ORIGINAL ARTICLES

POLICIES FOR IMPROVING ACCESS TO AND QUALITY OF ESSENTIAL BASIC SURGICAL CARE AT DISTRICT HOSPITALS IN GHANA

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Abstract

Background: Ghana Health Service has, as one of its major functions, the provision of accessible healthcare to the rural population with regards to surgical and other medical problems requiring hospital care.

Methods: Data was obtained from ten district hospitals through interviews with health personnel, from theatre records and by the completion of a questionnaire before the visit of research team members, who then interviewed the person who completed the questionnaire.

Results: None of the physicians working in these facilities had any formal surgical training beyond that obtained in medical school and during a six-month rotation each in surgery and obstetrics and gynaecology. They performed various emergency and elective surgical procedures such as caesarean sections, laparotomies for typhoid ileal perforation, herniorrhaphies, excision of lumps, among others.

Outcome measures: Interim measures to expand the quantity and quality of emergency and essential surgical care at district hospitals include compulsory short-term surgical training for medical officers prior to assuming their responsibilities, making available opportunities for continuing short-term surgical education and additional surgical training for medical officers currently working in district hospitals, provision of financial and non-financial incentives to physicians with surgical training or surgical experience to entice them to occupy positions in such facilities and training of diplomates and non-physician clinicians to perform the most common emergency and essential surgical procedures.

Conclusion: In the absence of surgical specialists in the District Hospitals, measures are needed to expand access to proper emergency and essential surgical service for the over 60% of the rural population.

Keywords: District hospitals, surgical care, rural population, anaesthesia.

Introduction

Ghana's Health Service has the District Health System as the backbone of its health care delivery. Managing District Health facilities effectively is essential for the implementation of the Health Policy, especially if it is to benefit the rural population, which forms over 60% of Ghana's population[1] and which also finds it difficult to access the few regional and tertiary facilities in the country.

In Ghana, adequate surgical services are provided mainly in the tertiary health centres in urban areas. There is a concentration of doctors, especially surgical specialists, in these places while there is a shortage of the same in the district hospitals; in fact, surgical specialists are non-existent in the rural areas of Ghana.

In almost all the district hospitals in the rural areas, where the overwhelming majority of the population lives, surgical services are provided by non-specialist medical officers - many of who are most often without formal surgical training, a finding consistent with that in most district hospitals in sub-Saharan Africa. [2,3] There are marked limitations in the numbers and training of surgical personnel in district hospitals of Ghana, but the physical infrastructure and the supply of surgical and anaesthesia equipment are reasonably good for a developing country[4].

The World Health Organization (WHO) has emphasized the fact that the unavailability of proper surgical care for most of the population is a neglected health issue in developing countries, which includes Ghana, since surgery is perceived as too expensive and too sophisticated for most government budgets to fully support.[5] However, recent studies by McCord *et al*. in Bangladesh[6] and Gosselin *et al*. in Sierra Leone[7] have questioned whether the perception that surgery is too expensive and sophisticated is accurate.

The lack of proper surgical care for most of the population of the world is often due to inadequate basic equipment, poor infrastructure and insufficient numbers of health personnel and training facilities. All the same, it is recognized that through the use of simple surgical interventions it is possible to prevent permanent disabilities and death from conditions resulting

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from infections, congenital conditions, road traffic accidents, falls, burns, pregnancy-related complications, hernias and other readily curable surgical problems.[3] There is growing evidence to show that emergency and essential surgical services can be cost-effective from the public health standpoint in low and middle income countries.[7-9] Surgical conditions contribute significantly to the disease burden in sub-Saharan Africa, especially in the rural settings.[8-10] With the knowledge that lack of surgical care is a public health crisis in developing countries,[11] we set out to evaluate the preparedness of district hospitals in Ghana to offer surgical services to the rural population of the country and to make recommendations on improving basic, essential and quality surgical care in these facilities.

Methods

A survey of ten District Hospitals, one each from the ten administrative regions of Ghana, was carried out in the month of August 2009. A district hospital was randomly selected in each region and visited by the study team for the data collection. The study sites had similar health service delivery systems, with primary health care clinics being the first referral level, followed by higher level of care such as the health centres and then District hospitals. Referrals from District hospitals go either to one of the 10 regional hospitals or directly to one of the three tertiary hospitals (i. e. Korle-Bu, Komfo Anokye and Tamale Teaching Hospitals) in the country.

Data were obtained from interviews with the health personnel in these hospitals (medical doctors, administrators, directors of nursing services, all who perform major and/or minor surgical procedures, and persons who provide anaesthesia services). Data were also obtained from the operating room logbook. In each hospital, a questionnaire (Appendix A) was completed ahead of the visit of the study team, and then the study team also interviewed the person who completed the questionnaire. The data was entered into an Excel sheet and simple calculations such as total number of hospital beds, operations and personnel working in the hospital performed.

Results

The population of the catchment area of these 10 district hospitals ranged from 45,245 to 177,743 people (Table 1). The number of doctors in the hospitals ranged from a minimum of one to a maximum of 3, with a medical officer per 100,000 population being in the range of 1.1 to 2.1. In all there were 17 doctors (medical officers) in the 10 district hospitals. Other health providers in these hospitals are listed in Table 2. All the hospitals employed the services of nurse anaesthetists; none had anaesthesiologists in their employ. The number of beds per 10,000 population in the 10 investigated district hospitals ranged from 2.5 to 19.9.

Of the 17 medical officers, 14 were available for interview. None had any formal training in general surgery, orthopaedic surgery, obstetrics and gynaecology or paediatric surgery except for one who claimed to have completed one year surgical residency training.

Table 1: District Hospital, Bed Status, Catchment Population, Medical Officers and Surgical Procedures at 10 District Hospitals investigated in Ghana.

District Hospital	Region	Population served by hospital	No. of beds*	Hospital beds per 10,000 population	No. of doctors per hospital	Doctors per 100,000 population	Total No. major and minor procedures in 2008	Total No. caesarean sections in 2008
Dodowa	Greater Accra	142,000	21-25	2.5	3	2.1	701	0
Hohoe	Volta	177,743	101-200	8.4	2	1.1	2092	208
Winneba	Central	142,663	201-300	17.5	3	2.1	967	342
Bibiani	Western	137,167	81-100	6.6	2	1.5	330	92
Begoro	Eastern	95,000	51-80	6.8	1	1.1	392	114
Bekwai	Ashanti	45,245	81-100	19.9	1	2.2	1080	208
Goaso	Brong Ahafo	120,275	81-100	7.5	2	1.7	269	30
Bole	Northern	68,735	21-50	5.1	1	1.5	607	36
Tumu	Upper West	90,500	51-80	7.2	1	1.1	742	55
Sandema	Upper East	83,174	101-200	10.8	1	1.2	584	55
Total		1,065,454	960**	9.0	17	1.6	7764	1135

*Range of beds given and not the exact number of beds in each district hospital.

** The total number of beds (960) is the sum of the midpoints of the range of beds in each of the 10 district hospitals visited.

Table 2: Surgical and anaesthesia care providers at the 10 surveyed District Hospitals in Ghana

Type of surgical provider	Total No. providers for 10 hospitals combined	Average No. providers per hospital	Percentage of total surgical providers
Specialist surgeon/ anaesthesiologist	0	0.0	0.0
Medical officers	17	1.7	8.5%
Midwives	102	10.2	50.7
Nurse anaesthetists	12	1.2	6.0
Theatre nurses	61	6.1	30.3
Ward assistants	9	0.9	4.5
Total	201	20.1	100.0

Table 3: Major Surgical Procedures performed at the 10 District Hospitals in Ghana under investigation.

Procedure	Percentage of major surgical procedures performed
Caesarean section	46.7
Inguinal herniorrhaphy	24.4
Evacuation of retained products of conception from the uterus	11.1
Abdominal hysterectomy	4.1
Salpingectomy (e.g. for ectopic pregnancy)	2.7
Hand surgery	2.4
Arthrotomy	2.4
Laparotomy for other abdominal conditions (e.g. typhoid perforation)	2.0
Amputations	1.3
Open reduction and internal fixation (ORIF) of fractures	1.2
Other uterine procedures (e.g. myomectomy, repair of uterine lacerations)	1.0
Appendectomy	0.7
Total	100.0

Table 4: Minor surgical procedures performed at 10 District Hospitals in Ghana

Procedure	Percentage of minor surgical procedures performed
Suturing of wounds (including episiotomies)	61.8
Excisions of masses, lumps and bumps	12.9
Other minor procedures (e.g. removal of foreign bodies)	8.8
Incision and drainage of abscesses	7.9
Wound management (e.g. debridement, dressing, etc)	4.1
Other minor gynaecological procedures (manual placenta removal, Norplant removal)	1.9
Cervical cerclage	1.2
Casting of fractures	1.2
Total	100.0

Over 50% of these doctors indicated some informal training in surgery – i.e. observing other surgical specialists perform surgery or performing surgery with a specialist as an assistant or even reading from textbooks and other surgical literature before undertaking various surgical procedures.

Of the 10 District hospitals, only 3 were able to provide surgical procedures 24 hours a day, 7 days a week. The inability to perform surgical operations at times was attributed to the unavailability of the medical officer especially in one-man stations, the absence of the nurse anaesthetist or other logistical problems.

The total number of major and minor operations performed in all the 10 District hospitals visited was 7764 in 2008 (Table 1). The most common surgical procedure performed was caesarean section (46.7%), followed by inguinal herniorrhaphy (24.4%) and evacuation of retained products of conception (11.1%) (Table 3). The most common minor procedure was suturing of wounds (61.8%), followed by excision of masses, lumps and bumps (12.8%) (Table 4).

None of the hospitals had a designated area for preoperative emergency resuscitation of surgical patients though half the hospitals investigated had an area designated for postoperative care. In general, all the hospitals investigated were relatively well-equipped with basic laboratory services, running water and electricity supply for at least some of the time. Except for two

hospitals, the rest had a blood bank capability at least some of the time. We did not ascertain the morbidity and mortality rates after the various surgical procedures performed by these medical officers for lack of available documentation to that effect.

Discussion

According to a WHO country assessment, emergency and essential surgery is beginning to be seen as an integral part of essential health services and a cost-effective way of dealing with many health challenges specific to low-resource settings.[10] Examples of surgical procedures which WHO considers to be part of essential health services include drainage of abscesses, casting techniques to treat fractures and clubfoot, removal of dead or damaged tissue, caesarean section for complications of labour, and laparotomy for the management of acute intra-abdominal surgical conditions.[8]
In most low-resource settings where the vast majority of the population of developing countries lives, access to treatment for various surgical conditions is limited because of the unavailability of adequately trained surgical and anaesthesia personnel in the district hospitals[12] and a lack of proper surgical and anaesthesia equipment and supplies.[11] Ghana appears to be relatively unique among many developing countries in that the district hospitals are relatively well equipped with supplies and equipment and the number of supporting staff appear to be adequate as well[4]. Ghana is however lacking in trained personnel to perform these basic surgeries.

We found that all the medical officers reported that they were overworked, and the hospitals included in our study lacked specialist surgical teams of all kinds, such as general surgeons, orthopaedic surgeons, paediatric surgeons, urologists, obstetricians and gynaecologists, anaesthesiologists, etc. As a result, the available medical officers and nursing and paramedical workers in these hospitals were required to perform a wide range of surgical procedures, often with inadequate training and experience. None of the medical officers in the 10 hospitals had any adequate formal surgical training. Over 63% of the procedures carried out in these institutions were for emergencies (caesarean sections, evacuation of retained products of conception, salpingectomy for ectopic pregnancy, and laparotomy for acute surgical conditions such as typhoid ileal perforation and appendicitis), which all require some expertise.
It is unlikely that district hospitals in Ghana will be fully staffed with surgical specialists and anaesthesiologists in the near future (5-15 years from now) since the current training programmes in place are not matching the demand. And for this reason some rapid and pragmatic measures are needed to alleviate the increasing surgical workload in the rural areas of the country. Such measures should include: specialist outreach programmes; continuing professional development; surgical mentoring of young doctors by more experienced specialists; training of middle level health providers (e. g. non-physician clinicians or physician assistants) as has been successfully carried out in countries such as Mozambique[13,14], Tanzania[14], Uganda[14], Malawi[15] and Zaire[16]; surgical camps involving visiting surgical teams from the high-income countries as practiced elsewhere or even from urban Ghana; and decentralization of surgical services.[17-22]

There are recognisable ”push and pull” factors at play which will determine whether the staffing of surgical and anaesthesia personnel in rural district hospitals will improve or whether the net flow of such personnel will produce an ”internal brain drain” into the private sector in urban areas.

We believe implementing the following measures by the Ghana Government and development partners will improve basic, essential and quality surgical care at district hospitals in the rural areas of Ghana and enhance health care delivery:
1) Assurance of a basic level of surgical infrastructure (functioning and equipped operating theatre, running water and electricity, supplies) and technology to support safe emergency and essential surgery and anaesthesia;
2) Earlier exposure of medical students (from the first year) to community-based and hands-on clinical clerkship experience to eventually increase their interest and to increase the number of graduates willing to serve in the rural areas after graduating from medical school;[2,8]
3) Compulsory basic surgical skills training of 6-12 months at a regional or tertiary hospital for all medical officers prior to assuming responsibility for surgical services at district hospitals;
4) Expansion of the number of providers of surgical services by requiring residents in formal surgical training programmes in Ghana to spend one year at a district hospital upon completion of the initial phase of their residency training (this, we believe has taken off with products of the Ghana College of Physicians and Surgeons);
5) Training of non-physician clinicians (NPCs), such as physician assistants, to perform specific and limited surgical procedures in the district hospitals.[9,23] A special programme should be developed for training and supervising NPCs. The training would enable them to provide basic surgical care in the rural areas, particularly for the most common procedures such as dilatation and curettage, caesarean section, hernia repair, suturing of wounds, manipulation and immobilization of fractures, and incision and drainage of abscesses. Other more complicated procedures would still be managed by the surgically trained medical officers or be referred to surgical specialists in the regional or tertiary facilities. According to Wilhelm *et al.*[24] non-clinician physicians when adequately trained and supervised, can safely perform major general surgical procedures. Such NPCs would be drawn from the local area[25] and would

understand the local customs and language and would therefore be more likely to remain at that facility for a long time;

6) Additional financial and non-financial incentives for physicians with additional surgical training and/or experience beyond that normally received by medical officers to encourage their application for posts at district hospitals and their long stay in such positions.

7) Elimination of "one-man stations" at which one medical officer is the only physician providing medical care at a district hospital. This retards the progress of the hospital since such a doctor will also be burdened with administrative and other clinical responsibilities. Trained NPCs, especially physician assistants, will be invaluable here when the medical doctor is occupied elsewhere;

8) A special programme for providing additional short-term (six months or more) surgical training to medical officers who have been working as such and who are willing to make a long-term commitment to continuing their careers as medical officers in rural district hospitals;

9) Provision of a two- or five-year surgical residency training (including rotations in obstetrics and gynaecology) for experienced medical officers in district hospitals to qualify them with a diploma in surgery for the 2-year residency training or as rural surgeons, for the 5-year training programme[26];

10) Expansion of training of medical and paramedical personnel in anaesthesia;

11) Development of a mentoring system led by senior surgical specialists who are still in active service or on retirement to periodically visit each district hospital to help with training, consultations, and to assist with surgical procedures and provide any other needed support;

12) Provision of opportunities for medical officers in district hospitals to attend relevant continuing medical education or professional development programmes to improve their knowledge and skills of the surgical procedures they carry out in their hospitals;

13) Surgical "camps" at which specialists perform common relatively simple elective surgical procedures such as herniorrhaphies, tubal ligations, and cataract extractions should be held in the district hospitals and possibly at non-hospital sites (such as health centres) to increase access to basic elective surgical care.[17]

The proposals that we have put forth here are designed to "push" some additional surgical resources from urban to rural areas and to increase the training of qualified personnel already residing in rural areas who have the capability of becoming surgical providers with proper training and supervision.

The limitations of the study include the fact that the 10 district hospitals included in the survey do not constitute an adequate random sample of the 124 district hospitals in Ghana. Even though we feel confident that the hospitals studied are reasonably representative of district hospitals in Ghana since they were randomly selected from each of Ghana's 10 administrative regions and were considered to be a typical district hospital for that region, we cannot claim with certainty that our findings are nationally representative. A further limitation of the study is that we were not able to objectively and directly assess the quality of surgical care by measuring morbidity and mortality rates for specific procedures as a result of the lack of available documentation in the institutions to that effect. We completely agree with the suggestion by Damien *et al.*[27] to the effect that staff must be motivated to appreciate the value of proper record keeping, which may ultimately become an indispensible tool for generating the evidence needed to back advocacy for improved infrastructure and services.

Conclusion

In conclusion, our investigation shows that there are many surgical, anaesthesia and obstetrical procedures being carried out in the district hospitals of Ghana by medical officers and other paramedical personnel who have not had proper surgical training. It is our belief that if appropriately trained medical officers in surgery and anaesthesia or, preferably, fully trained surgeons (which is unlikely) were sent to these hospitals, then basic emergency and essential surgical care in district hospitals will improve, resulting in an improvement in the lives of the rural population. In the interim, training of non-physician health professional with expertise in basic surgical skills can only be an added advantage.

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