
Residual	1831.06	108	17.00		
Total	3526.78	110			

Note: df = degrees of freedom, F = F-Ratio, Sig (p) = Significance (p-value). The table presents analyses of variance for the prediction of social media use.

A significant F-ratio indicates that the variance accounted for by the model (see Table 1; 48%) was not due to chance but the predictors. To understand the contribution of each predictor the next table (see Table 3) presents the coefficients.

Table 3: Coefficient table of all predictors of social media learning.

Variables	B	SE	β	Sig (p)
Constant	3.27	2.77		
Perceived ease of use	1.05	.19	.53	.00
Perceived usefulness	.33	.15	.21	.03

Note: B = Unstandardized coefficient, SE = Standard Error, β = Beta, Sig (p) = Significance (p-value). The table presents coefficients for both predictors used in the multiple regression

According to the coefficients table (see Table 3), both perceived ease of use and perceived usefulness were significant predictors of social media learning.

Research questions

How do medical students evaluate the credibility of learning content on social media?

Mean scores on the credibility scale were ranked to provide insights into the methods preferred by most students, as presented in the next table.

Table 4: Ranking of scores on credibility evaluation criteria for social media learning content.

Preference	Sum	Mean	SD
Free access to information	457	4.19	.88
Depth and detail of document	419	3.84	.84
Check document domain e.g. .edu, .gov	415	3.84	1.11
Suggestions to other websites	412	3.78	.90
Date of publication	404	3.71	1.03

Note: SD = Standard deviation. This table presents a ranking of means of scores obtained credibility verification criteria of respondents.

The table above indicates support for access and depth of the document as the most highly ranked credibility criteria used by students. Domain, suggestions (references and date of publication are also highly ranked by medical students.

What role do medical students want their educators to play on social media?

The active sharing of information on social media were the most highly ranked.

Table 5: Ranking of scores on the roles expected of educators by their students.

	Sum	Mean	SD
Share content online	465	4.23	.70
Share examples of social media use in clinical practice	446	4.05	.85
Develop content on department pages or profiles	442	4.03	8.2
Develop content on personal pages	442	4.02	.77
Create study groups for students	411	3.77	1.0

Note: SD = Standard deviation. This table presents ranked scores of the role respondents expect from their educators.

The above table shows sharing of content as the most highly ranked role students want educators to play while the creation of study groups was the least preferred.

Discussion

Medical students' perceived ease of use and perceived usefulness influence their use of social media for learning

The findings support the contribution of both perceived ease of use (PEU) and perceived usefulness (PU) on the frequency of social media learning by medical students. This finding is not surprising and is an extension of assertions by Stantchev et al.¹⁴. Firstly, regarding PEU the findings mean medical students will access social media to learn if information seeking/sharing is with little effort compared to a visit to the library or an educator. This means accessing content on social media should be easier than other methods like going to the library, buying the latest version of a book or visiting an educator (Ros et al.¹⁶). Secondly, regarding PU medical students prefer learning on social media if their previous attempts led to a more effective outcome than a visit to the library or an educator. This effectiveness means the outcome of social media learning should be the same or better than traditional methods (Cheung & Vogel¹⁵). The finding supports the ease and effectiveness of social media learning as mentioned by Edmunds et al.¹⁷. The ease and effectiveness can be experienced if content credibility is comparable to book recommendations from educators or visits to educators (Avci et al.⁵), this is discussed in the next paragraph.

How do students evaluate credibility of online content?

Firstly, the findings support easy access to detailed information from known official domains (URLs) and educators as more credible than unknown sources. Secondly, there is support for the role of references to other documents with dates of publication. These documents may be preferred because their content can be verified. These findings were expected and is an extension of previous assertions by Lumsden et al.²¹. The trust in detailed, known and verifiable sources means students use these criteria to reduce the risk of learning inaccurate content, as mentioned by Broadbent and Poon¹¹. Mandalios¹² supports this by explaining that the use of these criteria and others should be trained by educators. Students understand the presence of risks in free access to learning content and they want educators to train them with skills to evaluate content. This and other expectations of students are discussed in the next paragraph.

What role do medical students want their educators to play on social media?

In line with suggestions from Hopkins et al.¹, the findings from this research proposed a more active role for educators on social media with regards to content development, guidance and experience sharing. Firstly, the students want their educators to contribute to social media learning by sharing content they find and developing content on profiles or pages of their medical school blog. Secondly, students want their educators to suggest social media sources and guide them on how to identify useful sources of information. Thirdly, the findings mean that students want educators to share more insightful clinical experience about relevant topics. These points discussed in this paragraph mean students support the active involvement of their educators on social media. This balance between the

skepticism of educators and the optimism of students is important (George & Green⁸). Educators can enable effective use of social media by integrating their traditional 'safety first' criteria with the free open access needs of the students (Brisson et al², Colin et al.¹⁰).

After the conduct of this study, researchers noticed limitation which will be stated in the next section with a suggestion to future researchers on how to improve future works.

Limitations and suggestions for future research

The limitations of this paper are with regards to the scope of data collection and the absence of hypotheses about device type of internet access. Firstly, data was collected in only one medical school which affects generalizability of findings. Future studies can collect data from more medical students and different cohorts to ensure broader generalizability. Secondly, the study focused on the frequency of social media use irrespective of the device and type of internet access. Future studies may consider this to reveal a more in-depth picture of how these affect the frequency of social media use by medical students.

Conclusion

This paper extends the assertion that frequency of social media learning by medical students is high and in need of more attention from educators. It affirms the contribution of student perceptions about ease of use and usefulness to their use of social media for learning. To make social media content more useful, medical students need to have scientific criteria for evaluation of credibility and educators need to contribute to content. As indicated by the demographics from the questionnaire presented in the methods section, the current medical students are from the millennial generation and are more likely to be active social media users. Medical schools should consider creating an online presence and encourage faculty to share their academic work and professional perspectives on topics relevant to their current and future students.

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PREDICTORS OF INTIMATE PARTNER VIOLENCE AMONG PREGNANT WOMEN- A HOSPITAL BASED STUDY IN ACCRA, GHANA

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Abstract

Introduction: Intimate partner violence in Pregnancy is a serious, preventable public health problem that affects millions of women worldwide. The term describes physical, sexual, or psychological harm by a current or former partner or spouse. It has been associated with death of both mother and baby in the severest forms of physical intimate partner violence (IPV), ante-partum hemorrhage, placenta abruption, premature birth, small for age babies, fetal injury from maternal trauma, spontaneous abortion, still births among others. There is a dearth of published studies focusing on IPV among pregnant women in Ghana.

Methods: This was an unmatched case control study, conducted among pregnant women who visited the Police Hospital for ANC from June to August 2016. We sought to determine the forms of IPV among cases, and identify the associated risk factors.

Results: All three forms of IPV were represented. There was no statistically significant difference between the means of ages of the cases and controls, age of their partners, and duration of relationship. In bivariate analysis, mothers were less likely to be victims of IPV if they had tertiary education, had salaried work or were nulliparous and also if their partners were salaried. They were more likely to be victims of IPV if they took alcohol and if their partners also took alcohol. In the multivariate analysis, however, only partner's alcohol intake was a significant predictor of IPV (AOR 2.12, p value 0.009).

Conclusions: Alcohol use by the partner could be used to screen for IPV among pregnant women in a hospital setting

Key Words: Intimate Partner Violence, Physical assault, sexual assault, verbal/emotional violence.

Introduction

Intimate partner violence (IPV) is a serious, preventable public health problem that affects millions of people worldwide. The term describes physical, sexual, or psychological harm by a current or former partner or spouse. According to Barker¹, worldwide, approximately 1.5 million women are assaulted or raped, and nearly 1,100 are killed by a current or former intimate partner yearly.

Pregnancy Intimate Partner Violence (PIPV) is compounded by the fact that two persons are involved; the pregnant woman and the unborn baby. It is associated with numerous negative consequences, including decreased infant birth weight and increased rates of prematurity². Low birth weight (LBW) and preterm births are leading causes of neonatal morbidity and mortality. Premature and low birth weight infants consume disproportionate amounts of scarce health care resources, and for those babies who survive prematurity

and low birth weight, adverse initial and long-term outcomes are common. PIPV is not routinely screened for at the out-patient's department (OPD), antenatal clinics (ANC) and other consulting rooms.

According to the 2008 Ghana Demographic and Health Survey, almost 35% of women had experienced some form of physical, sexual or emotional violence in the year preceding the survey³. This shows that there is a high level IPV in Ghana, though the survey did not question pregnant women specifically.

There are cultural beliefs in Ghana that tend to justify and therefore perpetuate IPV. The Ghana Statistical Service 2011 Multiple Indicator Cluster Survey (MICS), which was a nationally representative household sample, indicated that 23% of women believe that a husband is justified in beating his wife or partner in various circumstances. As a result, many women who are subject to domestic violence are unwilling to report the crime or access support services and suffer in silence with grave consequences³.

In Ghana, efforts to reduce adverse maternal outcomes of pregnancy among other things has focused on the "three delays model". These are delays in realizing that there is a problem with the pregnancy often at home leading to delay in seeking care, delays in transportation to the health facilities or delay in reaching care in time, and delays in the health facilities itself

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leading to delay in receiving adequate treatment⁴. Somehow, the effect of PIPV in adverse outcomes of pregnancies are not given the due attention.

The long-term sequelae of extremely premature and low birth weight (LBW) infants has been well documented. Such children commonly have cognitive deficits, motor function delays including cerebral palsy, academic difficulties, language delays, and significantly increased rates of attention problems, behavioural difficulties, and psychological problems^{5,6,7}. Physical abuse involving abdominal trauma can lead to premature labour, rupture of membranes, placental abruption, and ruptured uterus, all of which lead to preterm birth or even fetal demise^{8,9,10,11}. In Ghana, more attention is given to diabetes and eclampsia as well as preeclampsia for which pregnant women are routinely screened. There is no systematic screening of PIPV though there is enough evidence that PIPV affects delivery outcomes. In Ghana, there is not much publication associating adverse pregnancy outcomes with pregnancy intimate partner violence.

In the light of the above mentioned, it is necessary that a study be conducted to determine the various forms of PIPV and the possible risk factors. A tool for screening if simple enough could be used to select pregnant women more at risk of PIPV for focused attention and early referral for the required professional help. Also, a study of risk factors could be used to develop policies for prevention of PIPV, advocacy programmes for PIPV in general and lead to effective referrals and interventions.

Hypothesis

1. Pregnant women whose partners take alcohol are two times more likely to be victims of PIPV
2. Pregnant women of low educational status (less than high school) are two times more likely to be victims of PIPV
3. Pregnant women who **witnessed/experienced** physical violence in childhood are two times more likely to be victims of PIPV
4. Adolescent pregnant women (10 to 19 years) are two times more likely to be victims of PIPV

Objectives

- To determine the forms of PIPV that are present among identified cases at the Police Hospital
- To assess risk factors of PIPV among ANC attendees at the Police Hospital

Materials and Methods

Study site

This study was conducted at the Police Hospital, located in the La Dadekotopon Metropolitan Area. Currently over 80% of attendances at the OPD are civilians.

Study design

This was an unmatched case-control study

Study population

The study population was all pregnant women that attended ANC at the Police Hospital from July to September, 2016.

Case definition

A case was an attendant at the ANC that had experienced any of the three forms of PIPV in the current pregnancy and was willing to take part in the study.

Control definition

A control was an ANC attendant that had not experienced PIPV in the current or index pregnancy and was willing to take part in the study.

Inclusion criteria

Included in the study were ANC attendees, that did not have co-morbidities like severe hypertension, severe anaemia, poorly controlled diabetes and antepartum haemorrhage and consented to taking part in the study.

Sample size calculation

Stat Calc from Epi Info version 7 was used for the sample size calculation for an un-matched case-control study. With a two-sided confidence level of 95% and Power at 80%, the ratio of controls was set at 1:1. With the odds ratio set at 2. The percentage of controls exposed to low level of education (below high school level) was set at 26.1%¹². We arrived at a sample size of 302. One hundred and fifty-one being cases, and the same number as controls.

Selection of cases and controls

Cases and controls were consecutively selected. For each case, there was one control. Following the selection of a case, the following consecutive control was also selected. This procedure was followed until the sample size was achieved. From the start of the study, every woman that presented at the ANC was enrolled. If she declined to take part in the study, the next available woman was selected.

This procedure was followed till the required number of respondents was reached for both the cases and controls. One hundred and fifty-three women for each group. In the Police Hospital focused antenatal care is provided in cubicles. From the start of the study, all attendees were informed of the ongoing study. This information was repeated when they got into the cubicles to be seen. A selected case or control was ushered into another room where privacy was ensured. A research assistant explained the essence of the research again, and a consent form was administered.

After this, the structured questionnaire was administered. The hospital's clinical psychologist was on standby throughout the period of the study in his office which was four doors away from the designated research room. There was no need to refer any pregnant woman to him during the period of data collection.

Data capture

Data were captured with a structured questionnaire. The outcome variable was PIPV in any of the three forms. The independent variables at the partner and woman levels examined were the following; Age in completed years, religion, highest level of education **attained**, marital status, highest level of education attained, experience of violence in childhood, profession, **alcohol consumption by pregnant woman as well as the partner**, psychological, physical, sexual assault.

Training of research assistants

Four research assistants who were involved with data collection were trained for one day, to make sure of standardization of information.

Pre-testing of data capture tools

The structured questionnaires were pre-tested **among pregnant women** at the Tesano Depot Police Clinic. This health facility was not part of the study. Necessary re-structuring and re-organisation of the data collection tools was done before the actual collection of data begun.

Data Analysis

Data captured from the structured questionnaires were entered into Microsoft Excel spreadsheet. It was then exported into Epi info version 7 and SPSS version 21 for analysis. Univariate analysis was done by running frequencies, percentages, and means. Bivariate analysis was performed with the use of odds ratios. Multivariate analysis involving the use of binary logistic regression was done to show the relationship between binary dependent and independent variables. P -value < 0.05 with 95 % confidence interval (CI) for OR (odds ratio) was used in judging the significance of the associations. Results were presented in text, tables and charts.

Quality assurance

Data were checked for completeness and internal inconsistencies. Double entry programmes were used to reduce possible data entry errors.

Ethical and legal considerations

Ethical clearance was sought from the ethical committee of the Ghana Health Service. Approval for the study was also sought from the management of the Police Hospital. Consent was sought from the participants of the study, before the questionnaires were administered in the language that the client was comfortable with. Privacy and confidentiality were assured throughout the study period. Since the study involved the recall of unpleasant events, a clinical psychologist was on standby throughout the study period to help respondents when necessary.

Results

Age of cases and controls

The age distribution among cases and controls are depicted in table 1.

Most of the cases and controls were in the 25 to 29 and 30 to 34 age groups as depicted in Figure 1.

Marital status and religious affiliation of cases and controls

Most of the cases as well as the controls were married and living together with their spouses. Seventy-one percent of the controls and **sixty-five percent** of the cases were married. Among cases 34.6% were not married whilst this was 28.9% among controls. Most of the respondents (cases and controls combined) were Christians 266(87.2%). Muslims were 30 (9.8%) with 4(1.3%) being adherents of African Traditional Religion. Five of them (1.6%) had no religious affiliation.

Occupation of cases and controls

Most of the cases were traders 50(32.7%) followed by skilled artisans 47(30.7%), those without any occupation 13(8.5%) and unskilled labourers 4(2.6%). Among the controls however, majority were salaried workers 60(39.2%), followed by skilled artisans 41(26.8%), traders 36(23.5%), no occupation 11(7.2%) and unskilled labourers 4(2.6%)

Alcohol consumption among cases and controls

Among the cases, 23(15.2%) took alcohol as against 13(8.6%) of the controls. Majority of both cases and controls were not taking alcohol.

Witness of assault in childhood among cases and controls

All cases **153 (100%)** had witnessed assault in childhood as against **153 (98.70%)** of controls.

Table 1. Mean, median and mode of the ages of the cases and controls

	Observations	Total of their ages	Mean	Variation	Std. Dev	Min Value	Median	Max Value	Mode
Case	153	4654	30.41	26.69	5.16	17.00	30.00	44.00	28.00
Control	153	4546	29.71	20.86	4.56	21.00	30.00	41.00	30.00
Total	306	9200	30.06	23.82	4.88	17.00	30.00	44.00	44.00

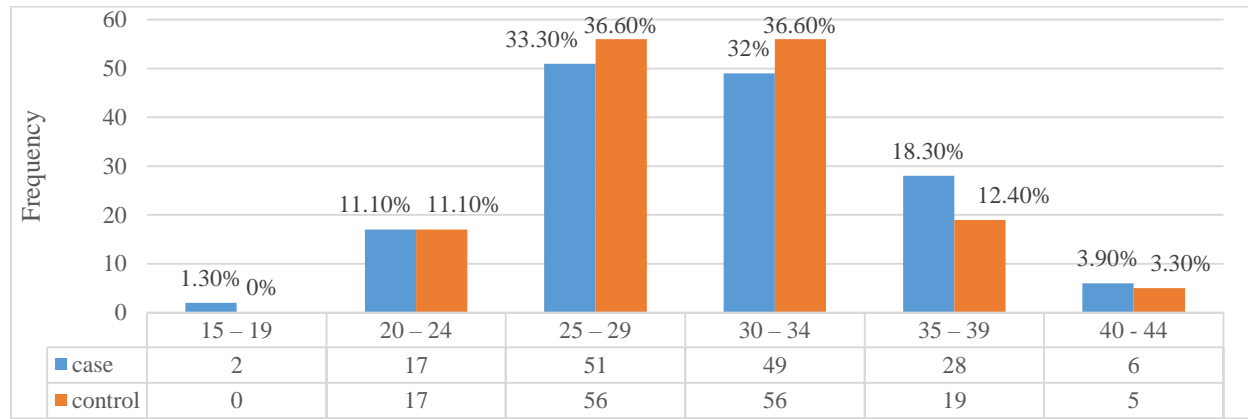


Fig 1. Distribution of cases and controls by age groups.

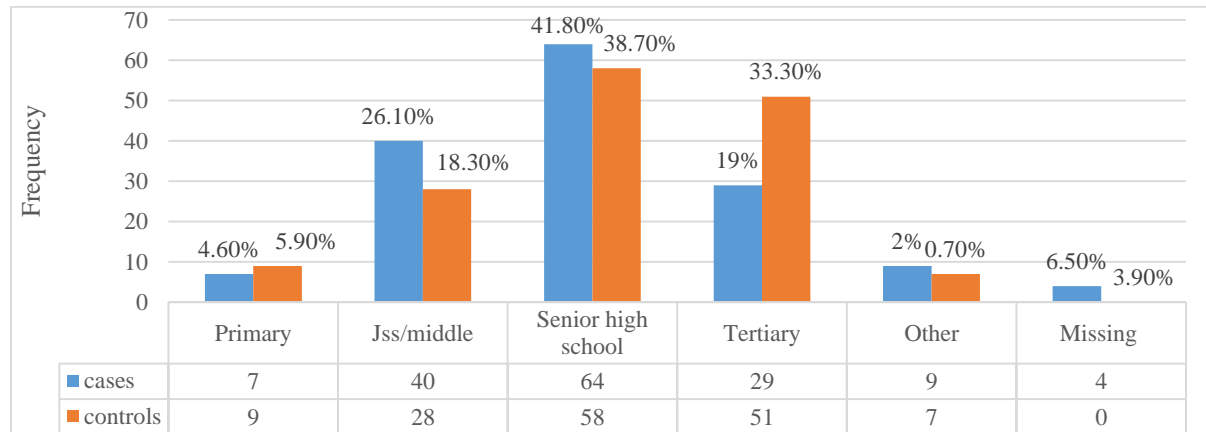


Fig 2. Distribution of cases and controls by educational status

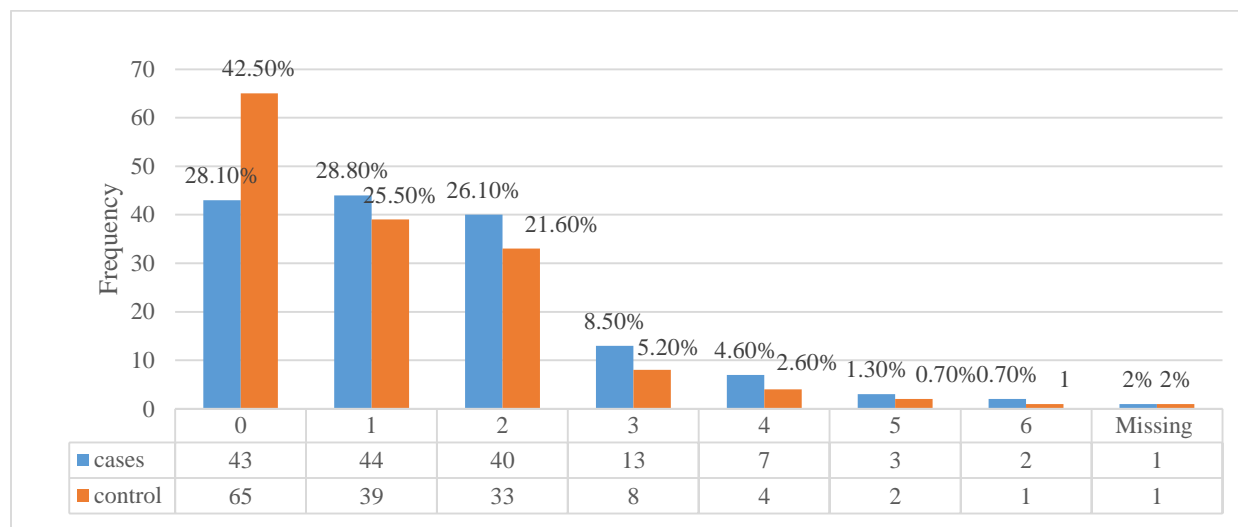


Fig. 3 Distribution of cases and controls by parity

Educational status of cases and controls

As depicted in figure 2, most of the cases 64(41.8%) and controls 58(38.7%) had secondary level education. More of the controls 51(33.3%) as compared to the cases 29(19%) had tertiary level education.

Parity of cases and controls

Most of the cases 44(28.8%) were primips whilst most of the controls 65(42.5%) were nullips. The maximum number of children for both cases and controls were six. This is depicted in Fig. 3.

Types of PIPV among cases

Among the cases, all three forms of IPV were represented. Sixty (39.2%) of the cases had been physically assaulted by their partners.

Forty-one (26.8% n=153) of the cases had been forced to have sex against their will by their partners. Almost all the cases were emotionally assaulted. Of the 153 cases, 136 (88.9%) had been insulted by their partners. Also, 13 (8.5%) were afraid of their partners.

Table 2 Analysis of **discrete** variables of cases, controls and their partners

Parameter	Case (N = 153)	Control (N = 153)	T test	95% CI of Mean Diff.	p-value
Age of women (yrs)	30.42 ± 5.12	29.71 ± 4.57	1.2661	-0.39 – 1.80	0.206
Age of partners (yrs)	35.92 ± 6.51	34.94 ± 5.67	1.4560	- 0.39 – 2.35	0.161
Duration of marriage (yrs)	5.40 ± 4.52	4.55 ± 3.99	1.7845	- 0.11 - 1.81	0.082
Parity	1.38 ± 1.57	1.00 ± 1.22	2.7875	- 0.11 - 0.65	0.006*

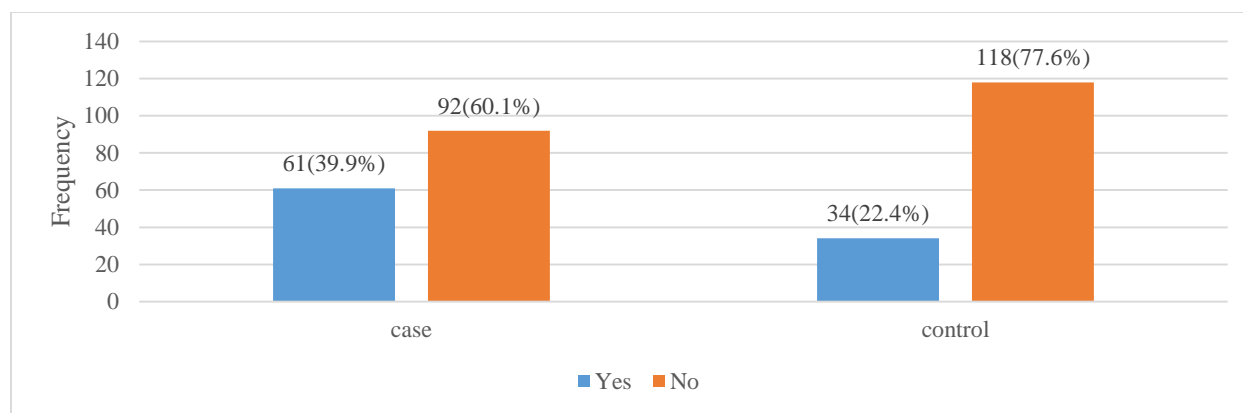


Fig. 4 Distribution of alcohol use among partners

Analysis of discrete variables

As depicted in Table 2, there was no statistically significant difference between the means of ages of the cases and controls, age of their partners, and duration of relationship. However, there was a statistically significant difference p=0.006) between the means of the number of children among the cases and controls.

Alcohol consumption among partners

From figure 4, in both the partners of cases and controls, fewer took alcohol. However, the number that took alcohol among the partners of the cases were more than the partners of controls. 61(39.9%) against 34(22.4%).

Partner’s occupation

Most of the partners of the cases and control were salaried workers. However more of the partners of controls were salaried workers 106(69.3%) as compared

to the partners of the cases 78(51%). One (1) each of the partners of cases and controls did not have any occupation.

Partner’s education

As shown in Fig. 5, all the partners of the cases and controls had some form of education. More of the partners of controls had tertiary education. This was 54(36.5%) for partners of cases and 67(44.7%) for partners of controls. Twenty-five percent of partners of cases had secondary education as against 16% of partners of controls.

Association of social characteristics of cases and controls with PIPV

Risk factors of PIPV are depicted in table 3. Women who had less than twelve years of education were 1.5 times more likely to experience PIPV than those who had twelve years or more of education

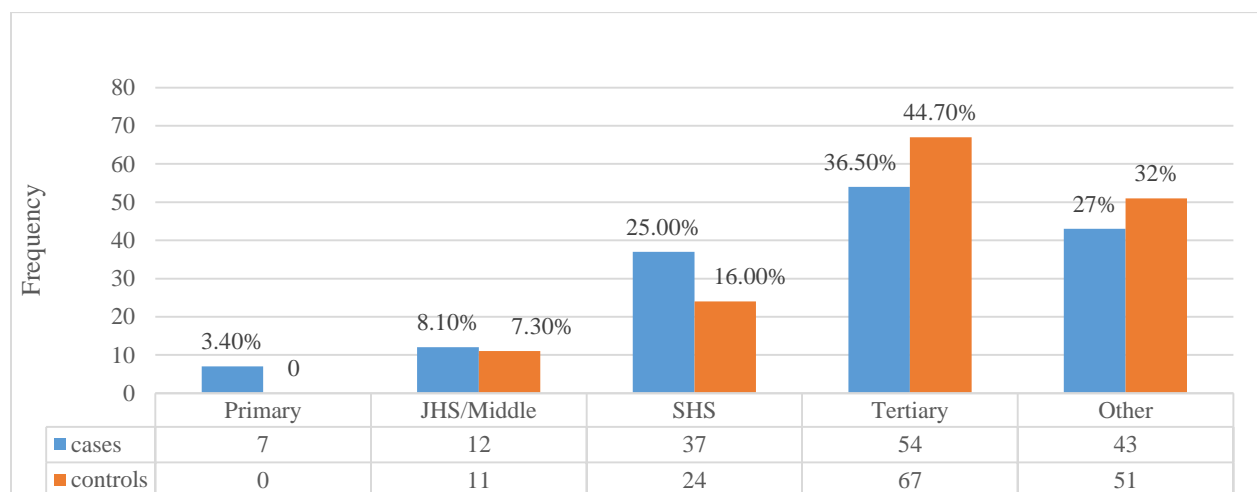


Fig. 5. Educational level of Partners

Table 3. Association of social characteristics of cases and controls with PIPV Risk factors of PIPV

VARIABLE	CASE N (%)	CONT N (%)	CRUDE OR	95% CI	P VALUE
Mothers with <12years of school	43 (33%)	36 (25%)	1.5	0.9038--2.5212	0.0587
More than 12 years	96 (67%)	111(75%)			
Mothers with tertiary education	29(20.28)	51 (34.69)	0.4788	0.2817--0.8140	0.0031*
Mothers without tertiary education	114(79.72)	96(65.32)			
Single mothers	53(34.64)	44 (28.95)	1.3009	0.8022 --2.1098	0.1446
Married mothers	100(65.36)	108(71.05)			
Salaried mother	38(24.84)	60(39.22)	0.5133	0.3139 - -0.8358	0.0036*
Non-salaried mother	115(75.16)	93(60.78)			
Nulliparity mothers	43(28.10)	65(42.48)	0.5292	0.3286--0.8523	0.0044*
Non Nulliparity mothers	110(71.90)	88(57.52)			
Mothers 19yrs or less	0	0	-	-	-
Mothers >19 years	153(100)	153(100)			
Mother witness of beating in childhood	153(0)	148(97.37)	-	-	-
Not witnessing	0(0)	4(2.63)			
Mother beaten in childhood	153(100)	151(98.69)	-	-	-
Not beaten	0(0)	2(1.31)			
Mother's taking alcohol	23(15.23)	13(8.55)	1.9213	1.3401---3.9520	0.0379*
Not taking alcohol	128(84.77)	139(91.45)			
Salaried Partner	78(50.98)	106(69.28)	0.4611	0.2890--0.7359	0.00056*
Non-salaried partner	75(49.02)	47(30.72)			
Partners drinking alcohol	61(39.87)	34(22.37)	2.3012	1.3953---3.7950	0.0005*
Not drinking alcohol	92(60.13)	118(77.63)			
Tertiary education of partner	40(27.03)	48(32.00)	0.7870	0.4777---0.4761	0.1753
Partner without tertiary	108(72.97)	102(68.00)			

This finding was however not statistically significant (OR 1.5, CI 0.9038 - 2.5212, P value >0.05). Tertiary education of women was found to be protective. Women who had tertiary education were 48% less likely to be a victim of PIPV as compared to their counterparts without tertiary education. This finding was statistically significant. (OR 0.48, CI 0.2817 - 0.8140, P value <0.05). Single mothers were 1.3 times more likely to be victims of PIPV as compared to married mothers. This finding was however not statistically significant (OR 1.3, CI 0.8022 -- 2.1098, p value >0.05). Salaried mothers were 51% less likely to be victims of PIPV as compared to their non-salaried counterparts. This finding was statistically significant (OR 0.51, CI 0.3139 - 0.8358, p value <0.05). Pregnant women who had never given birth (primips) were 53% less likely to experience PIPV as compared to those who had previous births. This was statistically significant (OR 0.53, CI 0.3286 - 0.8523, p value <0.05). Effect of adolescence on being a victim of PIPV could not be assessed because of small numbers. The same was found for mothers who either experienced or witnessed physical assault in childhood. Mothers who took alcohol were 1.9 times more likely to be victims of PIPV as compared to those who did not take alcohol. This finding was statistically significant (OR 1.9, CI 1.3401 -3.9520, p value <0.05).

Women who had salaried partners were 46% less likely to be victims of PIPV as compared to those whose partners were not salaried workers. This was statistically significant (OR 0.2890 -0.7359, p value <0.05). Women whose partners took alcohol were 2.6 times more likely to be a victim of PIPV. This was statistically significant (OR 2.3, 1.3953 - 3.7950, p value <0.05). Women whose partners had tertiary education were 78% less likely to be victims of PIPV. This finding was however not statistically significant (OR 0.78, 0.4777 - 0.4761, p value > 0.05).

Binary Logistic Regression

Results of Binary logistic regression are shown in table 4. Binary logistic regression was employed in order to examine the extent to which the independent variables were associated with the dependent variable (PIPV). The output below shows the odds ratio and standard error for all the independent variables for which the bivariate analysis showed significance. Controlling for all other variables in the model, only one variable was a significant predictor of PIPV. After adjustment of the odds ratios, only partner’s alcohol consumption was significant. AOR 2.12, p value <0.05.

Table 4. Table of Binary Logistic Regression of significant variables.

Variable	B	S.E.	Wald	OR	P value
Mothers with tertiary education	-.280	.330	.717	.756	.397
Salaried mothers	-.402	.314	1.631	.669	.202
Nulliparity	-.561	.411	1.863	.571	.172
Salaried partner	-.513	.270	3.611	.599	.057
Partner drinking alcohol	.753	.286	6.908	2.123	.009*
Mother drinking alcohol	.137	.413	.111	1.147	.739
Parity	.011	.183	.003	1.011	.954
Constant	1.274	1.184	1.158	3.574	.282

Discussion

Pregnancy intimate partner violence is a serious public health issue that could end with dire consequences for both mother and baby. A lot of studies have been done outside of Ghana concerning this matter. However, in Ghana most of the studies do not refer to pregnant women specifically, though there are studies on domestic violence as well as partner violence. Majority of these studies focused on the community with the 2008 GDHS as the main source document. This is the first time that a study focused on factors influencing the occurrence of PIPV has been done in a Hospital setting to the best of my knowledge.

In this study, women who had less than twelve years of education were 1.5 times more likely to experience

PIPV than those who had twelve years or more of education. This finding was however not statistically significant (OR 1.5, CI 0.9038-- 2.5212, P value >0.05). Women with less than 12 years of education are likely not to have completed Senior High School and may not be earning enough money and thus may not contribute financially to the upkeep of the home. Their increased reliance on their partners for their needs may lead to PIPV. Saltzman et al.,¹³ also reported an increase in physical violence in pregnant women who had less than 12 years of education. It is noteworthy however, that their study was a population based one which involved 16 states in USA whilst this study measured all forms of violence and not physical violence in isolation. Again,

this study was a hospital based one and not population based.

In keeping with previous findings, tertiary education of women was found to be protective against PIPV in this study. Women who had tertiary education were 48% less likely to be a victim of PIPV as compared to their counterparts without tertiary education. This finding was statistically significant. (OR 0.48, CI 0.2817-- 0.8140, P value <0.05). Women that are highly educated are prized by their partners because they would probably be bringing in income and help in the running of the home or be contributing to the economic welfare of the home. Our finding is less than that found in a study involving postgraduate female students in Ibadan¹⁴ where postgraduate students were 64% less likely (95% CI 0.46-0.87) to suffer partner violence. That study was not done in pregnant women, and was a cross sectional study. However, the risk factors for IPV are mostly similar to that of PIPV.

In this study, single mothers were 1.3 times more likely to be victims of PIPV as compared to married mothers. This finding was however not statistically significant (OR 1.3, CI 0.2817-- 1.8140, p value >0.05). The value placed on single women by their sexual partners is usually less than that placed on married women. In Ghana bride price is usually paid to the woman's family to seal the marriage union. In such cases, it is said that the family of the woman will have a lot of questions to ask the husband if something untoward happens to their daughter. Because of this, if there is no bride price paid for a woman before she gets pregnant, then the society looks down on such a woman and the partner does not place a high value of the woman hence maltreatment. Studies done elsewhere by Saltzman et al¹³ showed a far bigger risk of four-fold increase in PIPV risk as compared to married women. Whilst the present study was hospital based, that was a population based study involving 16 states in the United States, that focused on physical violence alone during pregnancy. There is however a different finding by Tanimu et al¹⁵ in Kano Nigeria. They found that being married ($X^2 = 24.72$, p value = 0.00) increased the likelihood of IPV. His study though hospital based was a cross-sectional one, and they interviewed women aged 15 to 49 who had ever been in an intimate relationship but was not pregnant. Also, socio cultural differences between the two countries could account for their different finding.

Salaried mothers were 51% less likely to be victims of PIPV as compared to their non-salaried counterparts. This finding was statistically significant (OR 0.51, CI 0.3139 - 0.8358, p value <0.05). Women who had salaried partners were 46% less likely to be victims of PIPV as compared to those whose partners were not salaried workers. This was statistically significant (OR 0.2890--0.7359, p value <0.05). It appears in our study that salaried work on the part of partner and pregnant women were both protective against the occurrence of PIPV. Socio-economic status has been shown to be

protective against partner violence. This may be because partners might be receiving salaries at the end of each month and this could alleviate the economic hardship in the home. Salaried couples may also be educated and this could also play a part in this finding. Studies that are population based, in Chile, Egypt, India and the Philippines¹⁶ demonstrated that socioeconomic indicators were the most commonly and universally predictive factors of PIPV.

Pregnant women who had never previously given birth (nullips) were 53% less likely to experience PIPV as compared to those who had previous births (OR 0.53, CI 0.3286--0.8523, p value <0.05). Though this finding was not statistically significant, it indicates that women could be less prone to being victims of PIPV when they are carrying their first pregnancy. In Iran¹⁷, Farrokh-Eslamlou et al found that PIPV was significantly associated with a gravidity of two. Makayoto et al¹⁸, reported that women who experienced PIPV were more likely to be multiparous (OR 1.94, 95% CI=1.01-3.32). The differences could be due to the fact that the study designs were different and the parity variables were stated differently.

Effect of adolescence on being a victim of PIPV could not be assessed because of small numbers. This could be because of the fact that this study was based in the Police Hospital in Accra. The insufficient numbers could be that they were reluctant to attend ANC at the hospital because of perceived fear of arrest or harassment. The other reason could be the location of the hospital in a very urban setting, where such incidences might be rarer than in the rural areas. Because of education, most girls in the urban centers will be in school at that age, received education about contraceptive use and might not get pregnant though they may be engaging in sexual activities. Furthermore, the shame of dropping out of school might deter some of the adolescents from engaging in sex entirely. In a National survey in the United States¹³, there was almost a double risk of PIPV for women under 20 years of age. That was a national survey so the possibility of getting sufficient numbers of adolescent mothers was higher. The social and cultural dynamics are quite different for the two countries.

The same was found for mothers who either experienced or witnessed physical assault in childhood. The effect of experiencing or witnessing violence as a child could not be assessed as a factor of PIPV because almost all the respondents had experienced same in childhood. In Ghana in almost all cultures, child beating is a normal occurrence as well as witnessing it since its quite common. This is in stark contrast with what pertains elsewhere, such as Kenya, where in a cross sectional study of 300 pregnant women, those who experienced PIPV were more likely to have witnessed maternal abuse in childhood (aOR 2.27, 95% CI 1.05-4.89)¹⁸.

In this study, mothers whose partners had tertiary education were 78% less likely to be victims of PIPV.

This finding was however not statistically significant (OR 0.78, CI 0.4777--0.4761, p value > 0.05). Makayoto et al¹⁸, reported an adjusted OR of 0.37, (95% CI =0.16-0.83). Their study, though hospital based, was cross sectional. It is believed that though cultural influences are present, high level of educational achievement inhibits men from perpetrating PIPV. Our finding is in consonance with that reported by Owusu Adjah et al.,¹⁹ using the 2008 GDHS, women whose husbands had higher than secondary education were 48% less likely to experience domestic violence. They used a nationally representative sample that was mainly community based. Also, they researched domestic violence and not PIPV specifically.

Mothers who took alcohol were 1.9 times more likely to be victims of PIPV as compared to those who did not take alcohol. This finding was statistically significant (OR 1.9, CI 0.9340--3.9520, p value <0.05). Alcohol could inhibit as well cause a derangement in thought of the women. They may be more violent when drunk as opposed to when sober. This increase in likelihood of being a victim of IPV when a woman takes alcohol was also demonstrated in a cross sectional study of post graduate female students in Ibadan, Nigeria¹⁴ where students who drank alcohol were more likely to suffer IPV (OR 2.40, 95% CI 1.82-3.06). It is understood that post graduate female students might drink more alcohol than pregnant women and this could explain the differences in the Odds ratios. Also, the study design as well as possible socio-cultural differences between Ghana and Nigeria could explain the difference.

Women whose partners took alcohol were 2.6 times more likely to be a victim of PIPV. This was statistically significant (OR 2.3, 1.3953--3.7950, p value <0.05). In logistic regression, this was the only significant predictor of PIPV. This finding is in agreement with several studies irrespective of the study design. In a cross sectional hospital based study among women who had ever been in an intimate relationship in Kano by Tanimu et al.,¹⁵ alcohol consumption by partner was found to increase the likelihood of IPV (OR 2.3, 95% CI 1.151-3.230 p value = 0.00). In another study in Kenya¹⁸ among 300 randomly selected pregnant women, having a partner who drank alcohol increased the likelihood of PIPV (aOR 2.32, 95% CI =0.16 – 0.83). Alcohol is widely considered to be a key proximal predictor of IPV because of the hypothesized dis-inhibitory effect on aggression²⁰.

Conclusion and Recommendations

In the case control arm of this study, all the forms of PIPV were identified among the cases. In bivariate analysis, women who were less likely to be victims of PIPV had tertiary level education, were salaried, nulliparous and had partners who were also salaried. Women who took alcohol and those whose partners took alcohol were more likely to be victims of PIPV. However, in the logistic regression analysis, only

partner's alcohol intake was a significant predictor of PIPV. This study therefore confirmed only one of the four hypotheses that pregnant women whose husbands took alcohol were twice more likely to be victims of PIPV.

Pregnancy intimate partner violence is a complex issue in Ghana. From this study, it has emerged that more research needs to be done to identify more characteristics of pregnant women that make them prone to it. This study has contributed towards this goal.

Recommendations

We recommend the following;

TO THE OBSTETRICS AND GYNAECOLOGY DEPARTMENT, POLICE HOSPITAL

1. Antenatal attendees must be encouraged to disclose PIPV through health talks.
2. Partner's alcohol use could be used to screen for PIPV.
3. Partners of pregnant women must be educated on the consequences of taking alcohol on the mother and baby.

TO THE GHANA HEALTH SERVICE

1. They **could** commission a multi-center nationwide study to determine the prevalence of PIPV among pregnant women in Ghana. This study could also attempt to identify the effects of PIPV on mother and baby in Ghana.
2. The GHS **could** train nurses on various aspects of PIPV and their role in its identification and prevention.
3. Information about PIPV **could be** put on the ANC card.
4. The service **could** enact a policy of including fathers in educational sessions for pregnant women, stating the role of alcohol consumption in PIPV.

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PSYCHIATRISTS' DISCLOSURE OF THE SIDE EFFECTS OF MEDICATIONS TO PATIENTS WITH SCHIZOPHRENIA IN A MAJOR HOSPITAL IN NIGERIA

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Abstract

Background: Crucial factors to consider in the management of psychotic disorders are the side effects of medications administered in these conditions. They commonly occur with all known classes of antipsychotics used in the treatment of schizophrenia, and this influences adherence.

Objectives: This study determines the extent to which doctors disclose the potential side effects of antipsychotics to patients and its association with drug adherence behavior.

Method: Adult patients with schizophrenia who were receiving medications at a psychiatric facility were sampled over a 2-year period. Consenting patients who met the inclusion criteria completed a questionnaire requesting information on the knowledge about side effects of their medications, sources of this knowledge and the side effects they were experiencing while using these pills. They also responded to the Medication

Adherence Rating Scale-10. The data generated was analyzed by means of frequencies, means and Chi square test.

Results: 175 respondents were interviewed. Their mean age was 36.01+/-9.71 years, with a male preponderance. 96% of the respondents were not informed about the likely side effects of their drugs before commencing treatment. No statistically significant relationship between having knowledge about side effects and drug adherence $p=0.137$. All the patients were on conventional antipsychotics with some actively experiencing side effects, most of which were fatigue and somnolence.

Conclusion: The non-disclosure of information about side effects of medications to patients were enormous. There is a need for psychiatrists to give facts and details about treatment to their patients to enhance standard of care

Key Words: Psychiatrist Information, Side effects, Antipsychotics Schizophrenia

Introduction

Side effects of medications is arguably the most crucial factor often considered prior to antipsychotic prescription. They are often intolerable, profound, disabling and constitute a part of the disease burden^{1,2}. Side effects influences, and are more predictive of quality of life in schizophrenia than clinical and psychosocial variables³. It is a significant contributor to poor adherence of medication in schizophrenia^{4,5,6}. Non adherence to medications potentially has grave consequences on patients and their families, resulting in relapse, rehospitalisation, longer time to remission, higher cost of treatment/loss of income, reduced quality of life and attempted suicide^{7,8}.

Providing information to patients about the potential side effects of antipsychotics is an essential part of management aimed at encouraging favourable patient attitude to treatment and drug adherence.

Patients complain about insufficient information about the expected effects of prescribed medications and how it adversely impacts their willingness to use the drugs⁹. Some studies on the need for educating patients with schizophrenia about the side effects of medications reported a potential advantage of such education to relapse prevention from medication discontinuation^{10,11,12}. There is an indication of a positive impact of this knowledge of medication to adherence¹³.

It is a part of good medical and ethical practice behaviour for health care professionals to give this information. For instance, under the heading for consent guidance of the General Medical Council, this element has been captured: "...You must tell patients if an investigation or treatment might result in a serious adverse outcome even if the likelihood is very small. You should also tell patients about less serious side effects or complications if they occur frequently, and explain what the patient should do if they experience any of them¹⁴."

Studies have explored the extent to which doctors give information to their patients about side effects of medications in countries where practice regulations clearly stipulate such information-sharing^{14,15}. However, there is relative dearth of information on patients' perspective of how much information they have

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Conflict of Interest: None Declared

received from their doctors. This study therefore aims to determine the awareness and knowledge of side effects of medications in schizophrenia patients. It investigates whether information have been given by doctors and its relationship to drug adherence in a setting where regulations do not clearly stipulate the giving of such information.

Materials and methods

The study was carried out at the psychiatric outpatient clinic of a public federal teaching hospital. It is a major tertiary health facility located in North-West Nigeria. The psychiatry department provides mental health services to patients of the hospital, those referred from other peripheral hospitals, neighbouring cities and other parts of the country. The out-patient clinic has subspecialty units run by psychiatrists and psychiatry-trainees. However, psychotropic medications are first prescribed by a consultant psychiatrist. After this, trainees may write drug- refill prescriptions for stable patients under the guidance of their supervising consultants.

It was a study of adult patients (18 years and above) with schizophrenia attending the outpatient clinic. An average of six patients were randomly selected per week over a 2-year period from May 2014 to April 2016. There were two clinic days per week, run by 21 doctors who had different and changing schedule of clinic activities. Therefore, on each clinic day, the first three eligible patients to consult the first three doctors to arrive at the clinic were selected. At the next clinic day, this process was reversed to include the last 3 consultations. To prevent repetition of data collection, case notes were assigned unique number identifiers to distinguish those who had been interviewed previously. There was a 2-months industrial strike action which interrupted data collection for that period.

Those selected had been diagnosed by a consultant psychiatrist using the International Classification of Disease (ICD-10) criteria before the preceding 12 months, had been receiving antipsychotics for at least 1 year prior to the interview and were regular attendees at the clinic. Patients who were clinically unstable and had marked cognitive dysfunction were excluded from participation.

The instruments used includes:

1. A form which extracted socio-demographic information related to some key variables of the participants such as age, sex and religion.
2. A questionnaire regarding the knowledge patients have and the information they have received on the side effects of medications such as: "are you aware of any side effects of the drugs you are taking?" "Were you warned about side effects by your doctor when you first started to use the drugs?" ...etc.
3. The Medication Adherence Rating Scale (MARS). The Medication Adherence Rating Scale (MARS) is a ten-item self-report measure of medication adherence in psychosis. It was developed based on the Drug Attitude

Inventory (DAI) and Medication Adherence Questionnaire (MAQ). It is designed and validated for patients with schizophrenia¹⁶. The MARS assesses both beliefs and barriers to medication adherence¹⁷, at the implementation and discontinuation stage of the medication talking. The MARS is scored from 0-10, in increasing order of adherence. Each question gets 1 mark. Reverse scoring was made on Questions 7 & 8. A total score of 6 and above was taken as "good adherence" while a score of 5 and below indicated "poor adherence."

The instruments were translated to Hausa language using back-translation method. The interview was also conducted in Hausa language by doctors who were proficient in the language, as this was the predominant language understood by majority of our study population.

The Health Research Ethics Committee of the Ahmadu Bello University Teaching hospital approved the study protocol. In addition, informed consent was obtained from each eligible participant, after explaining the purpose of the study, reassuring them of confidentiality and that there was not going to be any consequence for non-participation.

Eligible patients were identified on each clinic day after retrieval of their clinical records, and prior to seeing their doctors. On each clinic visits, the first three eligible patients to be seen by the first three doctors to arrive the clinic were selected. At the next clinic, the last 3 patients to consult the last three eligible doctors to arrive the hospital were selected. This procedure was maintained until one hundred and seventy-five patients were interviewed. Data collection was interrupted for about 2 months as a result of industrial strike action at the hospital which grounded all clinical activities. The data obtained was entered and analysed by means of descriptive statistics using the Statistical Package for Social Sciences for windows (SPSS) version 20 (SPSS Inc. Chicago).

Results

The age of the respondents ranged from 18 to 60 years, with a mean of 36.01+/-9.71 years. There were 100 males and 75 females. 81% of them were Moslems while 19% were Christians. Their average years of education was 8.81, SD 5.70. The age of the respondents was split into a dichotomous variable of 40 years and below and the above 40s. There was no statistically significant relationship between the age and sex groupings and adherence. However, this association was found between religion and adherence [table 1].

"Knowledge of side effects" stands for the information patients had on this subject at the time of interview, and the means through which they knew is the "Source of knowledge of side effects." "Doctors prior information about side effects" represents the initial status of information provided by the physician who first prescribed the medications

Table 1. Relationship between bio-demographic variables and medication adherence

	Poor adherence	Good adherence	Statistics
Age			P=0.834
< 40years	43	85	
>40 years	15	32	
Sex			P=0.963
Male	25	50	
Female	33	67	
Religion			P=0.004
Christianity	18	15	
Islam	40	102	

57.7% of the respondents had no knowledge about the side effects of antipsychotics medications up to the time of the interview. Among those who knew about side effects, a slight majority (54.1%) reportedly became aware by personally experiencing these side effects. Only 4% received prior warning from the first prescriber about potential side effects at the point of commencing antipsychotic therapy [table 2].

Table 2. The distribution of knowledge about side effects of the respondents

	Frequency	Percentage
Knowledge of side effects		
Had knowledge	74	42.3
Had no knowledge	101	57.7
Source of knowledge of side effects		
Doctor told me	32	43.2
It happened to me	40	54.1
Other sources	2	2.7
Doctor's prior information about side effects		
Given	7	4
Not Given	168	96

On the MARS, 115 (65.7%) respondents had good adherence. Of these, 44 patients had knowledge about side effects while 71 had none up to the time of interview. There was no statistically significant relationship between having knowledge about side effects and drug adherence $p=0.137$.

The use of antipsychotics in the respondents ranged from 1 to 30 years, with a mean duration of 7.65 ± 6.05 years. The respondents were largely prescribed the conventional antipsychotics. 100 respondents were receiving haloperidol, which was the most prescribed drug, 53 of them were placed on chlorpromazine and 33 were on trifluoperazine. The most commonly reported side effect of these medications was fatigue [figure 1].

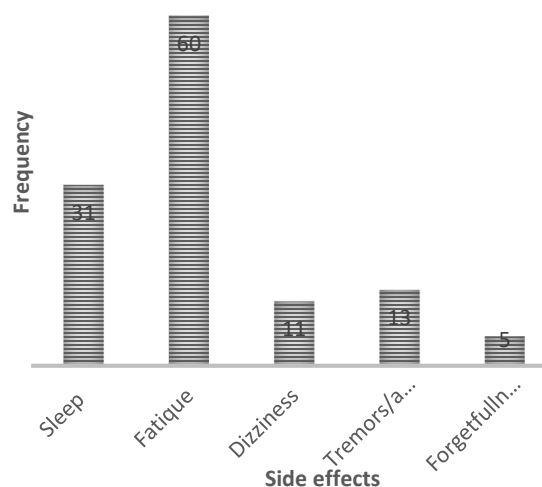


Fig 1.

Discussion

This study was carried out among patients with schizophrenia who were visiting the psychiatry out-patient clinic of a tertiary hospital. Most of the patients attending this clinic were found to be young and in their third and fourth decades of life. A study conducted earlier among same patient population found 67% of the respondents below 40 years of age.¹⁸ Similar findings have also been reported in central India and China.^{19,20} However, another cross-sectional survey among schizophrenia out-patients in a hospital in Nigeria documented that 40% of their respondents were in that age category.²¹ This variation could be partly accounted for by methodological differences, as the later study was conducted over a relatively shorter period of 10 weeks, utilizing patient samples recruited “consecutively.”

Schizophrenia is a psychiatric disorder more or less of young people, with the typical age of onset being in late adolescence or early twenties.^{22, 23}

A higher proportion of male respondents were found in this study. Similar findings have also been recorded in Nigeria, India, Germany and China.^{19,20, 21, 24} It has been traditionally held that schizophrenia has equal incidence and prevalence in both sexes. The onset of schizophrenia is earlier in males, with a slight delay in females.^{22, 23} This disorder is diagnosed in more men than women, with a male to female ratio of 1.4:1.^{25, 26, 27}

The extent to which patients were adherent to their prescribed medications was not significantly associated with age and gender. Age and gender of patients are apparently not significant bio-demographic correlates of medication adherence in schizophrenia. Studies are not in agreement on the nature, direction and strength of the relationship between these patient-related variables and drug adherence. While some reports suggest poorer adherence behaviour among younger patients,^{28,29,30}

others lack evidence or did not show any relationship between age and gender, and antipsychotic drug adherence^{31,32}. In a review, Fenton et al opined that demographic variables were not consistently associated with “compliance” in schizophrenia. Of the Eleven relevant studies assessed by them on the relationship between one or more patient demographic characteristics and compliance, eight of ten found no association with age and six of nine found no association with gender³³.

Islam is the major religion practiced by the indigenous people of our study community and indeed the Northern region of the country and has largely accounted for their higher proportion among the respondents. Religion was reported to be a predictor of adherence to treatment among patients with schizophrenia.³⁴ Religion and ethno-cultural beliefs about severe mental illnesses such as schizophrenia are crucial determinants of illness behaviour. Group and individual attitudes towards the experience of the disorder and its sufferers among our study population and indeed Nigerians in general could be stronger than imagined. There is an existing potent belief among adherents of the two major religions that schizophrenia is a condition incurred from evil forces and spirits, demons, sinful behaviour and nemesis. This results in the resort to spiritual help through the form of prayers and other non-orthodox methods of treatment. Empirical evidence reveals that patients with schizophrenia in this population often refuse or do not accept the use of medications because of the belief that they have or will receive spiritual healing, and the use of drugs undermine this power of God to heal them. Some studies reported that religion and religiousness is associated with better treatment adherence, whereas others suggest otherwise^{35,36,37}.

This study did not find a strong association between the knowledge that patients have about the side effects of the medications they were using and their willingness to use these drugs appropriately. Adherence is influenced by other factors that were not evaluated in the current investigation. Besides profile and severity of side effects, type and number of antipsychotics, gender, marital status, positive treatment attitudes, awareness of the need for treatment, receiving welfare and support with drug purchase, have all been found to influence drug adherence^{38,39,40}.

The findings of a high percentage of patients who had no knowledge about the potential side effects of their medications is of concern. This is at least to the extent that this dearth of information from physicians to patients deprives them the fundamental right to understanding the inherent risks of the doctor’s prescription and making an informed choice as to whether or not they prefer this mode of treatment, which reflects patient’s autonomy. Although, a lot has been done in understanding the critical issues of side effects and patients’ wellbeing, most of these studies have focused on its association with treatment variables such

as medication compliance behaviour⁴¹⁻⁴⁴. Research that specifically elicits the knowledge of side effects in patients with schizophrenia are very scanty. However, a study investigated the attitudes of consultant psychiatrists in three countries to informing their patients about the long-term risks of medication, in particular, tardive dyskinesia (TD). The proportion of Dutch, UK and Spanish respondents who indicated that they discussed the risks of TD with patients started on neuroleptics were 94, 87 and 70 percent respectively.⁴⁵ It is to be noted that this multicentre report is from a clinician’s perspective. In addition, it was based on all patients who received treatment and not specific to those with schizophrenia.

Over half of the patients on antipsychotics for schizophrenic disorder became knowledgeable about the side effects of their medications from sources other than the prescribing physician. This source was mainly by experiencing the effects themselves. Furthermore, it is instructive to note that almost all the patients were never given any information about side effects at the commencement of antipsychotic therapy. It wasn’t possible to determine the reasons for this lack of disclosure from the doctor’s perspective as this study was carried out among patient population who see different teams of psychiatrists during their clinic visits. Hopefully, this would be considered in future investigation. However, one could speculatively say the reason could be that providing such details to patients wasn’t routinely practiced as a standard of care at the clinics or doctors do not feel a sense of duty to do so.

Generally speaking, physicians are obliged to provide information to patients sufficiently enough to help them anticipate and or avert injury or potential harm from treatment. It is part of the principle of duty of care established decades ago that physicians have a general duty to take reasonable care to forestall harm to their patients⁴⁶. In some jurisdictions of the world, doctors are legally expected to take an informed consent for treatment.^{47,48} This is more so prior to administering antipsychotics, mainly because of their propensity to cause fatal or disabling side effects. For instance, the American Psychiatric Association recommends that patients on conventional antipsychotics be informed about the risks of tardive dyskinesia⁴⁹. However, just about fifty percent of psychiatrist follow this recommendation⁵⁰. The Mental Health Laws in Nigeria are archaic and obsolete at present and they grossly do not recognize the rights of patients⁵¹. If taking informed consent for treatment was part of the standard of care in the settings of the current study, patients would invariably be warned about potential side effects of their medications as part of facilitating their informed decision-making.

All patients sampled in this study were receiving conventional antipsychotics at the time of the interview. A previous report amongst same patient population had showed a very high preference for the use of first generation antipsychotics¹⁸. This may have been

because of the relative lower costs and availability of this group of drugs in the study community. Doctors' long term experience with the first generation drugs may also play a key role in this observation. In addition, patients or clinicians may also choose the typical antipsychotics over the atypicals due to their familiarity with the former. Following from this, are the associated side effects of this class of medications. The typical or conventional antipsychotics cause a wide range of adverse effects.^{52,53} However, fatigue and somnolence were the main problems reported by respondents in the current study. This may not necessarily reflect the overall burden of side effects on the patients as these symptoms are known to fluctuate in intensity in the same patient over time or vary in character amongst different people.

The presence of side effects in the respondents alludes to the need for psychiatrists to give information or warn patients about the likely problems that may result from antipsychotic use. Considering the troublesome nature of these side effects, patients' quality of care could be significantly improved by the simple provision of facts or details about the nature of treatment.

Importantly, by the very nature of schizophrenia, some respondents may have been oblivious of the presence of some side effects. Moreover, side effects were assessed by questioning, which was liable to forgetting, recall bias, under- or over-reporting. Perhaps an additional physical examination for side effects would have added strength to this study and will be considered in future.

Conclusion

The management of major mental disorders such as schizophrenia is largely through the administration of antipsychotics, which is often given for a long period of time. The use of these medications are associated with varied degrees of troublesome and rarely fatal side effects. This necessitates the need for the prescribing physician to provide information about the drugs to their patients so as to enable them participate knowledgeably in their management and make informed-decision about treatment. Findings from this study show that patients are indeed burdened by side effects of drugs given by their doctors, who rarely disclose to them the potential problems related to their use. It is a recognized standard of care in medical practice for physicians to take all necessary measures to protect their patients from harm or foreseeable injury. Although no statistically significant relationship was established between information receipt and adherence, information-sharing may be an important strategy to improving drug adherence. Therefore, future studies in this direction is advocated.

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COMMENTARY

MY EXPERIENCE IN CLINICAL PRACTICE AS A MEDICAL REGISTRAR IN THE UNITED KINGDOM (UK)

Summary

My experience working in the UK National Health Service (NHS) has been largely positive. Reflecting on my previous experiences makes me aware of the need for a standardised structure of practice to be put in place to guide the care of patients in Ghana as well as to ensure patient safety. There is still a lot that needs to be done in terms of the legal framework that guides medical practice in Ghana. Civil society groups and other medical groups should champion the enactment of laws on emergency care, patient safety, patient communication and patient involvement in their own care. Most of what I've discussed in this essay can be implemented with little to no resources

Introduction

I have been working at the Elderly Medicine Department of the Harrogate District Hospital since May 2017 with the Medical Training Initiative (MTI) Scheme. It has been a very good experience and it has exposed me to new and modern ways of taking care of patients. I was initially apprehensive as I was going to work in a totally new environment with a different culture and was wondering how I was going to settle in. The gradual introduction into clinical work at the Harrogate Hospital helped me to settle in. I initially observed patients being seen by different grades of doctors and then reviewed patients under supervision

me for the course and also allowed me to familiarise myself with the equipment and processes in my Hospital. In the UK, there are even defibrillators at particular areas outside health facilities which can be accessed when needed. People outside the health facilities are also trained in resuscitation.

The bleep/pager systems, emergency alarms, critical care outreach teams which are part of the British system all help to build the excellent emergency response system which they operate. However, the bleep system used in the UK can be improved as it causes a lot of distractions during on-calls especially as a registrar. The bleeps also do not show the urgency of the case for which the Doctor has been summoned. Without this, it is impossible to rationalise one's response and distraction is a norm. The NHS has been told to stop using pagers for communications by 2021, in order to save money. Health Secretary Matt Hancock called them "outdated" and said he wanted to rid the NHS of "archaic technology like pagers and fax machines" (2).

The UK's bleep system needs to be reviewed (2) and I have worked on a quality improvement project that has contributed to changes on how the bleep system is used at the Harrogate District Hospital.

before independently seeing patients. I also worked as a foundation doctor (house officer), then shadowed registrars (residents) before I eventually got on to the rota as a registrar.

Discussions

I will classify my experiences under these four headings:

Emergency care

One of the key tasks I had to complete before getting on to the rota was an Advanced Life Support (A.L.S) Course (1). For someone who thought his knowledge on A.L.S was good and had previously taught other professionals on the subject, I soon realised how intensive and well-organised resuscitation was in the UK (1). I also realised that my knowledge on the subject was not as adequate, thorough and standardized as I thought. The UK has a Resuscitation Council that supervises certification of A.L.S providers and ensures standard practice (1). The local hospitals also have their own Resuscitation teams that train all health professionals in the various hospitals. The local Resuscitation teams also audit resuscitation or crash calls to ensure standards are adhered to. Before participating in the UK A.L.S course, I had the opportunity to attend briefings organised by my host Hospital's Resuscitation team. This prepared

These systems are largely non-existent in Ghana. Some of these emergency responses like the critical care outreach services can be implemented in Ghana with little to no resources. The Critical Outreach Team consists of a team of nurses trained in resuscitation, how to review critically ill patients and liaise with on-call doctors and the High Dependency Unit (HDU)/Intensive Care Unit (ITU). One of the key things I have learnt working in the UK is making decisions about escalation and the level of care when seeing patients. This involves making a decision on whether to admit patients to HDUs/ITUs or to be managed on the ward (3). Critical decisions with respect to Do-Not-Attempt-Cardiopulmonary-Resuscitation (DNACPR) and escalation and having these difficult discussions with patients and family (4, 5) are made. Without many functioning HDUs/ITUs in Ghana, escalation to HDU/ITUs is not common practice and most patients are treated at ward level care. We need to teach our doctors and nurses on the levels of care i.e. Ward/ Level 0 or 1 care, HDU/Level 2 care and ITU/Level 3 care and how decisions are made regarding appropriate level of care when seeing patients especially unwell patients (6). These decisions involve good clinical judgement taking into consideration

patients' medical and social circumstances as well as their wishes (4, 5). Communication is one of the key differences between

the practice in the UK and what I had experienced in Ghana.

I can recall several discussions between the Management of the Hospital I that I worked for back home in Ghana and other colleagues on decongesting the Emergency Department. To begin with, the referral system in Ghana is not good as most patients simply show up at the various health facilities without any appointment. It is imperative that service providers efficiently use their bed space by ensuring seamless flow of patients through the various departments when they get to the hospitals and ensure that the available beds are efficiently used. There must be good bed management systems in place to ensure patients in emergency beds are quickly moved to the various wards to make space for new admissions. This will also ensure all sufficiently improved patients are quickly discharged to free bed space. Having a set time to discharge patients from the E.D which is set at four hours here in the UK avoids delays and frees up beds for emergency cases (7). However, my experience in the UK is that, there are times more emphasis is placed on avoiding a breach of the time than actually getting the patients in a better state before transfer to the various wards (7). The idea of a Bed Manager to liaise between the various wards and the emergency units is good and can easily be implemented in Ghana to ensure emergency beds are freed up. As a Medical Registrar in a UK hospital, I liaise with the E.D, Bed Manager, Nurse-in-charges and other team members to facilitate this. This system can be implemented in Ghana to address bed management issues. The National Health Insurance Authority together with other relevant stakeholders in the health sector in Ghana can set this four-hour window to move patients out of the E.D and incentivise health facilities that meet the target(s).

Due to a heavy load of patients and a significantly lower doctor-to-patient ratio, communication with patients is very poor in Ghana. This doesn't allow patients to actively partake in decisions regarding their own health (3). Research shows that patient participation in decisions regarding their care ensures better patient care (3).

Patient safety

Though there are legal and professional Guidelines or protocols to ensure patient safety, adequate supervision and teamwork is important to achieve this. Consultants in the UK make sure they see almost all cases under their care and have well laid out plans for them. There is a clear structure of responsibility and greater support for junior doctors. The Consultants are more actively involved in the management of patients under their care. This is a practice that I have learnt in the UK and will incorporate into my future practice to ensure that I take full responsibility for patients under my care and make sure that junior doctors working under me get the required support. In the UK, all team

members (including non-clinical staff) contribute towards patient safety by ensuring everybody supports each other. The working of a Multidisciplinary team (MDT) is integral in the practice in the UK (8). An MDT meeting is, for instance, organised every morning on the Elderly care wards here at the Harrogate District Hospital. During this meeting, different specialties like doctors, nurses, physiotherapists, occupational therapists and discharge coordinators discuss the various cases and what actions are needed for the day. During these meetings, expected dates of discharges are set and this puts the whole team on its toes to ensure speedy discharges and efficient care and use of bed space.

The use of the Datix tool (software to report clinical incidents) to ensure patient safety and quality standard of care is another useful experience especially when it operates in an environment of openness, accountability and improvement. Datix is an electronic tool to report issues that compromise patient safety and care. A culture to encourage learning from mistakes and reflection on events must be encouraged (9) in Ghana. I remember having to respond to a Datix query because I requested a Magnetic Resonance Imaging (MRI) for the wrong patient. This happened on a busy day when I was shuffling between wards and multi-tasking. My initial thoughts were: "this is harsh; after all this was detected early and the patient wasn't even sent for the MRI". But on reflection, I realized the waste of time and resources to identify and rectify this mistake plus the potential and risks to have imaged the wrong patient. The checks and balances in the system ensured that the wrong patient wasn't imaged. This has made me more careful when requesting investigations; I now double-check and make sure my requests are for the right patients (9). Audit and quality improvement projects are useful ways of contributing to patient safety and improving quality of care. I was involved in the audit of a post-falls pro-forma form which is currently being rolled out throughout the Harrogate and District NHS Foundation Trust here in the UK.

We need to implement the MDT culture in Ghana and ensure more efficient use of our human resources and ensure quicker discharges. A culture of audit and quality improvement must be inculcated and must be a requirement across the health system. All trainees should be expected to draft and implement an audit or quality improvement project during their training.

Legal framework to guide practice

During my orientation both by the Trust and the Department of Elderly Medicine, I got exposed to the various legal frameworks for practice in the UK. Being an elderly care registrar has been extremely helpful in my ability to work on the rota in the U.K as it allowed almost daily exposure and learning about some of these concepts, i.e. safeguarding, Deprivation Of Liberty Safeguarding (DOLS), capacity assessment, end of life/palliative care, DNACPR, escalation decisions and so on (5, 10). The absence of these concepts backed by explicit laws back home in Ghana compromises our

health care since these are “grey” areas. Those of us in the medical profession must partner civil society groups in Ghana to fight for a proper legal framework to back some of these issues or concepts.

Standardized care and training

Another issue that I have really appreciated whilst working in the UK as a Medical Registrar has been the standardisation of patient care and the training of caregivers. The National Institute for Health and Care Excellence (NICE) guidelines allow for a more standardized care across the whole of the UK. The protocols in the NICE guidelines are used for training and set the standard of care required for various conditions across the UK. Exams questions at the various stages of undergraduate and postgraduate training are also based on these guidelines. My host Hospital in the UK also has locally generated protocols on many conditions online and this also allows for easy referencing and standardises the care. In the UK, the use of an electronic e-portfolio (electronic logbook) that is easy to verify and monitor is an excellent way of ensuring trainees receive adequate training and acquire the competencies needed. I've found the e-portfolio extremely useful as it allows me to know where I am with respect to my Personal Development Plans (PDPs) as discussed with my supervisors. Through the use of a multisource feedback form in the e-portfolio, I have received feedback from the different people that I have worked with in both clinical and non-clinical areas. I have also received feedback from some patients that I have seen (11).

Whereas Ghana has the Standard Treatment Guidelines that seek to guide the work of doctors and the National Health Insurance Authority, the information is sparse and the information is not reviewed regularly (12). The protocols in the Standard Treatment Guidelines are not reviewed frequently in line with changing practice and local guidelines.

The protocols of the Standard Treatment Guidelines should be used to teach medical students and residents and should be the standard of care expected for patients seen in Ghana. This will standardise care across the country and ensure all patients no matter where they are in the country are given a certain expected care with clear indications for referrals. A patient with a heart attack in Techiman should receive the same care as one in Kumasi.

In Ghana, most hospitals have mainly paper-based protocols pasted somewhere in the hospital in the various departments. However, these are not exhaustive and mostly, for lack of space, cover few conditions. This means that care basically depends on the knowledge of the doctor who sees the patient at that time of reporting with various doctors choosing to treat similar conditions in different ways. Hospitals should digitise and develop local online treatment protocols to allow ease of access. The Government of Ghana's plans to use more computer based technology in hospitals should help facilities to implement this. We

should also take advantage of technology to synchronize the medical records of patients to allow ease of access anywhere in the country.

The Government can set up Foundation Trusts as is done in the UK and have all health facilities in a particular area put under one Trust (13). This will allow efficient use of resources, human and equipment, with laid down referral systems between facilities in the same Trust and those outside it. This will allow the Government to save on provision of equipment and human resource. It will also allow patients to have access to specialist services and equipment within a Trust with ease of movement in between health facilities within a Trust.

In Ghana, a physical log book is used to record the practical training of residents but this lacks all the advantages of an electronic system. The log book of trainees in Ghana must allow feedback from various people working in the hospital even those in non-clinical areas so that trainees receive a comprehensive feedback from everyone they work with and not just from doctors, as the case is now. This will allow overall growth and better team working.

Furthermore, the log book doesn't allow for a more personalized development plan. I've found reflection(s) on incidents, meetings and clinical cases useful (9). Medical trainees need to reflect on events, mistakes and attachments to various units in order to build a spectrum of useful experiences. We should also encourage trainees to agree on PDPs with their supervisors/teachers and work towards them.

I will in future make quality improvement projects or audits mandatory for all trainees under my care back home. This allows health facilities to improve and also build other non-clinical competencies in trainees like leadership, management and research.

List of abbreviations

1. ALS- Advanced life support
2. DNACPR- Do not attempt cardiopulmonary resuscitation
3. DOLS- Deprivation of liberty safeguards
4. ED-Emergency department
5. HDU-High dependency unit
6. ITU- Intensive care unit
7. MDT- Multi-disciplinary team
8. MRI- Magnetic resonance imaging
9. MTI- Medical training initiative
10. NHS- National Health Service
11. NICE- National institute for health and care excellence
12. PDP-Personal development plan
13. Resus- Resuscitation area

Definition of terms

1. DNACPR-A do-not-resuscitate order, or DNR order, is a medical order written by a doctor. It instructs health care providers not to do cardiopulmonary resuscitation (CPR) if a patient's

- breathing stops or if the patient's heart stops beating (4, 5).
2. Deprivation of liberty safeguards-Deprivation of Liberty Safeguards (DoLS) Provides protection for vulnerable people who are accommodated in hospitals or care homes in circumstances that amount to a deprivation of their liberty and who lack the capacity to consent to the care or treatment they need (10).
 3. Advanced life support-a set of life-saving protocols and skills that extend Basic Life Support to further support the circulation and provide an open airway and adequate ventilation (breathing) (1).
 4. Capacity assessment-The Mental Capacity Act (MCA) is designed to protect and empower people who may lack the mental capacity to make their own decisions about their care and treatment. It applies to people aged 16 and over (10).
 5. Multidisciplinary team-A multidisciplinary team is a group of health care members in different disciplines, each providing specific services to the patient with the aim of ensuring that the patient receives optimum care and support (8).
 6. Foundation trust- An NHS foundation trust is a semi-autonomous organisational unit within the National Health Service in England. They have a degree of independence from the Department of Health (and, until the abolition of SHAs in 2013, their local strategic health authority (13).
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SPECIAL ARTICLES**STORAGE FACILITIES FOR THE DEAD IN GHANA****Anim JT****Summary**

The distinction between a mortuary and a funeral home appears blurred to the average Ghanaian who readily considers any storage facility for human corpses in Ghana as a mortuary. Added to this is the fact that virtually all such storage facilities are to be found in hospitals in Ghana. Only a few funeral homes are found in this country and even some of these are beginning to take on the role of a mortuary. This paper defines and addresses the differences between the two facilities and

also discusses the need to encourage the construction of community/public mortuaries with the view to shifting the responsibility of administering such community mortuaries from the hospitals, in line with best practices elsewhere. This would enable the hospital pathology service to play its traditional role of diagnosis of diseases in living patients, while also ensuring adequate manpower development by other relevant agencies to fulfill the mandate of the Coroner's Act, 1960 (Act 18).

Key Words: Mortuary, Funeral Home, Community/Public, Pathology service

Introduction

It is common knowledge that Ghanaians fuss a lot about their dead. This largely, stems from traditional beliefs concerning the dead and their purported influence on the living. Thus, virtually all ethnic groups in Ghana believe in honouring the dead so that in turn, the spirit of the deceased would favour them in life. It is for this reason that the spirits of the dead ancestors are invoked during various traditional ceremonies, for the purposes of seeking their protection or guidance. Thus, elders in the society or traditional heads and priests who are regarded as custodians of traditional practices are revered in such societies. The sacred place reserved for the dead in Ghanaian societies has influenced our handling of the body of the deceased.

In the not too distant past, because of difficulties in preserving dead bodies, most ethnic groups in Ghana buried their dead shortly after death and held more elaborate funerals at a later date agreed upon by the family. Most often, the date for the funeral was determined by financial considerations, as well as time required to notify all relatives and sympathisers. With modernisation however, and availability of refrigeration and storage facilities, it has become fashionable to store bodies for as long as necessary, to allow all funeral activities to be planned for and executed all at once. Hence, the incessant and sometimes interminable requests by Ghanaians for storage facilities. In the

process, providing storage facilities for dead bodies has become a very lucrative venture, unfortunately, with little or no guidance as to who should provide such facilities or where they can be sited and who should monitor activities in such facilities. There are definite health, as well as legal dimensions to providing these facilities that must be addressed urgently, in order to avoid the usual Ghanaian syndrome of ignoring a problem until it becomes difficult to deal with its consequences. I am aware that a law has recently been passed to regulate the setting up and operation of such facilities, but is not yet fully operational. Its appropriate implementation forms part of the discussion in this paper.

TYPES OF STORAGE FACILITIES FOR THE DEAD

In the modern, largely urbanised societies of Ghana, dead bodies are no longer kept at home. They are usually promptly transported to a storage facility which is usually a mortuary, but also more recently, a funeral home. These are two distinct storage facilities, but in Ghana the differences are not known to many people. One can ascribe this to ignorance on the part of the general populace. I am personally aware that most well educated Ghanaians cannot tell the difference between the two, except for their location. For some reasons mortuaries in Ghana are found almost exclusively in hospitals, while funeral homes are privately owned and therefore, located outside the hospital. From that point of view, many people can tell the difference. However, when it comes to the exact functions of these two storage facilities, not many people are aware of important differences. This short communication is an attempt to highlight the differences and related matters, between the two types of storage facility for human corpses.

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The Mortuary

A mortuary is defined according to Wikipedia as: *A place in a hospital or elsewhere used for the storage of human corpses awaiting identification or removal for autopsy or disposal by burial, cremation or other method.* It further states that: *In modern times, corpses have customarily been refrigerated to delay decomposition*¹. The purposes for storage have been captured in the definition. Key among them are: identification of the deceased and for conduction of an autopsy if required. The above definition of a mortuary does not differ much from that provided in the Health Institutions and Facilities Act 2011 of Ghana (Act 829, Part 2 – Mortuaries and Funeral Facilities Agency (Section 57). This states that: *a mortuary means premises with equipment for autopsy and cold storage where human remains are kept until disposal*². The essence of an autopsy in such premises, is to determine the cause of death, in order for a cause of death certificate to be issued prior to obtaining a permit for disposal (burial, cremation or other). I have described in detail, the two main categories of deaths in any society which may also determine where a mortuary may be sited and who is responsible for administering it³. Because the mortuary, apart from providing storage facility, also serves as a place for an autopsy to be carried out, it must be clearly distinguished from a funeral home.

The Funeral Home

A funeral home simply serves as *a place where corpses are prepared for disposal (burial, cremation or other)*¹. More often, added facilities are provided for further preservation of the body through embalment and refrigeration. Again this definition is not different from that provided in Act 829 cited above. The Act defines a funeral home as: *“premises with or without cold storage facility for human remains where preparations for burial are made”*². It is clear from the above definitions that autopsies are not to be carried out in funeral homes. Depending on the customs of the society, some funeral homes provide extra facilities such as, a Chapel (or Mosque or Temple) for appropriate religious ceremonies prior to disposal of the body. It has become fashionable or convenient in Ghana for some funeral homes to even provide space and facilities for holding the entire funeral ceremony on the grounds. More recently, some funeral homes in Ghana, in addition to the facilities mentioned above, have attached nearby burial grounds to serve as a one-stop shop for the convenience of relations of the deceased.

A major difference between the two facilities (Mortuary and Funeral Home) is that the mortuary is a place where the necessary investigations are carried out prior to the issue of a cause of death certificate. These include: identification of the corpse by next of kin or any appropriate person and the autopsy examination to ascertain the cause of death. In this regard, it is advisable not to attempt further preservation of the body through embalment or any other form of preservation, as such procedures often interfere with and may render the autopsy results inconclusive. This may have very

serious consequences in medico-legal cases, especially in the investigation of unnatural causes of death such as homicide, suicide or even accidents and misadventure where blood samples or other body fluids for toxicological or other investigations may be deemed essential. In contrast, bodies sent to a funeral home must have cause of death certificate already issued, or better still, must have a burial permit already issued. For this reason, administrators of funeral homes are advised not to accept bodies for preparation for disposal without any of the documents stated above. It is therefore, important in Ghana, to clearly differentiate between the two types of storage facilities available for corpses. It is known that relatives of the deceased often demand and pay for embalment of their dead as soon as they are deposited in a mortuary or a funeral home. This often results in illegal embalment of bodies even before the Coroner has decided whether or not to authorise an autopsy on the body. Storage of corpses in funeral homes, before a cause of death certificate is made available must be discouraged for the above reason.

Some funeral homes in Ghana have taken on the additional role of offering facilities for autopsies to be conducted on their premises. This seems not to be in accordance with the provisions of Act 829 as specified in the definitions given above and contrary to best practices as observed in other parts of the world, for the simple reason that it blurs the distinction between the two facilities (funeral home and mortuary). The two must be clearly distinguished in order to ensure their efficient administration.

LOCATION OF THE MORTUARY

In most countries and as implied in the definition of a mortuary provided above, there are two main types of mortuary namely as determined by their location: *hospital mortuary* and *public or community mortuary*.

1. Hospital Mortuary

A hospital mortuary, as the name implies, is a necessary part of a hospital because, regardless of the degree of sophistication in the facilities available in the hospital, or the level of expertise of the medical personnel, some terminally ill, or critically ill patients admitted to the hospital do die. The bodies of these deceased patients are stored in the hospital mortuary pending the issue of a cause of death certificate, or an autopsy, where this is deemed necessary. Hospital autopsies, in addition to determining the cause of death, are also useful for deeper understanding of the processes leading to death of the deceased and thus, are used for the purposes of teaching or advancement of medical science. In these cases, permission is usually sought from the next of kin or relevant family members for the autopsy to be carried out by the hospital pathologist. It must be stated that for many hospital deaths, the cause of death may already be known to the clinical team and autopsy is only required for the other reasons stated above, or for harvesting organs for transplantation where authorisation for this has already been made. Because hospital autopsies are done by the hospital pathologist, hospital mortuaries are

an integral part of the hospital pathology department and are administered by the pathology department. As not many deaths occur in any single day in any hospital, hospital mortuaries are usually small and provide storage facilities for a dozen or so bodies. It is assumed that following the autopsy or the issue of cause of death certificate where an autopsy is not required, the body can be transferred to a funeral home to be prepared for disposal. In reality therefore, hospital mortuaries are not meant to be used as storage facilities for bodies beyond what has been stated above. The hospital pathologist thus, does only a few autopsies each week and is therefore, able to devote more time to diagnostic histopathology and cytopathology service for the management of living patients. As hospital autopsy load has decreased worldwide over the years, so the depth and complexity of pathology diagnostic methods have grown, necessitating the shift of the attention of the hospital pathologist from performing autopsies to diagnostic and other clinical functions.

Unfortunately in Ghana, this is not so. In the absence of adequate storage facilities outside the hospital mortuaries, relations of the deceased and also officers investigating deaths in the community have found in the hospital mortuary a repository for all manner of dead bodies and a place where they can keep them indefinitely until funeral arrangements or investigations, as the case may be, have been completed. This may take weeks, months and sometimes, years. Hospitals in Ghana have responded to this anomaly by providing more storage space and charging storage fees as an avenue for income generation. Sadly, most hospitals in Ghana with large mortuary facilities lack other basic items that are essential to their core mandate of health care delivery. Many hospitals that have expanded their mortuary storage facilities in Ghana lack emergency health care facilities, which ought to be their focus in modern health care delivery. It is not uncommon for such hospitals to turn away critically ill patients requiring emergency care with the excuse that there are no emergency care facilities, only to readily accept their dead bodies because body storage facilities are available for a fee. I have a personal experience of a close relative suffering this fate. This cannot be the right health care delivery strategy for hospitals in a seemingly progressive country like Ghana. Availability of functional, comprehensive emergency service in hospitals in Ghana has become more relevant with the recent provision of over 300 modern ambulances to all constituencies in Ghana.

2. Public/Community Mortuary

Most countries in the world have in addition to hospital mortuaries which are usually small, as stated above, separate mortuaries located in the communities. These are known as public mortuaries or community mortuaries and are administered either privately, or by the local authority. The purpose of this type of mortuary is to serve as a repository for all deaths occurring in the community, outside the hospital. Many more deaths occur in the community than in the hospital. These

deaths, in addition to natural causes of death, include deaths from homicide, suicide and any form of accident or misadventure. The latter group of deaths are usually deaths that must be notified to the Coroner and for which the Coroner may authorise an autopsy to be carried out. Like the hospital mortuary, such mortuaries must have facilities for an autopsy as stated above in the definition of a mortuary. The Coroner may authorise any qualified medical practitioner to carry out an autopsy on the deceased for a prescribed fee as stated in the Coroner's Act of 1960 (Act 18)⁴. In other countries, trained forensic physicians or forensic pathologists are available to assist the Coroner in the investigation of such deaths. As at now, there are no clearly designated public or community mortuaries in Ghana. It is a mystery why this standard administrative provision for the handling of the dead that has successfully been applied in many countries has been so ignored in Ghana.

I am reliably informed that in the days of the Colonial Administration of the then Gold Coast, there were public mortuaries in Accra and Kumasi. For some reasons these public mortuaries have been abandoned. Instead, all deaths in the communities are sent to the nearest hospital mortuary for storage. Because hospital mortuaries are customarily administered by the pathology department of the hospital, all deaths from the community that are deposited in the hospital mortuary, by default become the responsibility of the pathology department. A vast majority of such deaths fall in the jurisdiction of the Coroner and constitute a distraction to the hospital pathology department. This unfortunate distraction from effective diagnostic pathology service in Ghana has been discussed at length in another article⁵.

HEALTH INSTITUTIONS AND FACILITIES ACT, 2011 (ACT 829) – Part Two: Mortuaries and Funeral Facilities Agency².

The Act to govern the establishment and running of mortuaries and funeral homes in Ghana was originally passed in 1998 (Act 536). It has subsequently been replaced by Part two of Act 829 of 2011. It provides a framework for the establishment of a Board to control and regulate the establishment of mortuaries and funeral homes (Sections 28-31).

In addition, it provides for the establishment of Zonal Committees by the Board to supervise the establishment and running of these facilities at the district or community level (Section 32 et seq). Whereas it clearly differentiates between a mortuary and Funeral Home as discussed above, there is no clear separation between the hospital and community mortuaries, the main focus of this paper. Section 57 specifies the Sector Minister as the Minister responsible for Health who is required in Section 56 of the Act by legislative instrument, to make specific regulations to govern the activities in the said facilities. In my view this may pose some difficulties, considering that administration and activities of the facilities in question span the jurisdiction of several sectors and departments of government, notably: Ministry of Local Government and Rural Development, Ministry of the Interior and the Judicial Service, as

detailed later in the conclusion of this paper. Even the Ministry of Environment, Science and Technology is involved when it comes to considering the impact of the facility on the environment in the issue of a permit for its establishment. The Ministry of Health of course, should be responsible for the hospital mortuary as an integral part of the respective hospitals but the Minister's role in the administration of the facilities in the Zonal and Community levels is limited to providing Public and Community health oversight. In spite of these reservations, the Act is a commendable effort to establish guidelines for a potentially growing industry in Ghana and where there is likely to be much confusion if care is not exercised. This paper raises these points, in order to enhance discussions on this complex issue, to guide the processes involved in the implementation of Part Two of Act 829.

I am aware that following the refurbishment of its old mortuary and the addition of extra mortuary facilities, the Greater Accra Regional Hospital (Ridge Hospital in Accra) can now boast of a mortuary with body storage capacity in excess of 300. Information available indicates that the only pathology service currently rendered in the pathology department of that hospital is autopsy service, the bulk of which is medico-legal and nothing to do with diagnostic pathology service and its role in health care delivery in a hospital. I am aware that arrangements are only now being made to provide diagnostic pathology service. A Regional Hospital being a referral centre should have a well-equipped, adequately manned and functioning diagnostic pathology service. It is also hoped that the modernisation exercise has taken into account the changing face of medical practice and provided a well equipped emergency centre with comprehensive facilities for the benefit of the living, as recommended in an earlier editorial of this journal⁶. My view is that a hospital the size of the Greater Accra Regional Hospital does not need that size of mortuary facility for its hospital service.

Similarly, even with its large size and bed capacity in excess of 1,000, Korle Bu Teaching Hospital does not need a hospital mortuary for bodies in excess of 100. Its mortuary currently accommodates over 500 bodies, about 90% of which are from outside the hospital. I am aware that Komfo Anokye Teaching Hospital in Kumasi has also recently expanded its mortuary capacity. The list goes on, but these are only a few examples of the current state of affairs, with regards to storage of human remains in Ghana that must be re-examined.

It would appear that the administrators of the Health Service of Ghana are either unaware or complicit in the exercise of expanding mortuary facilities in hospitals across the country, ostensibly to accommodate the ever increasing numbers of dead bodies, majority of which come from outside the hospitals. Even the privately owned hospitals and health facilities of various religious bodies have not been left out of this race.

It is my view that this exercise is completely misplaced and that the Health Sector is taking on the functions that could more effectively be undertaken by another State

Agency namely, the Ministry of Local Government and Rural Development, while neglecting to upgrade its own virtually non-existent emergency service in majority of its hospitals.

Conclusion

It is worth reiterating that the relevant state agencies must be made aware of their responsibilities and resourced to take over relevant responsibilities in order to ensure the smooth running of different services in the country. For efficient implementation of the Coroner's Act - 1960 (Act 60) and the Mortuaries and Funeral Facilities Agency - 2011 (Act 829 – Part 2), it is my submission that there must be clear separation between hospital and community/public mortuaries. This requires a clear paradigm shift and a willingness to depart from our old ways of doing things and adopt newer, more efficient methods. Undue emphasis on income generation by hospitals from mortuary services must give way to strengthening of health care delivery strategies for the benefit of living patients. The agencies required for delivery on the mandate of the above Acts must include:

1. Ministry of Local Government and Rural Development: To ensure the construction and efficient administration of Public or Community Mortuaries by the respective Metropolitan, Municipal and District Assemblies (MMDAs) to enable the Zonal Mortuary and Funeral Facilities Committee to carry out its mandate as provided in Act 829, Section 32.
2. Ministry of Interior: To oversee the setting up of a modern Forensic Service in the country. This includes training of investigating officers, recruitment and training of Forensic Scientists, recruitment and training of Forensic Physicians or Forensic Pathologists and training of other staff to form a comprehensive Forensic Team. This may require the setting up of a National Forensic Institute.
3. The Judicial Service: To ensure that District Magistrates who are the designated Coroners of this country are adequately trained to carry out their statutory functions in accordance with the Coroner's Act of 1960 (Act 18).
4. The Ministry of Science, Technology and Innovation: To ensure that its personnel are involved in assessing the environmental impact on the siting and operational activities of Community/Public Mortuaries and Funeral Homes in the respective communities.
5. The Ministry of Health: To provide Public Health personnel in the implementation of Act 829 at all levels.

Considering the number of agencies listed above, the establishment of an inter-ministerial body could facilitate the implementation of the provisions of the Mortuaries and Funeral Facilities Agency under Act 829. The above recommendations will also ensure that dead bodies are handled properly by the appropriate personnel, under prescribed laws and regulations. They

also encourage the Ministry of Health to divest itself of the extra burden of providing accommodation for deaths outside the hospitals, beyond the needs of the respective hospitals. Finally, they will ensure that delivery of justice is streamlined and hospital personnel are left to provide good quality health care to patients.

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NEED FOR A SURGICAL PLAN IN GHANA

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Introduction

Over the past two decades, the global health community has increasingly recognised the need to include surgery, obstetric and anaesthesia care (SOA) in its concept of universal health coverage in any national plan¹.

Surgical conditions (including obstetric conditions) represent a leading contributor to the global burden of disease accounting for a third of all disability-adjusted life years (DALYs) incurred annually². In the study published by the Lancet Commission on Global Surgery (LCoGS), it is stated that about five billion of the world's 7.5 billion people do not have access to safe and affordable surgical, obstetrics, trauma and anaesthesia care when needed².

Among those who are fortunate to have surgery done, 33 million will face catastrophic health expenditure due to payment for surgery and anaesthesia each year². This fact is ever so true for most low-and middle income countries (LMIC) and the Lancet Commission has proposed the use of six core indicators to assess the surgical system of a country³. These indicators include specialist surgical workforce per 100,000; number of surgical procedures per 100,000; risk of catastrophic expenditure for surgical care; risk of impoverishing expenditure; postoperative mortality rate and 2-hour access to Bellwether procedures. Of these six indicators, four have been published by the World Bank as World Development Indicators (WDIs).

Current Surgical status

Even though the healthcare system in Ghana has received a lot praise, when compared to other LMICs the surgical status has little to boast about. Most Ghanaians can reach a healthcare facility within 2 hours⁴. A significant proportion of these public healthcare centres (aside from the tertiary hospitals) have the minimal infra-structure to provide emergency and essential surgical care,⁵ but there is a substantial shortage of adequately trained surgeons who can perform surgical and obstetrical procedures at first-referral facilities^{6,7}.

Recent WDIs indicated that the risk of impoverishing expenditure for surgical care in Ghana

was 23.8%, which is close to the average for Middle Income countries (25%)³.

Looking at it from an obstetric standpoint, the few successes hailed are not always reflected in health outcomes for women and children. Ghana ranked near the bottom, at 154 out of 179 countries assessed in the annual State of the World's Mothers report that assesses lifetime risk of maternal death and under-five mortality⁸. Maternal mortality rate is still high at 319 per 100,000 live births, far higher than the Sustainable Development Goal of 70 deaths per 100,000 live births⁹. Nearly half of maternal deaths in Ghana occur within 24 hours of birth and are largely a result of care-seeking delays and inadequate medical care¹⁰.

Current Plan

In comparison with other low-income countries in the sub-region, Ghana stands out because of the introduction of the National Health Insurance Scheme (NHIS) and reforms made by the Ministry of Health (MOH) in 2012.

The NHIS has played a very crucial role in the MOH moving towards their second objective of ensuring a sustainable financing for health care delivery and financial protection for the poor. With over 40% coverage, the major priority has been decreasing the out-of-pocket costs for patients who receive inpatient and outpatient hospital care (including surgical care).

The Ministry of Health (MOH) developed the Holistic Assessment Tool which was designed to offer stakeholders the opportunity to dialogue on sector performance within an agreed framework¹¹. It was a departure from assessing a basket of few indicators and generalizing such performance as representative of the whole sector.

This approach is very similar to the recommended Lancet Commissions' roadmap that aims to (1) reflect priorities of SOA system stakeholders, in particular frontline providers; (2) set ambitious yet attainable goals within the given timeframe and resources; (3) align with broader national health priorities; and (4) encompass activities of all actors spanning the public, private and non-governmental sectors. Unfortunately, out of the six main objectives and fifty-four specific targets laid out by the Holistic Health Sector Development Plan, there was no target that specifically addressed the surgical needs of the nation¹¹.

Roadmap to NSOAP

The recommended roadmap by the Lancet Commission on Global Surgery focuses on improving SOA care delivery across six domains of the health

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system: service delivery, infrastructure, workforce, information management, finance and governance.

To date, twenty-three countries including Ghana, have committed to developing a National Surgical Obstetric & Anaesthesia Plan (NSOAP), but only four of them have completed the assessment and implementation of such a plan¹². With help from the Harvard Medical School Program in Global Surgery & Social Change (PGSSC), numerous templates and recommendations were proposed on how to go about achieving an NSOAP. In March 2018, during the first NSOAP workshop held in Dubai (United Arab Emirates), they recommended eight key steps which included: Ministry/Government support & ownership; situational analysis and baseline assessment; stakeholders' engagement; drafting & validating; monitoring and evaluation; costing; governance; and finally implementation.

From the experience gathered from all the four nations that had successfully developed an NSOAP, the most important rate-limiting step was gaining Ministry support and ownership.

To achieve this, local experts in the field of surgery, obstetrics and anaesthesia who understand the need for scaling-up of SOA care can best engage MOH leaders to generate a realistic and well-informed plan which can be integrated into the already existing NHPSP.

In conclusion, surgical care delivery over the last two decades has not been a priority in most LMICs. This is partly true because surgical conditions were not factored into the Millennium Development Goals (MDGs) which directed most national health agendas during that period. With the current SGD focusing on Universal Health Care and recognizing the need to strengthen emergency and essential surgical care & anaesthesia, there is hope that this narrative will change.

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CASE REPORT

A CASE REPORT ON EXCORIATION DISORDER AND TYPE 1 HYPERSENSITIVITY; A DISTRICT HEALTH FACILITY-BASED STUDY

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Abstract

Excoriation disorder (ED) or psychogenic excoriation is a "repetitive and compulsive picking of skin which results in tissue damage" characterized by an obsessive-compulsive spectrum mental disorder with a repeated urge or impulse to pick at one's own skin to the extent of causing psychological or physical damage.^{1, 2} Prevalence of this condition is unavailable in developing countries of the world. It is classified as "L98.1 Excoriation (skin-picking) Disorder" in ICD-10 and referred in some literature as "*dermatillomania*". ED is characterized by, but not invariably, the compulsive urge to pick, squeeze or scratch skin surfaces experienced by patients. Commonly picked parts of the body include the face (most picked), arms, legs, back,

gums, neck, shoulders, scalp, abdomen, chest, the knuckles (via mouth leading to temporary disfiguration of distal and proximal joints of the middle and little fingers) and other extremities e.g. the fingernails, cuticles, and toe nails;⁵ skin picking may be accompanied by anxiety with depression following picking.⁵ It is often triggered by factors that include feeling or examining irregularities on the skin, feeling anxious etc. Complications include infections, tissue damage and sepsis. Rarely, severe cases cause life-threatening injuries. Risk of self-harm is increased by feelings of intense helplessness, guilt, shame and embarrassment.⁸ Studies further describe significant associations between ED and suicidal ideation, suicidal attempts and psychiatric hospitalizations.

Key Words: *Excoriation, hypersensitivity, disorder*

Introduction

Excoriation disorder (ED) or psychogenic excoriation, defined as "repetitive and compulsive picking of skin which results in tissue damage",¹ is an obsessive-compulsive spectrum mental disorder characterized by the repeated urge or impulse to pick at one's own skin to the extent of causing psychological or physical damage.² It was formerly classified as an "Impulse Control Disorder" (f63)" and currently classified as "ICD-10 L98.1 Excoriation (skin-picking) Disorder" in ICD-10 (or factitial dermatitis/neurotic excoriation or *Dermatitis factitia*).³

Excoriation disorder also referred to as "*dermatillomania*" for some time is currently classified as a separate condition under "Obsessive Compulsive and Related Disorders" and is termed "excoriation (skin-picking) disorder" as of the release of the fifth Diagnostic and Statistical Manual of Mental Disorders in May 2013.³ ED, until recently, did not have a specific listing in the ICD coding guidelines and was sometimes coded under factitial dermatitis (Neurotic excoriation) –

(Code: 98.1).⁴ It is however currently added, as a new category, under OCD (Code: 42.4) since the latest DSM-5 current as of 1st October 2017 by the World Health Organisation (WHO).⁴ The ICD-11, published 2018, categorises ED under Body-focused repetitive behaviour disorders which sits under Obsessive-compulsive or related disorders.⁴

Similarities between ED and *trichotillomania* (the uninhibited urge to pull on one's own hair) are established in extant evidence base by researchers; they both have ritualistic symptoms without any preceding obsessions, similar triggers for the compulsive actions, similar age of onset, high level of co-morbidity between them and appear to importantly modify arousal levels of patients.⁴ Skin picking, characteristic of ED, is dominated by females and this comprises a notable difference with trichotillomania which is more evenly distributed across genders.⁵ ED is a type of Obsessive Compulsive Disorder (OCD) on the basis of "repetitive engagement in behaviors with diminished control" which reduces prior anxiety.¹ ED and OCD however further fundamentally differ as follows: as explained above, ED is largely experienced by females and may be inherently pleasurable while OCD, on the contrary, is not.¹ Treatments that are generally effective for patients with OCD (i.e. Selective Serotonin Reuptake Inhibitors - SSIRs and Exposure Therapy) are not as successful in patients with excoriation disorder.¹ Picking of skin in ED is very rarely driven by obsessive thoughts unlike OCD.¹ Odlaug and Grant have however documented

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similarities that include compulsion to engage in the negative behavior despite knowledge of the harm, lack of control over the problematic behavior, strong urge to engage in the behavior prior to engagement, feeling of pleasure while engaging in the behavior and a feeling of relief or reduced anxiety after engaging in the behavior.¹

ED is characterized by, but not invariably, compulsive picking of the knuckles (via mouth) leading to temporary disfigurement of distal and proximal joints of the middle and little fingers, *dermatophagia*, often preceded or accompanied by anxiety.⁶ Feelings of depression may however follow picking.⁵ Episodes are commonly characterized by a compulsive urge to pick, squeeze, or scratch at a surface or region of the body, often at the location of a perceived skin defect and this may result in a sense of relief or satisfaction.⁶ Regions of the body typically picked are face (most picked),^{1,6} arms, legs, back, gums, neck, shoulders, scalp, abdomen, chest, and extremities e.g. fingernails, cuticles, and toenails.³ This case report aims to describe ED in a female patient attended to at the Kade government hospital (in the Eastern Region, Ghana) triggered by skin eruptions that the patient experiences typically around the period of her menses. The study was carried out with full signed consent of the patient (i.e. without coercion) after she was educated on what comprises a case report and how the case report would be devoid of identifying variables that could render the patient traceable.

Case Report

A 38 year old female married with 2 children, a general nurse by profession, reported with several episodes of acute attacks of bronchial asthma to a district hospital. She reported experiencing recurrent acute attacks of bronchial asthma since late childhood and through adolescence. Acute attacks were largely amenable to the use of salbutamol inhalers though they sometimes warranted in-patient management at the hospital with nebulized salbutamol, parenteral steroid administration and administration of antibiotics as and/or whenever deemed appropriate for the empirical management of a suspected underlying trigger. *The patient recounted growing up under authoritarian parents.* Her family history indicates that her father had bronchial asthma on account of which he experienced several severe acute attacks while her mother was on routine treatment for essential (idiopathic) hypertension. She has four elder male siblings among whom the second also had recurrent episodes of acute attacks of bronchial asthma as a child.

Her other siblings however occasionally experience itching and generalized pruritic sensations with intermittent development of skin eruptions and rhinitis.

The patient further explains experiencing occasionally severe attacks of bronchial asthma as a child which increases in frequency whenever she experienced what she termed '*traumatic experiences*' of repeated quarrelling between her parents leading to eventual breakdown of their marriage. Between acute attacks, she typically experiences recurrent episodes of excessive and prolonged sneezing that worsens in the dry seasons, itching of the eyes (which, at various health establishments at the time, was severally managed as an eye disease independent of the allergic condition), itchy skin surfaces, urticarial rashes on various parts of her body and other recurrent skin eruptions. In response to an alert physician's observation of several healed scars on various parts of her body, some more prominent than others, she reports an uninhibited urge/compulsion and tendency to pass her hands all over her skin surfaces trying to feel for any palpable '*skin bumps*' or simply to scratch an itching part of the body.

She acknowledges the uncontrolled urge to '*flatten*' any palpable skin lesion which sometimes results in the formation of secondary excoriations and ulcerations on the skin at locations where a skin eruption has been deliberately scratched. She however further reports skin picking is not observed to be selective in nature i.e. the picking tendency does not have any predilection for e.g. only hidden parts of the body more than those that are typically open (e.g. hands, lower third of lower limbs etc.). The patient further indicates a fairly '*controlled*' urge/compulsion to even scratch or squeeze visible skin eruptions on the faces or hands of her husband, children and other people she encounters. Whenever asked by her husband how a particular skin ulcer (healed or still fresh) was sustained, she experiences a sense of '*guilt*' which serves as sufficient motivation to stop skin picking, temporarily; sustaining the stoppage has however remained difficult and typically only lasts for a few days or sometimes, few hours. The urge to scratch parts of the body worsens when she is ovulating and experiencing premenstrual syndrome during which period, she also experiences an increased frequency of wheezing, urticarial skin lesions, itching of the skin and eyes and general bodily discomfort; this typically happens about 3 – 5 days before her menses. The compulsion to pick, however still persists outside this period. See figs. 1 – 5 below showing healed skin ulcers i.e. scars on various body parts of the patient caused by repetitive skin picking.



Fig. 1: Scars on Thighs from Picking



Fig. 2: Scars on Lower Limb from Picking



Fig. 3: Scar formation on Hand from Picking



Fig. 4: Scars on Left Leg from Picking



Fig. 5: Facial Scars from Picking

Discussion

Patients with ED largely report a part of the body with predilection for picking though they still pick other areas to allow the primary picking areas to heal.¹ The patient in this case report however on the contrary, indicated she sometimes continues to pick even already picked parts that may have ulcerated; this should be further investigated in future studies. While some individuals with ED may pick briefly multiple times a day, others may have picking sessions lasting for hours.¹ Though the use of fingers/fingernails for picking remain the most common, a significant minority may use tools such as tweezers or needles.⁴ *Skin picking on account of ED is invariably facilitated by triggering causes, common among which are feeling or examining irregularities on the skin and feeling anxious or other negative feelings.*⁶ ED complications, aside physical scarring and disfigurement, may include infection at the site of picking, physical damage to tissues and septicemia though rare.⁶ Cases of severe damage following picking may necessitate skin grafting; life threatening injuries however remain rarely documented in available studies.¹ Patients of ED may experience feelings of intense helplessness, guilt, shame and embarrassment following skin picking.¹

Many different theories have sought to explain causes of ED including *biological* and *environmental* factors.¹ Research has hypothesized that ED comprises a coping mechanism to help manage elevated levels of turmoil, arousal or stress within individuals who have impaired stress responses.^{1, 7} Some psychologists, contrary to the neurological theories, explain that the picking behavior may be attributable to repressed rage felt toward authoritarian parents; a similar theory also further holds that overbearing parents may cause development of the behavior in their children.¹ Available evidence in support of this theory further indicate that strong associations exist between ED and traumatic childhood events.¹

Evidence in support of *neurobiological* causative factors of ED remain scanty as there are no known neuroimaging studies of ED patients. Research has established linkages between cocaine and methamphetamine drug abuse (which increase the pharmacological effects of dopamine) and triggers an uncontrollable picking urge in users.¹ Evidence in support of inherited traits or genes is currently unavailable.⁸ Diagnosis of ED is typically challenged by objection to its inclusion in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5); creation of a separate category in the DSM-5 is firstly premised on the position that *ED may just be a symptom of different underlying disorders* and secondly because *ED is simply a bad habit that should not be accorded its own separate category* to avoid inclusion of a wide array of bad habits as separate syndromes e.g. nail biting and nose-picking.⁵ Stein however posits that ED qualifies as a separate syndrome that deserves its own category with the reasons that ED occurs as the

primary disorder and not as a subset of a larger disorder that has well-defined clinical features and diagnostic criteria and has a high incidence in the population.⁴ It is therefore not described in this case report as a subset of the clinical spectrum of hypersensitivity but hypersensitivity is described in the capacity of a sufficient and maybe, persistent trigger for picking.

Neurotic ED (NED) refers to skin picking whereby the patient confesses to the creation of the lesions; researchers in the field of psychiatry however employ rather rigid diagnostic criteria for NED. Patients within the psychiatric criteria are at a severe end of the clinical spectrum.⁹ Despite its classification as a psychiatric disorder, psychiatric and dermatologic factors may combine to trigger NED.⁹ *Patients with undertreated pruritic dermatoses or with insect bites, dry scaly skin, acne, keratosis pilaris and other cutaneous irregularities are at risk of picking when stressed.*⁹ Current evidence base is deemed largely biased as subjects in these studies were mainly recruited from psychiatric homes or psychology students; this further biases understanding of the clinical spectrum.⁹ *While the average age of onset is 15 – 35 years, female to male ratio of 70:25 characterizes ED and 44% of patients report an increased perimenstrual urge to pick.*⁹ Patients generally seek medical help after about 10 years due to feelings of guilt and shame.⁹

The American psychiatric association includes ED in the Obsessive Compulsive Syndrome spectrum of diseases.⁹ *NE can be triggered by some minor skin pathologies e.g. insect bite, eczema, folliculitis or acne.*⁹ This case report posits that the underlying trigger for picking for the patient mainly comprises the underlying type 1 hypersensitivity disorder (in accordance with the Coombs and Gell classification i.e. undesirable reactions produced by the normal immune system, e.g. allergies and autoimmunity).¹¹ Type one hypersensitivity reaction is characterized by immediate response to an allergen occurring in minutes, rather than multiple hours or days when free antigens cross-link the IgE on mast cells and basophils causing release of vasoactive biomolecules.¹² Such reactions notably include atopy, anaphylaxis, asthma and Churg-Strauss Syndrome.¹¹ *The patient reports an observed increase in skin picking around and during her menstrual periods i.e. increased urge to pick during menstruation and the perimenopausal period; this is consistent with research findings that indicate that about 44% of patients, largely female, generally report an increased perimenstrual urge to pick.*⁹

The increased urge to pick shortly before menses may be possibly triggered and explained by *Autoimmune Progesterone Dermatitis (APD)*; this is a rare immune response to endogenous progesterone first described in 1921, characterized by cyclic cutaneous and mucosal lesions at the end of the luteal phase when progesterone levels are elevated. The lesions typically disappear 1 - 2 days after menstruation ceases.¹³ Intradermal testing with 50 mg/mL progesterone was

however beyond the clinical capacity and expertise of the district hospital where this study was carried out. *Lesions characteristic of Autoimmune Progesterone Dermatitis (APD) may include erythema multiforme, urticaria, eczematous patches, angioedema, papulopustular/papulovesicular lesions, stomatitis, folliculitis, Stevens Johnson syndrome, vesiculobullous reactions, dermatitis herpetiformis-like rash, and mucosal lesions.*¹² Lesions may be localized or generalized and have a predilection for the face.¹²

Other health conditions that characterize type I hypersensitivity may be exacerbated just before and during a woman's menstrual period when progesterone and estrogen levels decrease.¹⁴ This complex relationship between hormones and type I hypersensitivity reactions (reported in an estimated 19 and 40 % of asthmatic women)¹⁵ may worsen bronchial asthma for some women; it is a phenomenon not yet fully understood.¹⁴ A hypothesis posits that fluctuations in hormonal status at ovulation and before periods influences asthma in women with special focus on estrogens.¹⁵ The perimenstrual sex hormone fluctuations are also considered responsible for many other perimenstrual symptoms and for specific inflammatory, autoimmune and pain related conditions e.g. headache and pelvic pain etc.¹⁵ Symptoms of atopic dermatitis, urticaria etc. therefore significantly increase around the perimenstrual period during which period skin picking may therefore be intensified.¹⁵

A hypothesis portrays ED as a coping mechanism to deal with elevated levels of turmoil, arousal or stress within the individuals who inherently have an impaired stress response while some psychologists attribute the behavior to repressed rage felt toward authoritarian or overbearing parents.¹ Ten patients, interviewed by researchers with aims to establish diagnostic criteria for ED, largely reported experiencing personal problems when picking began while four reported abuse suffered in childhood or adolescence.¹⁶ The patient in this case report identifies childhood experiences with marital problems of her parents and the experience of authoritarian parenting as traumatic exposures during her childhood. The fifth Diagnostic and Statistical Manual of Mental Disorders (DSMMD), May 2013, classifies this disorder as its own separate condition under "Obsessive Compulsive and Related Disorders" and is termed "excoriation (skin-picking) disorder"; it is however currently added, as a new category, under OCD (Code: 42.4) since the latest DSM-5 current as of 1st October 2017 by the World Health Organisation (WHO).⁴ The ICD-11, published 2018, categorises ED under Body-focused repetitive behaviour disorders which sits under Obsessive-compulsive or related disorders.⁴

Case Management and Prognosis

Exposure and Response Therapy (ERP) aimed to enable the patient appreciate the need to stop picking her skin or to stop picking to the verge of skin ulceration and

the associated complications thereof has been the preferred mode of management *i.e. patient is encouraged to 'face her fears' and let obsessive thoughts occur without neutralizing them with compulsions.*

She has further been educated on links between increased frequencies of asthma symptoms with recurrent acute asthmatic attacks and the periovulatory and perimenstrual development of skin lesions that she reported experiencing and picking; these were of particular concern to the patient prior to explanation of the link. She continues to receive routine appropriate asthma treatment with relievers and spacers. She however remains uncompliant with prescribed oral steroids as she associates them with weight increase. She reports observed improvements in *picking control* associated with an awareness to inhibit the urge to pick. The use of pharmacological agents for ED have not been preferred as the patient generally exhibits a full ability to go about her normal duties without any physical or psychological challenges.

Preferred pharmacological treatment generally otherwise may include selective serotonin reuptake inhibitors (SSRIs), opioid antagonists and glutamatergic agents.¹ Some other pharmacological products have been documented in other literature in small trials as well.¹ Antipsychotic, antianxiety, antidepressant, and antiepileptic medications have all been used to treat skin picking with varying degrees of success.¹⁸ Counselling within the scope of behavioural therapy that includes habit reversal training associated with awareness training, cognitive behavioural therapy, and acceptance and commitment therapy have been found to be effective treatment approaches.¹⁹

Prognosis of ED is characterized by its interferences with daily life though patients may take measures to further conceal this interference by not leaving home, wearing long sleeves and trousers even in heat, or by covering visible damage to skin with cosmetics and/or bandages as a result of attendant shame, embarrassment, and humiliation.¹⁹ While some available evidence on ED indicates it can last between 5-21 years if left untreated, *many doctors on the contrary consider this disorder to be a permanent diagnosis.*²⁰

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A DIAGNOSTIC DILEMMA: WAS THIS DEATH NOT A CASE OF AN INFANT WITH CYTOMEGALOVIRUS INFECTION?

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Abstract

A 3-month-old female infant was referred to a teaching hospital with a 3-day history of fever, fast breathing, cough and 19 hours of yellowish discoloration of sclera. She was deeply jaundiced and febrile, had hepatosplenomegaly, was microcephalic and thrombocytopenic. Child was worked out and treated for bacterial pneumonia, atypical pneumonia, pulmonary tuberculosis, fungal opportunist infection, and heart failure. She was oxygen dependent throughout the 2 months of admission and deteriorated despite all interventions.

Considerations for viral infection was made later into her admission but delayed farther due to financial challenges.

Immunoglobins (IgG and IgM) for Cytomegalovirus (CMV) came up positive. Child had hypoxic pneumonia of which CMV is a documented cause in this age group and could have benefitted from empiric ganciclovir cover if clinicians had thought of it.

There is the urgent need for clinicians to widen the differential list especially when response to conventional treatment is poor. Valid National Health Insurance card holders should benefit from a wider range of laboratory services if our aim to decrease infant mortality will materialize.

Key Words: *Cytomegalovirus, clinical, misdiagnosis, inappropriate, treatment*

Introduction

Cytomegalovirus (CMV) infection like other "TORCHS" infections still remain a significant cause of morbidity and mortality in sub-Saharan Africa. Both congenital and perinatal infections are significant in causing the disease in neonates¹. Generally, the seroprevalence of CMV is higher in children; with African children reported to have rates in the range of 80% to 100%¹. Prevalence studies of CMV infection shows that the infection is usually higher in developing countries². CMV IgG seroprevalence among Ghanaian HIV negative blood donors was 77.6% in Accra³, whilst Kumasi had a higher prevalence of 94.3%⁴.

CMV infection can present as severe symptomatic disease among the immunocompromised such as people with HIV, cancer patients and neonates⁵. CMV pneumonia is reported to be the most occurring acute outcome of the infection¹. Despite the importance of the disease, most diagnosis are made late with a sizeable quota of these diagnoses made at autopsy. This is the case even in developed countries¹. Diagnosing CMV can be challenging because in symptomatic disease, the presentation can be nonspecific and may involve multiple systems⁶. Diagnosis of CMV can be made by serology, however viral cultures and PCR are preferred⁵.

We present in this report the case of a 3-month old infant who was unsuccessfully managed for 2 months on various differential of pneumonia that did not include probable CMV. The diagnosis of CMV pneumonia was made prior to her demise.

Case report

A 3-month-old female infant, weighing 3.2kg, was referred to the Teaching Hospital with a 3-day history of fever, fast breathing, cough and 19 hours of jaundice.

Baby was delivered at full term following an uneventful pregnancy with a birth weight of 2.9kg. Neonatal period was unremarkable.

At age 5-weeks, the infant was managed as an inpatient for 5 days at a peripheral hospital on account of cough. Symptoms had resolved at the time of discharge from the hospital.

Infant was exclusively breastfed up to 6 weeks, at which point mother introduced water. She had received all vaccines as recommended by the Expanded Programme on Immunization for Ghana.

On admission to the ward at the Teaching Hospital, patient was deeply jaundiced and febrile (temperature 38°C). Spontaneous respiration at 80cpm (high for age), labored with intercostal and lower chest in-drawing. Oxygen saturation on intranasal O₂ was 96% from referral hospital (Patient de-saturated to between 70-80% off oxygen). Bronchial breath sounds with bilateral crackles were heard on auscultation. Heart rate 135bpm, normal heart sounds, capillary refill time <3sec. Palpable liver 5cm and spleen 1cm below the right and left costal margins respectively. Patient was microcephalic (head circumference: 36 cm (< 3RD

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centile for age and sex), gained neck control but could not roll on side or to prone position at 3 months.

Total WBC 35.05×10^3 /micro/L; Lymphocyte 59.1%; Neutrophil 31.7%; Monocytes 4.8% Platelet: 88×10^3 /micro/L; HIV test negative in both mother and child. International normalized ratio (INR) 4.0 (high) Chest X-ray was suggestive of bronchopneumonia (Figure 1)

Working diagnosis

Sepsis secondary to bronchopneumonia with multi organ dysfunction (respiratory and acute hepatic failure) in an infant failing to thrive.

Over a period of 2 months, other diagnoses and treatment were given (table 1) to no avail. Infant kept de-saturating and was on oxygen throughout admission. Temperature remission was not sustained for more than

3 days on any of the modified treatment. In the week patient died, CMV IgG and IgM serology tests came out positive.



Fig. Chest radiograph showing reticular opacities in both perihilar regions, with silhouetting of a part of the right cardiac border. Features suggestive of bronchopneumonia.

Table1 Diagnosis and treatment timelines for patients

Days into admission	Diagnosis	Treatment/Interventions
0	Sepsis/bronchopneumonia/ acute liver failure with coagulopathy	INO/ IV cefotaxime/gentamicin/IV vitamin k/ syr. lactulose
10	Pulmonary Tuberculosis	Anti-TB therapy with fixed-dose combination (HRZ and E)
16	S. aureus Sepsis Atypical pneumonia	Suspension Erythromycin 14day course
19	Cyanotic congenital heart disease	INO
32	GERD with extra-esophageal manifestation	IV/oral omeprazole for total of 21days
37	Atypical pneumonia PJP pneumonia	Bubble CPAP; Oral Cotrimoxazole for total of 21days (interrupted dosing) Oral prednisolone for 7 consecutive days
45	Fungal pneumonia	Oral fluconazole (more affordable) for 14 days
57	Congenital infection (ToRCHeS) CMV Pneumonia	1st dose IV ganciclovir given (died same day)

GERD-Gastroesophageal reflux disease; INO-Intranasal oxygen; IV-Intravenous; S Aureus-Staphylococcus aureus; CPAP-Continuous positive airway pressure

Discussion

This was a case of a 3-month old female who presented to the ward for almost two months with persistent fever, multi-organ failure and intranasal oxygen dependent unresponsive to all types of antimicrobial. This Infant from the day of admission had signs that were suggestive of CMV if it had been thought through as a differential. Microcephaly, thrombocytopenia,

hepatosplenomegaly, deranged INR, and oxygen dependence are all possible in CMV infection⁷. In a 3-month-old, distinguishing between congenital and acquired CMV could be challenging. Low birth weight infants and prematurity increases risk of breastmilk transmission⁸. This infant was born term with birthweight of 2.9 kg. CMV screening is not part of routine antenatal screening in mothers in Ghana and thus the mother’s status was unknown prior to delivery. Due

to financial reasons, mother could not be tested on admission. Aside *Staphylococcus aureus* which was microbiologically confirmed and treated based on sensitivity results, all other diagnosis was presumptive. Chest X-ray showed bilateral infiltrate but was non-specific for any disease. X-ray finding for CMV include characteristic ground glass opacity/consolidation⁹. Patient did not improve on the antibiotic based on the culture results. Being an infant, her immune system was not well developed. Moreover, the long duration of stay on the ward (2 months) and the use of broad-spectrum antibiotics further increased the risk for multiple or nosocomial infections¹⁰. CMV diagnosis can be made on urine, blood, CSF using PCR. Positive PCR on urine sample in the first 3 weeks of birth confirms congenital CMV⁵. Other tests are Immunoglobulin (IgG and IgM). In our case, both IgG and IgM were positive for infant. The IgM confirm infection in the infant but cannot confirm whether it was acquired or congenital because maternal status was unknown. CMV viral load also confirms infection and is used to determine and monitor treatment progress¹¹. Intracranial calcifications are picked by CT scan of the head¹².

Main drugs of choice for CMV are ganciclovir or valganciclovir¹³. Both drugs have side effects requiring monitoring while on treatment. Infants who survive must have hearing, visual and developmental assessment done regularly. In a child with persistent hypoxic pneumonia despite multiple interventions coupled with multi-organ-failure, disseminated CMV should have been a probable diagnosis. Starting ganciclovir empirically could have been life-saving. This case report is emphasizing the need for clinicians to review initial diagnosis when clinical response to presumed diagnosis is poor. Other differentials factoring the age, clinical progression, and epidemiology of diseases within the age bracket is relevant in evidenced-based clinical practice. It is not uncommon for an initial misdiagnosis of clinical presentation especially in an infant. Two months of admission with frequent review, combining features such as microcephaly, fever, jaundice, hepatomegaly, deranged INR, hypoxic pneumonia and poor response on mainly antibiotics, 'TORCHES' infections especially CMV should have featured on the differential list and appropriate interventions boarded.

Conclusion

This infant probably died from CMV Pneumonia which is a treatable disease. A child may present similarly at any facility and lessons from this case could prevent a mortality. The health system should be strengthened so that relevant laboratory tests and medications are available for all children especially valid National Health Insurance Scheme (NHIS) card holders.

Limitations

Financial challenges caused significant delay getting CMV test worked up. Mother could not be investigated and viral load, PCR samples, CT Scan could not be done. Hearing and visual assessment was not done because there was no clinical suspicion to indicate that. Parents refused post-mortem examination.

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HYPERTENSION/ OBESITY

Obesity and hypertension have become epidemics worldwide and Ghana has not been spared.

Hypertension occurs about five times more frequently in the obese than in the non-obese. Diabetes Mellitus (Type 2) is more common in the obese than in the non-obese. Often the control of the body weight in the obese does control the hypertension and diabetes.

Therefore, if obesity is prevented, much of the diabetes and the hypertension are also prevented.

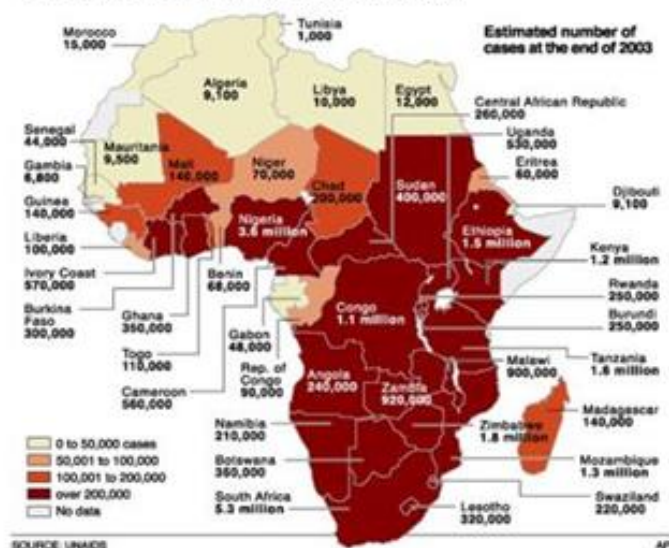
Obesity also causes arthritis in the middle and older age groups. Control of body weight is therefore helpful in preventing arthritis also.

In Ghana, the acquisition of foreign (western) dietary habits makes a large contribution to obesity, hypertension and diabetes in the country.

HIV/AIDS

AIDS in Africa

Of the estimated 39.4 million people living with HIV worldwide, more than two-thirds of them are in Africa.



An AIDS patient



Human immunodeficiency virus (HIV) is a lentivirus (a member of the retrovirus family) that can lead to acquired immunodeficiency syndrome (AIDS), a condition in humans in which the immune system begins to fail, leading to life-threatening opportunistic infections.

Ghana's first case of AIDS was reported in 1986. The early epidemic in Ghana developed primarily as a result of the economic crisis of the 1980s and the vulnerabilities of migrants who fled to neighboring countries in search of economic opportunities, some of whom resorted to sex work or relied on sexual partners in order to survive.

Infection with HIV occurs by the transfer of blood, semen, vaginal fluid, pre-ejaculate, or breast milk. The four major routes of transmission are:

- 1) Through unprotected sex (i.e. without a condom) with an infected person
- 2) Sharing of contaminating sharp, skin-piercing objects (e.g., razor blades or needles)
- 3) Through contaminated blood or blood products (e.g., blood transfusion)
- 4) From an infected mother to baby through pregnancy, labor and delivery, or breast-feeding.

HIV is NOT spread through casual contact, such as sharing a meal together, talking with someone, or using the same washroom.

The government of Ghana responded quickly to the threat of HIV/AIDS with the establishment in 1985 of a National Technical Advisory Commission on AIDS and in 1987 with the National AIDS/STD Control Program. Although the epidemic is much worse in East and Southern African countries, Ghana today nonetheless has a generalized epidemic with a national prevalence of 1.9%. A generalized epidemic is a country with a prevalence higher than 1%, which means that the epidemic is not primarily confined to people who have risky behaviors, such as sex workers or people with multiple sex partners. In a generalized epidemic, people with only one sex partner are at risk of contracting HIV.

Antiretroviral therapy (ART) enables people infected with HIV to regain their strength and live normal lives,

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2. All authors have read and approved the final draft.
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McLendon WW. A historical perspective as a compass for the future of Pathology. Arch Pathol Lab Med 1986; 110: 284-288.

Book

Talbot CH. Medicine in Medieval England. Oldbourne, London. 1926 p 120-136.

Book Chapter

Phillips SJ, Whisnau JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors, Hypertension: pathophysiology, diagnosis and management. 2nd Ed. New York: Raven Press, 1995, p465-478.

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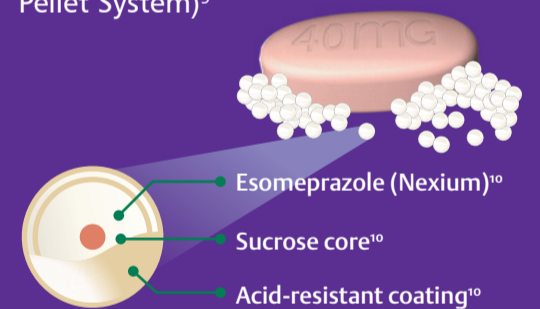
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