

## FROM THE PAST

### HISTORY OF ANAESTHESIA IN GHANA (3): ANAESTHETIC TECHNIQUES, CARE OF THE CRITICALLY ILL, EXTENSION OF ANAESTHETIC SERVICES AND INTERNATIONAL COLABORATION

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#### Summary

This is the third instalment in the series on **HISTORY OF ANAESTHESIA IN GHANA**. The first instalment was on **Human Resource Development in Anaesthesia**. The second was on **Development of Equipment, Consumables and Anaesthetic Drugs**.

The history of medicine in Ghana has been documented but there has not been any documentation of the history of anaesthesia in the country. Anaesthesia in Ghana has seen a number of changes in the last fifty to sixty years. These changes have been seen especially in the areas of anaesthetic drugs, anaesthetic techniques, the training of anaesthetic

manpower and introduction of intensive care facilities. There has been an introduction of new and modern anaesthetic machines and monitors which were completely absent some decades ago.

This article seeks to highlight some of the major changes that have taken place in the specialty. The challenges facing the specialty in terms of the supply of consumables, the lack of maintenance of equipment and the low numbers of enrolment into the specialty by physicians are discussed. The role of international collaborations and the setting up of new specialised units like the National Cardio-thoracic Centre are also mentioned in this article.

*Key Words: Anaesthetic techniques, Obstetric anaesthesia, Intensive care, Patient Controlled Analgesia.*

#### Anaesthetic techniques

##### *Non-obstetric patients*

Anaesthetic techniques have seen a lot of changes with the introduction of newer agents as indicated above. Maintenance of anaesthesia which was previously done using diethyl ether has given way to a relaxant technique with opioids. In the past, no opioids were given intra-operatively. The use of suppositories and wound infiltration with local anaesthetic agents such as bupivacaine is now routinely done.

#### Obstetric patients

##### *Obstetrics anaesthesia*

There have been a lot of changes in obstetric anaesthesia. Caesarean section which was done with diethyl ether under spontaneous respiration was changed to controlled ventilation using a relaxant technique in the mid-1980s. Intra-operative opioids are given after the delivery of the baby. There has been

also a shift from general anaesthesia to spinal anaesthesia. The Spinal anaesthesia rate which was about 1% in 1999 at KBTH is currently around 80%. Spinal anaesthesia is used for all obstetric patients throughout the country unless there is a contraindication. Nurse anaesthetists are doing these blocks for obstetrics cases.

One of the disturbing complications of spinal anaesthesia in obstetric patients is Post Dural Puncture Headache (PDPH). This is a well known complication of spinal anaesthesia but it is more prevalent in obstetric patients because they are young. The incidence has been variably reported to between 0.1-36%<sup>1</sup>. The exact cause of this headache is not known but a number of theories have been proposed. One of them is the continuing loss of cerebrospinal fluid after the procedure. As far back as 1914, Babcock described a spinal needle with a finer cannula to limit the incidence of PDPH<sup>2</sup>. In the 1960s and 1970s, spinal needles were made of metal and were autoclaved and reused. Later on spinal needles with a plastic introducer became available but they were also autoclaved and reused. Single use spinal needles were introduced in the mid 1990s.

At the beginning, G20 and G22 spinal needles were used. With the above theory in mind, smaller gauges, G25, G27 and G29 are now available. Gauge 25 is available in most hospitals in the country and G27

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is available in the Teaching Hospitals. The smaller gauges are more difficult to use and they usually require an introducer.

The bevel tip of the spinal needles was also blamed for the high incidence of PDPH. Whitacre was the first to develop a pencil-point needle. This was followed by Sprotte needles which tried to solve the problems of slow cerebrospinal fluid flow, difficulty in aspiration and resistance to the injection of the local anaesthetic solution. Even though the pencil-point spinal needles are better than the bevel tip, most hospitals in the country use the latter because of cost.

### ***Obstetric analgesia***

Obstetric analgesia was not started until the reign of Queen Victoria of England<sup>3</sup>. This is because of the “curse” God placed on the woman in the Garden of Eden as recorded in the book of Genesis. Pain relief in labour has undergone a number of changes in the developed countries. These include the use of regional analgesia such as epidural and patient controlled devices. In Ghana pain relief in labour has remained unchanged. Parturients still receive intermittent injections of pethidine and in some instances nothing at all for fear of neonatal depression. Epidural analgesia for labour started in the 1970s. However up to now the two oldest Teaching Hospitals in Ghana, KBTH and KATH use it on selected parturients only. This is mainly due to the lack adequate manpower in these health facilities.

### **Regional anaesthesia and nerve blocks**

Regional anaesthesia, especially spinal, is increasingly being used for surgery. Patients coming for gynaecological, orthopaedic and lower limb surgery are being given spinal anaesthesia and other forms of nerve blocks. The increasing use of spinal anaesthesia has led to a situation where practitioners, especially the newly qualified nurse anaesthetists, are losing the skills of endotracheal intubation.

Nerve blocks are increasingly being used by physician anaesthetists in the Teaching Hospitals as the sole anaesthetic or in combination with general anaesthesia for surgery. The recent availability of portable ultrasound machines has enabled more blocks to be done with confidence. Single and multiple nerve blocks where appropriate are being done. Nerve blocks include femoral, sciatic and three-in-one nerve blocks. Some of the nurse anaesthetists are able to do spinal anaesthesia but not the various nerve blocks. Epidural analgesia and anaesthesia are still not widely practiced in the country. Prof Oduro used to do epidural anaesthesia at KBTH. The needles were metal ones and they were reused after autoclaving. Doctors who do epidural anaesthesia have to do the top-ups, reload the syringes and monitor the patients themselves. With their already heavy workload, doctors are not keen to add to it.

### **Complications of central neuraxial blockage**

Even though central neuraxial blockade and other nerve blocks provide excellent anaesthesia and analgesia, they are not without complications. The Royal College of Anaesthetists of England has published its third audit report on the major complications of central neuraxial block<sup>4</sup>. The situation is not the same in Ghana. Postoperative follow up of patients in the Ghana is poorly done and as such no such data is available even though spinal anaesthesia is widely practised.

### **Challenges**

The availability of local anaesthetic agents and other consumables are erratic and this causes frustration to practitioners who want to do some of these new techniques for their patients. The introduction of spinal anaesthesia for caesarean section was met with “opposition” from both the obstetricians and the midwives at least in KBTH. One of the reasons was that it took a relatively longer time to do a spinal compared to general anaesthesia. The midwives argued that the “paralysis” of the legs of these “heavy” patients was making it difficult to clean them and transfer them to the bed after the caesarean section. These objections soon gave way to advocacy by those same personnel as the benefits of the spinal anaesthesia became evident: fully conscious patients after the surgery, less postoperative nausea and vomiting and less depressed babies on delivery, early bonding between the mother and baby. Another benefit is the lower cost of spinal anaesthesia compared to general anaesthesia.

### **Postoperative analgesics**

Traditionally postoperative analgesia has been achieved using intermittent intramuscular injection of opioids such as pethidine. This method does not give satisfactory analgesia especially after major surgery. With the increasing number of patients compared to nurses, it is obvious a number of patients experience long periods of pain as the only nurse on duty may be too busy to attend to them as quickly as possible. The supply of pethidine and morphine in the hospitals is far from satisfactory. Most health facilities have to buy these drugs from their Central Medical Stores and not directly from the company. This situation has its own inherent problem in the supply of these drugs to the health facilities.

New methods of postoperative analgesia including a continuous infusion of opioids using syringe pumps and regional analgesia like epidural, give better postoperative analgesia. These methods are however

not available to a large number of the patients. Wound infiltration with local anaesthetic agents such as bupivacaine or lidocaine is widely practiced. Similarly the use of paracetamol or NSAIDs suppositories like diclofenac is being practiced throughout the country. Some hospitals use the suppositories as the only form of postoperative analgesia after most operations. These hospitals are more concerned about safety issues more than good postoperative analgesia for their patients.

### **Patient controlled analgesia**

Patient Controlled Analgesia devices are used in the management of postoperative pain in the developed countries. The device enables the patient to deliver a predetermined dose of opioids intravenously on the press of a "button" for the relief of pain. These devices have proven to be useful for the management of postoperative pain not only in adults but in children as well. Unfortunately, the devices are not available in the country not even in the three Teaching Hospitals. The cost of the device I believe is one of the main reasons.

### **Barriers to good postoperative analgesia**

Even though studies have proven the benefits of good postoperative pain management, postoperative pain management is poorly done in all health facilities. Barriers include the belief that pain is a "necessary evil" associated with surgery. There are instances where nurses tell patients about the harmful effects of the drugs rather than the benefits. The most frequently cited problem is addiction to the drugs especially opioids even though there are no studies to substantiate this claim.

### **Care of the critically ill**

One of the most important developments in anaesthesia in this country is the care of patients who are very ill and who a decade or two ago would have been declared unfit for anaesthesia and surgery. With the increasing knowledge in resuscitation of patients, the availability of drugs such as dopamine and adrenaline, anaesthetists have been involved in the preoperative resuscitation and the postoperative management of these patients. Central venous catheterization of subclavian and internal jugular veins has helped in the fluid resuscitation of some of these sick patients.

This has come about because of increased knowledge of the pathophysiology of diseases and resuscitation methods, increased ancillary support like laboratory investigations, imaging techniques including computerized tomography scan and ultrasonography. Previously, even patients with typhoid perforation would be anaesthetised without basic investigations such as haemoglobin and sickling let alone serum electrolytes and creatinine. These investigations are now routinely done on all emergency patients before anaesthesia and surgery at least in KBTH. The opening of private medical laboratories have contributed to this

improvement at least in the urban areas, Newer and safer anaesthetic agents, new techniques including regional anaesthesia and nerve blocks have all contributed to the improved outcome of these patients.

### **Intensive Care Units**

Until recently, the very ill patients were nursed in the recovery wards (where available) or in the ordinary wards. The recovery wards are used as High Dependency Units. Intensive Care Units have now been established in a number of hospitals: 37 Military Hospital, KBTH, KATH and Tamale Teaching Hospitals. The Intensive care Unit at the 37 Military Hospital started 12 years ago. It has 6 beds each for the ICU, HDU and burns unit. The unit in KBTH started in January 2010 with 4 beds; KATH started in 2009 with 8 beds; Tamale Teaching Hospital started in August 2009 with 4 beds at the old site. It is currently using the new site which has 16 beds, 4 of which are being used for ICU patients and the remaining 12 for neurosurgical patients.

The National Cardiothoracic Centre of KBTH has had its own ICU since its inception. It has been used as a training Centre for both residents and critical care nurses from Ghana and other countries like Nigeria. Because the Centre is financially autonomous, it does not experience most of the problems facing the general ICUs. The Centre has its own fully equipped laboratory supporting its patient care. The laboratory is open to the non-cardiac patients and the general public.

### **Challenges in the running of Intensive Care Units**

All the units have similar challenges. The cost of the management of patients in the units per day is between GHC120.00 to GHC1000.00 for a ventilated patient. This amount is beyond the reach of most Ghanaians. The other challenges include lack of personnel especially nurses and in some cases physicians anaesthetists, the absence of essential equipment such as arterial blood gas and electrolyte machines and the shortages of essential consumables such as sensors for machines and transducers.

### **Extension of anaesthetic services**

Korle Bu Teaching Hospital over the last two decades has had additional specialist surgical units established. These are the National Cardiothoracic Centre (NCTU) and the Reconstructive Plastic Surgery and Burns Centre. The National Cardiothoracic Centre started on the first floor surgical theatres in 1989 with Dr Frempong-Boateng as the only surgeon. Only thoracic operations were done during that period. The dedicated theatres were opened on the ground floor surgical unit in 1992. The Centre moved to its present building about 6 years ago. The first two anaesthetists were from Germany.

Dr. E. Aniteye a Ghanaian, joined the unit in 1997, followed by Dr. D. Kotei in 1999. The unit has been manned by these two doctors since 1999 when the last

German anaesthetist left the country. Dr M N K Nelson did some sessions at the unit at the beginning. Dr H Baddoo does weekly sessions. Dr E Oforu-Appiah joined the Centre about two and half years ago. Six Ghanaian, ten Nigerian and one Ethiopian surgeons have been trained at the Centre. Residents from our department do a one-month rotation before their part I WACS examination and 4 months before the part II examination. In addition residents from KATH and Nigeria do rotations in the unit. A few consultant anaesthetists mainly from Nigeria have done some training at the unit. The Centre also offers clinical training for nurses doing the Critical Care Nursing programme of the Ministry of Health. Nurses from the sub-region such as Sierra Leone and Nigeria have also been trained at the Centre

### **The reconstructive plastic surgery and burns centre**

This unit started at the Children's Block Theatre in KBTH with a visiting Plastic Surgeon, Mr Chris Bainbridge in January 1992. The department provided anaesthesia services at the beginning. Later on there were a number of visiting anaesthetists from the UK to the unit. The permanent building was commissioned in 1995. Dr M N K Nelson was in charge of the unit until she left for the Pacific in 2001. The unit continues to receive visiting anaesthetists notable among them is Dr Nick Scott from Glasgow.

### **International collaboration**

International collaboration started during the time of late Prof Oduro when he was the head of department. The department received visitors mainly from the UK. Links were formed with some department in the UK such as the University of Leeds after Prof Oduro visited the University of Leeds and other UK departments in 1970s.

#### ***Basic Life Support Workshop***

One notable link between our department and the USA was with the University of Iowa. This led to the visit to the department by one American physician anaesthetist, Dr Margaret S Emmons and a critical care nurse to help run the first ever workshop in Basic Life Support in 1983 at the KBTH. This was made possible through Dr Jack Moyers a friend of Prof Oduro who was the chairman of the Department of Anaesthesia of the University of Iowa from 1967 to 1977<sup>5</sup>. Dr Emmons died on 16th January 2010<sup>6</sup>.

This workshop trained a number of facilitators in the department who then continued with the training after the departure of the Americans. Two members of each department in KBTH were trained in Basic Life Support. Unfortunately, this laudable initiative could not be sustained as it was originally intended to.

#### ***Foundation for Complex Orthopaedic Surgery***

This foundation, a Non-Governmental Organization, started its activities in 1999 doing a few cases over a 2 to 3 day period. This has grown over the years to the present level of two-week operations twice a year. Our department has been the main provider of anaesthetic services. The collaboration with organization has exposed our department to new monitoring techniques like "evoked potentials" The management of these major cases has added to the acquisition of knowledge and skills by residents in the department. Patients operated upon come from Ghana and other countries such as Sierra Leone, Ethiopia and Nigeria. The Foundation has now built its own hospital in Ghana.

#### ***World Federation of Societies of Anesthesiologists and American Society of Anesthesiologists***

The collaboration with these two organizations has already been written about.

#### ***Cuban Medical Brigade***

The initial membership of the Brigade, which was 17 in 1982, rose to 54 in May 1994, 62 in 1999, 138 in 2000<sup>7</sup>. There were anaesthetist among the doctors who came from Cuba who worked in various hospitals including KBTH and the Central Regional Hospital in Cape Coast. There is currently one ICU physician from Cuba at the Central Regional Hospital.

#### ***Other collaborators***

A number of hospitals in the country have collaboration from other institutions. The Department of Anaesthesia of the University of Utah, USA has been associated with the nurse anaesthetist training school in Kumasi for over 10 years. The team is led by Dr Jeff Peters. The team also helps to run the annual update course for the nurse anaesthetists in Kumasi. The number of participants at this refresher course is usually over 200. Other teams come from the Duke and Wakeforest Universities, from North Carolina, USA. The teams visit the Ridge Hospital and the Tamale Teaching Hospital at least once a year to help in the training programmes and to contribute to patient care.

### **The anaesthetic clinic**

This was started in June 2000 in KBTH. It was initially run in the afternoons. Because of the increased numbers of patients over the years the clinic was done every day Monday to Friday. The clinic had seen about 35,000 patients as at October 2007. The shortage of manpower has led to the clinic being run on Mondays, Wednesdays and Fridays since 2011. Tuesdays and Thursdays are used for booking of patents. After the initial resistance, surgical colleagues have come to appreciate the positive contribution of the clinic to patient care. The improvement in patient care, the reduction in unnecessary cancellation of elective

patients and shorter hospital stay before elective surgery are some of the benefits from the clinic. The clinic is a regular source of income for the KBTH. Other hospitals in the country such as KATH and the Central Regional Hospital have also started similar clinics.

### Research and publications

Research and publications in local and international journals have been going on from the inception of the department particularly in KBTH and KATH. Research in anaesthetic management of sickle cell patients in KBTH received international recognition. Similarly the department in KBTH pioneered the use of heminevrin for the management of eclampsia. Heminevrin is no longer used in the management of eclamptic patents. Magnesium sulphate is now being used for such patients. Research and publications are still being carried out by anaesthetist especially those in the teaching hospitals.

### Mission and private hospitals

These hospitals have played a very important role in the delivery of health care in Ghana especially in the rural areas. Various types of surgery are done in these hospitals. The shortage of anaesthetic manpower including Physician anaesthetists have impacted negatively on the scope of operations done in these hospitals. There is a lot of collaboration between the mission hospitals and overseas partners. The supply of consumables and other agents are therefore better in these mission hospitals than most government hospitals.

### The future of anaesthesia

The scope of anaesthesia related services can only be expanded if there are adequate numbers of specialists in the country. Some of the areas that will be developed in the future include Acute Pain Service (APS), chronic pain management and Obstetric Epidural Analgesia.

There is the need to put in place strategies to attract young graduates to choose anaesthesia as a specialty.

The recent dwindling of the number of doctors choosing the specialty is a worrying development.

Advances in and the increase in complexity of surgical operations can only be achieved if there are adequate numbers of well trained physician anaesthetists.

### Conclusion

This paper has sought to highlight the development of anaesthesia in Ghana. It has highlighted where we were some years ago and the major changes that have taken place over the last 50 or more years. It is hoped the paper will stimulate healthy discussion among all medical practitioners who have the specialty at heart. It is also hoped that anaesthesia will make great strides in the next 50 years.

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