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Surgery in Malawi – a national survey of activity in rural and urban hospitals

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ABSTRACT

INTRODUCTION Malawi is a poor country with few doctors. It has 21 district hospitals all of which have operating theatres but none of which has a permanent surgeon. It also has 4 central hospitals, each with one or more surgeons. Most district hospitals are manned by a single doctor and two or more paramedical clinical officers.

PATIENTS AND METHODS All district and central hospitals were visited, and theatre logbooks analysed. All cases performed in 2003 were recorded.

RESULTS In 2003, a total of 48,696 surgical operations were recorded, of which 25,053 were performed in 21 district hospitals and 23,643 in 4 central hospitals. Caesarean section is the commonest major surgical procedure in district hospitals and is performed in approximately 2.8% of all births, compared to 22% in the UK. Very few major general surgical or orthopaedic procedures are carried out in district hospitals.

CONCLUSION This study underlines Malawi's need for more surgeons to be trained and retained.

KEYWORDS

Audit – Surgery – Malawi

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Malawi is a small, but densely populated, country in sub-Saharan Africa. The population is approximately 12 million.[1] The average income is less than one UK pound a day and it is currently ranked as one of the poorest and least developed countries in the world – 55% of the population is below the international poverty line of one US dollar per day.[2] It has a network of 21 district hospitals, one in each rural health district, and four central hospitals in the four major urban areas. Together, these government hospitals cover approximately 60% of the country's health needs. In addition, there are several mission and independent hospitals which together cover the other 40%. There has been recent interest in district hospital surgery in Africa with the publication of the new World Health Organization book Surgery at the District Hospital[5] encouraging surgery to be done at a district level where it is needed rather than being transferred to tertiary centres. There has also been investment in district surgery in Malawi recently with the completion of two European Union funded district hospitals in the south of the country. Both of these have several operating theatres. There are only 15 trained surgeons of any specialty in Malawi and there are no surgeons stationed at any of the district hospitals. Most district hospitals have one doctor, the district health officer, who is recruited straight from internship and is busy with running the hospital and health district as well as overseeing the clinical work. The district health officer is helped by a number of clinical officers who are paramedic clinicians with 4 years' practically orientated training. Surgeons from central hospitals also periodically visit the districts to run clinics and sometimes to operate. We decided to investigate exactly what surgery was being done in the country as a whole. We have already reported a limited survey of district activity.[4] This study examines surgical activity over a 1-year period in both district and central hospitals.

Patients and Methods

Two of the authors visited every district and central hospital in Malawi over the course of 2004 as part of routine clinical support visits. They met with the district health officer or clinical officers involved with surgery and reviewed the operating theatre log book. All operations done in the operating theatres in 2003 were recorded. In many hospitals, procedures such as drainage of abscesses were done in the out-patient departments and were not recorded. Eye operations were often done by visiting teams who kept separate records. These were not recorded. Operations were classified into the categories outlined in the

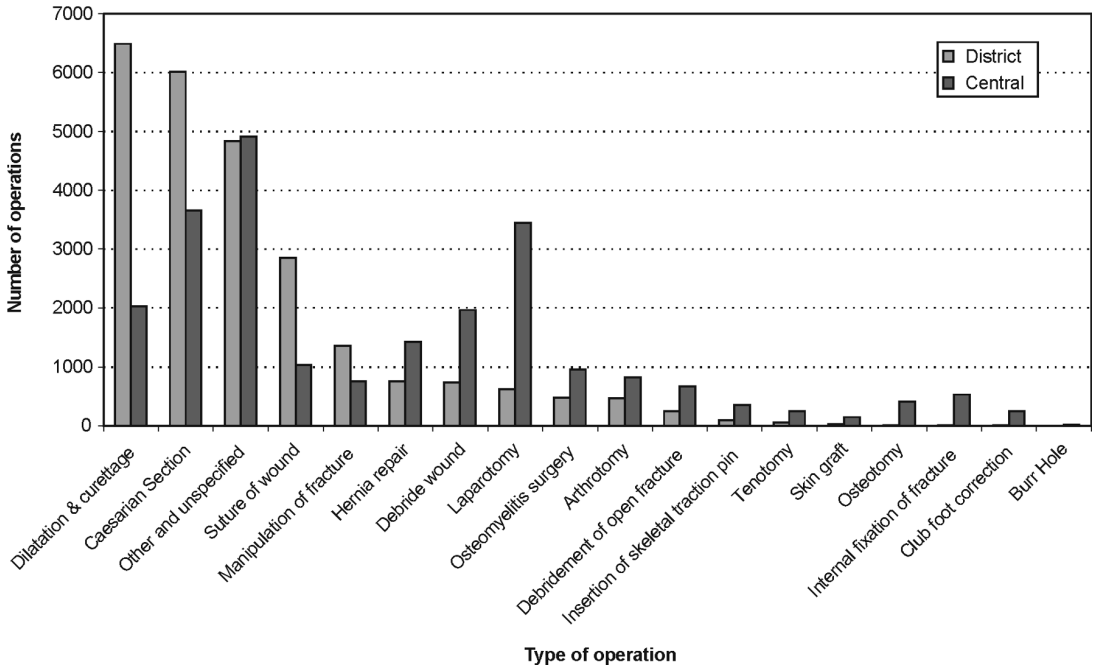

Figure 1 Operations in district and central hospitals in Malawi in 2003. Total number of operations 48,696 of which 25,053 in district hospitals and 23,643 in central hospitals.

results section below. The category marked 'other and unspecified' contains all operations that do not fall in to the categories outlined and any operation where the writing in the theatre logbook could not be deciphered.

Results

There were a total of 48,696 operations recorded, of which 25,053 were performed in the 21 district hospitals and 23,643 in the 4 central hospitals. They are outlined in Table 1 and illustrated graphically in Figure 1.

Discussion

The figures presented are as accurate a representation of major surgical activity in government institutions in Malawi as we were able to measure. It is recognised that there are significant limitations in the methodology, as operations not recorded in the theatre log are not measured. Minor and intermediate procedures carried out in out-patient and other departments were thus not measured. It is estimated that up to 40% of medical and surgical activity in Malawi occurs in mission hospitals and other non-governmental private facilities. Figures were not obtained from these institutions.

The single most common operation was caesarean section with a total of 9679 cases. The Malawi National Statistics Office[5] estimates that there were 578,000 births in 2003. If we assume that 40% of these births take place at or under the care of mission and private institutions that leaves 346,800 births in the population covered by our survey, and a caesarean section rate of 2.8% of births. This is considerably lower than the caesarean rate in the UK which in 2003 was 22%.[6] It is highly likely that many women who need caesarean section have to deliver vaginally and are a risk of complications such as vesicovaginal fistula. Malawi's high rate of maternal mortality (1100 maternal deaths per 100,000 live births) and infant mortality (110 deaths in the first year of life per 1000 live births) are also likely to be related to the low caesarean section rate.[7] The first author has seen many cases of cerebral palsy in his orthopaedic practice in Malawi. The prevalence of this condition is not known, but a significant proportion of these may have been avoidable if caesarean section was more readily accessible.

At the time of performing this study, we were not aware of any other national surveys of surgical activity; however, since the study was performed, we have been alerted to a similar survey carried out by Fenton between 1993 and 1995, and published in a non-indexed journal.[8] He reports on surgical activity in 18 district and mission hospitals which he estimated to cover a population of 6,100,000. He also found caesarean section to be the commonest major operation performed, with records of 7288 cases over his 2-year study period. There are no published figures on the number of births in his population over his study period; however, if an estimate of 250,000 births per year is made, then the caesarean section rate in his population is 1.5% which is just over half the rate we found 10 years later.

The second commonest procedure we recorded was dilatation and curettage with 8522 cases. Our survey does not give

any indication as to why these were performed; however, in a country where abortion is illegal, it is certainly possible that a proportion of these were performed to terminate pregnancy. These two obstetric and gynaecological procedures, namely caesarean section and dilatation and curettage, comprise 37% of all operations.

Laparotomy and hernia repair comprise the two commonest general surgical procedures and these are mainly carried out in the four central hospitals. It is interesting that in 21 district hospitals equipped with theatres only 618 laparotomies are carried out in a year. This is compared to 3444 in the 4 central hospitals. One has to question why more laparotomies are not done in district hospitals. This study did not set out to answer this question but, on talking to several clinical officers in districts, most of them are happy to perform a caesarean section as they feel confident that they have the technical competence to deal with whatever pathology they may find, while few of them feel confident to open an acute abdomen for fear of encountering a condition that is beyond their level of competence. They thus refer acute abdominal cases to central hospitals. This study did not look at referral and transport delays but it is likely that both of these are major factors and cause considerable increase in morbidity and mortality in patients with acute abdominal pathology.[9]

It is curious that the common and simple orthopaedic procedure of Steinmann pin insertion appears to be more often done in central hospitals. This is usually associated with the management of femoral fractures and is easily performed in a district hospital. It is possible that most pin insertions in districts are done on the ward or in the emergency room on admission, and thus not recorded in this study.

Table 1 Operations in district and central hospitals in Malawi in 2003

Procedure	District	Central	total
Dilatation and curettage	6489	2033	8522
Caesarean section	6017	3662	9679
Other and unspecified	4845	4918	9763
Suture of wound	2851	1032	3883
Manipulation of fracture	1360	757	2117
Hernia repair	753	1424	2177
Debride wound	735	1966	2701
Laparotomy	618	3444	4062
Osteomyelitis surgery	483	956	1439
Arthrotomy	466	822	1288
Debridement of open fracture	242	673	915
Insertion of skeletal traction pin	92	356	448
Tenotomy	52	247	299
Skin graft	26	146	172
Osteotomy	10	404	414
Internal fixation of fracture	8	532	540
Club foot correction	5	251	256
Burr hole	1	20	21
Total operations	**25,053**	**23,643**	**48,696**

More complicated procedures like burr holes are only done in central hospitals. The same goes for the more technical elective procedures such as club foot surgery, corrective osteotomies, and osteomyelitis surgery. It should be noted here that the last 5 years have seen the establishment of postgraduate surgical training in Malawi in both general and orthopaedic surgery. More technical procedures such as arthroscopy, joint replacement and spinal surgery are now being performed;[10] however, the volumes are low and do not yet impact national statistics.

Conclusions

The important facts emerging from this survey are that obstetric and gynaecological procedures dominate the surgical caseload in district hospitals in percentage terms, while laparotomies and more complex procedures are predominantly done in central hospitals. Despite the high percentage of surgery being caesarean sections, the rate of caesarean section is very low compared to the UK and it is likely that delay in labour is a significant cause of the country's high maternal and infant morbidity and mortality, an a probable cause of much cerebral palsy.

The small number of surgical procedures performed in the country as a whole reflects the small numbers of medical professionals in Malawi, and supports the efforts being made by the Ministries of Health and Education both to train and retain more doctors and clinical officers.

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