

Where there is no specialist: surgical care in a secondary health facility in a developing country

Olaogun Julius G.^a, Popoola Sunday O.^a, Olatunya Oladele S.^b, Oluwadiya Kehinde S.^a

^aDepartments of Surgery and ^bPaediatrics, Ekiti State University, Ado-Ekiti, Nigeria

Correspondence to J.G. Olaogun, FWACS, Department of Surgery, Ekiti State University, 360211 Ado-Ekiti, Nigeria
Tel: +2348035955949;
e-mail: olaogunjulius@yahoo.com

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Background

A major deterrent to providing qualitative surgical care in developing countries is the lack of adequate facilities and severe shortage of human resources. Therefore, most of the surgical workforce in rural areas and urban slums predominantly includes general practitioners with little formal training in providing surgical care. There is a need for constant review of patients' care in this setting with the aim of improving service delivery and conforming to the internationally acceptable standard of practice.

Materials and methods

A 5-year descriptive retrospective study, from January 2007 to December 2011, of general surgery cases at State Specialist Hospital Ikere-Ekiti (Nigeria) was carried out.

Results

A total of 80 patients underwent 85 surgical operations. Most of them (86.2%) had ward admission for a mean duration of 4.6±1.4 days. The most frequent elective operation was hernia repair [66 (77.7%)]; whereas that of emergency was appendectomy [seven (8.2%)]. Other operations included lumpectomy [three (3.5%)], hydrocelectomy [two (2.4%)] and orchidectomy and laparotomy [three (3.5%) each]. All patients received postoperative antibiotics, with 71.3% receiving two or more antibiotics. Fifteen (18.8%) patients had surgically excised specimens with no histopathological evaluation. Only four (5%) patients were followed up beyond 4 weeks. No mortality was recorded.

Conclusion

Surgical volume was grossly low and there is a need for the government to equip secondary healthcare centres with basic facilities and strengthen surgical capacity for maximum utilization and improved quality of care. Periodic training programmes for general practitioners to ensure strict adherence to the international best practices will be helpful. In addition, health education should be available for everyone to reduce sociocultural-related problems.

Keywords:

secondary healthcare, semiurban, surgical care

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Introduction

Surgery has assumed a significant role in global health and its importance cannot be overemphasized [1]. The recent estimates suggest that 11% of the global burden of disease can be treated with surgery and these conditions include injuries (38%), malignancies (19%), congenital anomalies (9%), complications of pregnancy (6%), cataracts (5%) and perinatal conditions (4%). These diseases may be cured, palliated or treated with surgical interventions even though they are rapidly growing with the increase in uncontrolled population worldwide [2].

Irrespective of the various preventive strategies in developing countries where conservative treatment is usually not readily available and there are a huge number of untreated surgical pathologies, these diseases will always account for a considerable proportion of a population's disease burden [3]. A major deterrent to providing qualitative and effective surgical care in developing countries is the lack of human resources.

There is a critical shortage of surgeons in Africa and rural areas are affected the most. Africa has less than 1% of the surgical workforce in comparison with USA, although a significant proportion of the disease burden is found in Africa [4]. Different studies from sub-Saharan African countries have confirmed the severe deficiencies in surgical capacity [5–7]. Nigeria is not exempt from these severe physician shortages including surgeons who prefer practicing in urban areas or in tertiary institutions that are better equipped and have a higher income base.

The workforce in the rural areas and urban slums predominantly includes medical officers/nonspecialist with only undergraduate formal training in providing surgical care. Henry *et al.* [8] showed that 52.1% of general practitioners constituted most of the surgical workforce in rural southern Nigeria. In an attempt to bridge the gap in the surgical workforce between the rural and urban areas and also to improve on service delivery vis-a-vis provision of safe and affordable surgery to rural and

urban slum dwellers, the Association of Rural Surgical Practitioners of Nigeria (ARSPON) was established in 2008 by a group of rural surgical practitioners [9]. The objective of ARSPON is to enhance and improve on the quality and standard of rural surgical practice in the country irrespective of where the practice is taking place through provision of training opportunities for doctors to acquire surgical skills in a short period that will enable them to perform safe and affordable surgery.

In Nigeria, most secondary health facilities are situated in rural and semiurban areas, where the majority of the population resides. The present audit of care of surgical patients in secondary health facility, which is the first of its kind in Ekiti State (Nigeria) was carried out. The idea is to determine surgical volume and management of surgical patients with the aim of improving our service delivery and conforming to the internationally acceptable standard of practice.

Materials and methods

This was a descriptive retrospective study of general surgical operations performed over a 5-year period from January 2007 to December 2011 at the State Specialist Hospital (SSH), Ikere-Ekiti, south-western Nigeria. The town is ranked second in terms of infrastructural development and has a population of 147 355 according to the 2006 census [10]. The major occupation of the inhabitants is farming. Besides trekking, their other mode of transportation is by land, using motors, motorcycles and bicycles. In addition to the SSH, where this study was carried out, it has five primary and many private health centres. Also located in the town are two tertiary and many secondary and primary educational institutions.

The hospital

The hospital is a government-owned secondary healthcare facility established in 1970 as a district hospital, but was later upgraded to a SSH in 2001 as one of the three specialist hospitals located each in the three senatorial districts of the state. It is an 80-bed hospital and serves as a referral centre for several private health institutions, maternity homes and primary health centres in the district. There are two tertiary health institutions in Ekiti State. The Ekiti State University Teaching Hospital (EKSUTH) and Federal Medical Centre (FMC), which are located in Ado-Ekiti and Ido-Ekiti, respectively, serve as referral centres for the SSH and all other hospitals in the state.

During the period of this study, there were six medical officers. Only the two surgically inclined medical

officers carried out all the surgeries. Currently, the hospital has specialists in the fields of general surgery and obstetrics/gynaecology on a permanent basis and other visiting specialists in paediatrics and orthopaedics.

The theatre registers, admission records in the different wards and follow-up clinic notes provided information on the total number of general surgical cases managed over the period. Surgical procedures such as suturing of lacerations and drainage of abscesses were performed in the outpatient department and were not properly recorded and were thus excluded from the study. The study was carried out after obtaining ethical consent from the hospital authority. Information extracted included the patients' demographic profile, diagnosis, treatment offered, complications and follow-up system. These data were analysed using the statistical package for the social sciences (SPSS, version 16; SPSS Inc., Chicago, Illinois, USA) software.

Results

There were two categories of surgical patients in this study. The first group included 132 patients who underwent surgical operations during periodic free surgical programmes organized by the Ekiti State government in collaboration with specialists from tertiary centres. There was paucity of information in the record of these patients. However, the theatre record showed that they had mainly herniorrhaphies, hydrocelectomy and lumpectomies and were treated as day cases.

The second group included 80 patients who underwent 85 general surgical procedures over the 5-year period. They were the routine patients who were duly registered, investigated properly and prepared for surgery. Their ages ranged from 8 to 95 years (mean 45.8 ± 9.7 years) and the majority [74 (92.5%)] were male patients. In terms of occupation, the patients were farmers [26 (32.5%)], students [22 (27.5%)], civil servants [13 (16.3%)], artisans [10 (12.5%)], commercial drivers/conductors [four (5.0%)] and others [five (6.2%)]. Most patients [69 (86.2%)] were admitted into the wards (mean duration 4.6 ± 1.4 days). Hernia repair [66 (77.7%)] was the most frequent procedure performed and this included 63 (74.1%) inguinal, [two (2.4%)] femoral and an incisional hernia (1.2%). Other elective surgeries included hydrocelectomy [two (2.4%)] and lumpectomy [three (3.5%)]. The emergency procedures were appendectomy [seven (8.2%)], orchidectomy [three (3.5%)] and exploratory laparotomy [three (3.5%)] in patients with traumatic splenic rupture, typhoid ileal perforation and adhesive intestinal obstruction with a gangrenous bowel.

The procedures were performed under general anaesthesia (GA) and local anaesthesia in 51 (63.8%) and 29 (36.2%) patients, respectively. All patients were administered antibiotics and 57 (71.3%) of them received two or more antibiotics for a variable length of time ranging from 3 to 8 days. Fifteen (18.8%) patients had postoperative surgical specimens, but none was submitted for histopathology evaluation in either of the tertiary health institutions (EKSUTH and FMCI) as the only centres with the facility for this analysis.

Postoperative complications were observed in 21 (26.3%) patients (Table 1).

Discussion

A total of 85 general surgical operations were performed over a 5-year period, about 0.3 case per week and an average of six procedures per 10 000 individuals. This showed a grossly low volume and significant gap between the range of surgeries that the WHO expects even in a district hospital and what is actually delivered in this specialist hospital and highlights underprovision of surgical services at this secondary level of care [11]. An average of 6–8 patients/month were being booked for elective surgery, but quite a number did not turn up perhaps because of financial constraints as more patients turned up for the free health programmes. The other more important reason could be the lack of specialists in this centre and the fact that the medical officers were not proficient in surgery. Also, cultural reasons and belief in alternative or traditional medicine are still very common among Africans. The Galukande *et al.*'s [12] study of three sub-Saharan African countries also showed a low number of surgical procedures ranging from 5 to 45 per 10 000 individuals. Although the incidence and prevalence of surgical conditions are not known here, global data have shown limited access to essential surgery in low-income and middle-income countries, which account for 70% of the world's population, with only 26% of 234 million estimated surgical procedures performed in these countries [13].

Table 1 Postoperative complications

Complications	N (%)
None	59 (73.7)
Pain	7 (8.7)
Wound infection	4 (5.0)
Chemical burns (scrotal)	2 (2.5)
Haematoma (wound, scrotal)	4 (5.0)
Bleeding	1 (1.3)
Urinary retention	2 (2.5)
Enterocutaneous fistula	1 (1.3)
Total	80 (100.0)

The reasons for the shockingly low surgical cases may not be unconnected with the deficiency of the surgical workforce during the period, which only comprised two of each medical officers, perioperative nurses and paramedical staff, with no specialist surgeon, nurse or physician anaesthetist. Many of the surgical cases did not go beyond the emergency department before referral to the tertiary health institutions in the state where the different specialist surgeons are concentrated. Ketamine was used for the procedures performed under GA and was administered by the paramedic who served in the 'anaesthetist' capacity on the instruction of the medical officer performing the surgery. This kind of task shifting is often considered a potential solution to the medical workforce crisis in low-income and resource-poor countries [14,15]. Although this might have aided healthcare delivery, the quality in the standard of care might not have been maintained.

During the period, the 132 patients who received free surgical operations were all treated as day cases and they had no case notes and proper documentation, and hence, were not available for analysis. This underscores the poor record-keeping system of the hospital, which is common in our healthcare facilities. Also contributing towards the low surgical procedures and male preponderance was the exclusion of obstetric and gynaecological cases.

The vast majority (86.2%) were admitted for a mean duration of 4.6 ± 1.4 days despite undergoing minor/intermediate surgeries. This could have increased the cost of care unnecessarily as most of these procedures could as well be performed as day cases with better patient selection and preparation had there been more expertise [16]. This was because the traditional practice of preoperative and postoperative admissions was still strictly observed. However, close interaction with the involved doctors showed that the type of anaesthesia (mainly GA) and the patient's anxiety about complications or undesirable conditions following discharge from hospital affected the length of stay postoperatively. It is worth noting that the other category of patients with similar diagnoses who received free surgical operations performed by specialists were treated as day cases in this same centre. This is to further buttress the unnecessary admission with attendant financial and physical burdens on the part of patients.

Hernia repair (77.7%) was the most frequent elective procedure performed, of which inguinal herniorrhaphy constituted the majority. This is similar to other studies in different countries worldwide. Approximately 75% of all abdominal wall hernias are seen in the groin and

about 20 million inguinal hernia repairs are performed globally every year [17–19]. In this study, about one-third of the patients (32.5%) were peasant farmers and this could have been the predisposing factor toward the development of hernia.

Only seven (8.2%) patients underwent appendectomy, which was the most common emergency procedure performed. Most patients who required this surgery could have been referred because of lack of human resources or could have presented at private hospitals in the area. The three patients who presented with testicular torsion all underwent orchidectomy. This was because of late presentation (>48 h) to the hospital, which is common in this part of the world. Rampaul and Hosking [20] also showed in their study that the major factor leading to orchidectomy in patients with testicular torsion was delayed presentation. Three (3.5%) patients underwent exploratory laparotomy for acute abdominal conditions – splenic rupture, typhoid ileal perforation and gangrenous bowel from adhesive intestinal obstruction. However, the patient who underwent splenectomy developed intraperitoneal haemorrhage that warranted re-exploration, whereas the one who underwent resection and anastomosis developed enterocutaneous fistula and was referred. The high complication rate following laparotomy might not be unrelated to the technical incompetence of the medical officers involved. A study in Malawi district hospitals also showed a low rate of laparotomies because only a few doctors were confident to ‘open acute abdomen’ for fear of encountering pathologies beyond their level of competence and thereby refer such cases [21].

All patients (100%) were prescribed a postoperative antibiotic, with 57 (71.3%) of them receiving two or more postoperative antibiotics. This routine antibiotic use was considered a preventive measure for surgical site infections in view of theatre inadequacies ranging from the lack of an ideal scrubbing room, free flowing water and sterilization equipment, making it difficult to achieve strict aseptic conditions. However, this routine practice of administration of antibiotics for every surgical intervention by the ‘surgeons’ in the hope of eliminating infection is short-sighted and is usually founded on custom, unsupported beliefs and adherence to dogma. However, the ideal would be to achieve standard of care by strict asepsis and using antibiotics for indicated purposes without masking poor clinical practice with antibiotics. Irrational or inappropriate prophylaxis, characterized by unnecessary use of broad-spectrum antimicrobial agents and continuation of therapy beyond the recommended period, can lead to bacterial resistance and unwanted side effects [22]. Besides, this also adds to the cost of care.

Fifteen patients had postoperative surgical specimens taken, but these were not submitted for histopathological examination. Interaction with the theatre staff showed that the patients were usually reluctant to submit a specimen, believing that it would add to the cost of care and also considered it unnecessary as the primary pathology had been removed. Also, it was possible that the stress of travelling to another place for submission could be responsible for the poor handling of the specimens, although some studies have shown that routine histopathological examination of certain specimens in the absence of any macroscopic abnormality may not be necessary considering the rarity of incidental findings relevant to patient management [23,24]. Raymond *et al.* [25] highlighted the importance of sending excised tissue for microscopic examination to confirm diagnosis and avoid missing unexpected malignancy with serious medicolegal consequences and Swank *et al.* [26] showed that routine histopathology of appendectomy specimens cannot be judged as useless. Considering the lack of trained surgeons who are experienced in detecting a macroscopic abnormality of excised surgical specimens in this hospital and most secondary health centres in the country, it is advisable that specimens are sent for further investigations not to compromise the quality of care. Therefore, the practice of leaving it to the discretion of the patients to take a specimen for histopathological examination should be stopped as most patients will not comply because, as far as they are concerned, their problems have been solved and they therefore would not see any reason to ‘waste’ money and time pursuing investigations of little benefit.

That no mortality was recorded might delude one into thinking that the quality of care was acceptable. However, a true indication of the quality of care is the fact that all three patients who underwent laparotomies developed complications, two of which were serious enough to warrant re-exploration in one case and referral in the other. Other morbidities such as acute urinary retention, scrotal burns and haematoma following herniorrhaphy were managed successfully. Long-term complications such as hernia recurrence could not be ascertained because of the short follow-up period as only four (5%) of patients were seen beyond 4 weeks.

Conclusion/recommendation

Eighty-five general surgical procedures over 5 years in a secondary health facility are grossly low on the basis of the average of 6–8 patients being booked for operation in a month. There is a need for the government to equip these institutions with basic facilities for smooth and safe administration of anaesthesia and monitoring

of patients and also to strengthen surgical capacity by engaging the services of anaesthetists and specialist surgeons. This will restore confidence at this level of care, improve patients' patronage and reduce delay in management associated with referral to tertiary centres with attendant morbidity and mortality. Financial incentives and special welfare packages should be instituted to encourage specialists to work in rural hospitals or secondary healthcare facilities. Also, periodic training programmes should be organized for medical officers and theatre staff with the aim of improving their knowledge of patients' management and conform to internationally acceptable practices. Health education should be available for everyone to eradicate patients' belief in alternate practitioners who are actually practising without any scientific proofs.

Acknowledgements

Conflicts of interest

None declared.

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