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MINOR SURGERY AT HOSPITALS AND CLINICS IN A KENYAN DISTRICT
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MINOR SURGERY AT HOSPITALS AND CLINICS IN A KENYAN DISTRICT

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ABSTRACT

Background: **Minor surgical operations are performed at almost all hospitals, health centres and dispensaries in Africa. A large proportion of the operations are urgent, prompted by injuries and acute infections. They are rarely recorded and reported systematically, and rates and patterns are poorly known.**

Objective: **To describe of all minor surgery performed on a rural African population during one year.**

Design: **Prospective recording and analysis of minor surgical procedures and of the patients undergoing the same procedures.**

Setting: **Hospitals, health centres, dispensaries and mission clinics in Meru district, Kenya.**

Results: **Out of 26,858 minor operations performed (2,066/100,000 people/year) 22,838 were done at the five hospitals in the district while 2,510 were done at 49 mission clinics (4.3/clinic/month), 764 at ten health centres (6.4/health centre/month) and 620 at 29 dispensaries (1.8/dispensary/month). The most common operations were episiotomy, tooth extraction, wound suture and incision and drainage of abscess. More minor surgery is done on women than on men, and the difference is related to obstetrical procedures.**

Conclusions: **Relatively few operations were performed at health centres, dispensaries and mission clinics. Possible explanations include perceived quality of care, staff motivation, poor service access outside office hours and service charges.**

INTRODUCTION

Minor surgery is performed in out-patient departments and main theatres of most African hospitals. When performed on in-patients, minor and major operations are all noted in the patients' medical records but rarely categorised. If done in a hospital theatre they appear also in the theatre registration book. A limited range of minor operations such as wound suture, tooth extraction and incision of boils are done also at health centres, dispensaries, and mission clinics, but they are not always recorded and are rarely reported, hence poorly known. We know little about what minor surgery takes place at hospitals and at smaller clinics, and no population-based estimate of total minor surgery output in Africa has been encountered.

Several studies of minor surgery emanate from the UK. Bull(1) described two health centre practices in East Oxford with a total patient list of 21,000. During 1972, twenty five procedures per 1000 patients were undertaken. Wall(2) reviewed seven years of minor surgery in a small hospital and found that the most common procedures were excision of skin lesions, sigmoidoscopy, circumcision and ligation of varicose veins. Later Wall(3) reported nine years of surgery, concluding that minor surgery in general practice is inexpensive, has a low complication rate and high patient satisfaction.

Brown(4) reviewed surgical operations at a seven-doctor practice serving 19,000 people in Kent, England. During one year 190 patients were subjected to surgery, mostly wound suture, diathermy of warts and sclerotherapy of varicose veins. The average cost to the practitioner was five sterling pounds per operation while the cost of similar operations in hospital was estimated seventy eight sterling pounds. He concluded that the disincentive was financial and that charges similar to those for other services would encourage more surgery.

Menon(5), who summarised his minor surgery in Essex during five years, found 481 operations: 289 on skin conditions, 80 were injection sclerotherapy of varicose veins, 43 injections of haemorroids, 26 incision and drainage of abscess and 20 vasectomies. Patients appreciated proximity to home, familiarity with the local staff and choice of a convenient time for the operation. Humby(6) drew similar conclusions from a review of minor surgery performed by English practitioners.

Watters and Bayley(7) included minor operations in a one-year study of surgery at eight Zambian hospitals and found large differences between hospitals, explained partly by variations in trained staff, but operations done at smaller clinics were not included. Population based annual outputs of minor surgery at Kenyan and Tanzanian hospitals in the early eighties have been estimated by Nordberg(8) on the basis of hospital annual reports. Annual rates were 4 - 10 per 1000 population, but these figures only include hospital surgery and not operations done at small clinics.

The output of minor surgery was included in a one-

year study of a joint government/Catholic mission hospital in western Kenya(9). The most common operations were wound suture, tooth extraction, incision and drainage, evacuation of the uterus, closed reduction of fractures and excision/biopsy, and the estimated minor surgery rate in the catchment area was 1286/100,000. The study did not include operations performed outside hospital at health centres and clinics. A study of minor surgery output and resources at small rural health facilities in Kenya showed no association between output and resources(10).

The objective of this study was to explore the pattern of minor surgical procedures performed in a rural district in Kenya.

MATERIALS AND METHODS

At the time of the study the project area, Meru district, had five hospitals, ten government health centres, 34 government dispensaries and 60 mission clinics which include; 30 Presbyterian, 29 Catholic and one Methodist. There were also three private nursing homes.

As minor operations are not routinely and consistently recorded by the service providers, all facilities under study were requested to record prospectively all minor operations performed over a twelve month period from mid-1989 to mid-1990. The recorded information included sex and age of patient, condition/ illness prompting the operation, type of operation, type of anaesthesia, title of operator and title of anaesthetist, if any. Record books and instructions were given to hospital-based supervisors for distribution to all clinics under their respective supervision. Due to transport difficulties and temporary absence of local staff there were some local delays in the distribution of books and instructions, and the twelve-months recording periods were not all simultaneous. Demographic projections based on the 1979 census were used for estimates of surgical rates.

Handwritten primary data recorded by the staff at health facilities were coded at the Medical Research Centre, Kenya Medical Research Institute ((KEMRI) in Nairobi, entered into a micro-computer and processed with the help of dBase III and Epi-Info software programmes.

RESULTS

Information about 27,000 minor operations performed in Meru district during one year was obtained. Of these operations, 22,800 were done at the five hospitals. These were in addition to the 3,415 major operations also performed at these hospitals during the same period. The ten government health centres reported 764 and the 29 dispensaries reported 610 operations while reported 49 mission clinics reported 2,510 operations. Most facilities submitted twelve consecutive monthly reports but some were less consistent. The average number of operations during the months for which reports were obtained were 6.4, 1.7 and 4.3 for health centres, dispensaries and mission clinics respectively. If we assume that non-reporting clinics did no surgery at all, the monthly averages are 6.4, 1.7 and 3.5 respectively.

The total number of minor operations by type of operation and by type of institution (Table 1) show that some categories of operations such as uterus curettage, uterus evacuation, amputation, tendon repair, closed reduction of fractures and biopsy were done exclusively at hospitals while others, for example wound suture, drainage of abscess and tooth extraction, were common also at smaller institutions. Minor surgery rates per 100,000 people are based on the estimated total population in the district at the time of the study.

Table 1

One-year output of minor operations by type of operation and by type of institution

Operation	Hospitals	Govt H.C. & Disp.	Mission clinics	Nursing homes	Total	Op. per 100000 pop.
Tooth extraction	6,040	263	1104	0	7,407	570
Wound sutures	2,644	697	891	61	4,293	330
Incision and drainage	1,931	267	496	3	2,697	207
Dilatation/curettage	823	1	0	2	826	64
Evacuation of uterus	421	0	0	2	423	33
Excision	451	2	1	1	455	35
Foreign body removal	365	23	3	0	391	30
Fracture: closed red	246	0	0	0	246	19
Tendon repair	231	0	0	0	231	18
Circumcision	189	0	15	0	204	16
Biopsy	148	0	0	1	149	11
Skin graft	97	0	0	0	97	7
Cutdown	95	0	0	0	95	7
Amputation of finger/toe	70	0	0	0	70	5
Urethra dilatation	67	0	0	0	67	5
Aspiration of abscess	60	0	0	0	60	5
Episiotomy	8,960	129	–	58	9,147	704
Total	22,838	1,382	2510	128	26,858	2,066

In Meru district, hospitals performed 1,754 minor operations per 100,000 people during one year while 321/100,000 were done outside hospital.

Minor operations performed in hospitals are listed by age and sex of patients in Table 2. Wound suture, incision and drainage; and tooth extraction were the most frequent in both sexes, and dilatation and curettage and uterus evacuation were also very common in women of childbearing age. Of the 6,381 operations on males, 18.1% were done on boys below 15 years, and the corresponding proportion for girls was 14.6%.

The range of health centres and dispensaries operations was much narrower, and the most common operations at health centres were wound suture, tooth extraction, episiotomy and incision and drainage (Table 3). The volume was small, corresponding to about two operations per health centre per week and two per dispensary per month; and 27.6% of male operations at health centres were done on boys below the age 15 years, mainly sutures in boys aged 5-14 years. Of all health centre operations done on females 17.6% were on girls below 15 years.

Table 2

One year output of minor operations at hospitals in Meru district by age and sex

Operation	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Adults		Total	
	Age 0-4 yrs		Age 5-14 yrs		Age 15-44 yrs		Age 45-64 yrs		Age <65		Male	Female		
Tooth extraction*	2	0	2	6	9	12	3	2	0	0	3004	3000	3020	3020
Wound suture	58	80	381	279	935	583	103	95	18	27	37	48	1532	1112
Incision and drainage	73	151	183	171	266	636	20	41	8	15	5	7	555	1021
Excision	20	12	34	33	93	135	45	35	9	6	15	14	216	235
Circumcision	2	-	55	-	132	-	0	-	0	-	0	-	189	-
Foreign body removal	36	54	39	33	65	91	10	20	2	6	3	6	155	210
Fracture: closed red	12	12	62	55	63	10	14	7	0	1	2	8	153	93
Tendon repair	2	0	41	18	88	37	7	3	1	8	10	16	149	82
Incision only	24	47	23	39	53	120	5	11	1	0	5	27	111	24
Urethra dilatation	0	-	1	-	36	-	17	-	8	-	5	-	67	-
Biopsy	3	1	6	7	26	51	10	20	14	5	3	2	62	86
Amputation of finger/toe	11	3	9	3	23	6	4	3	2	2	3	1	52	18
Cutdown	31	42	10	3	0	6	2	0	0	1	0	0	43	52
Skin graft	4	3	17	10	19	33	2	6	0	2	0	1	42	55
Aspir. of abscess	7	8	9	7	14	9	5	1	0	0	0	0	35	18
Dilat. and curettage	-	0	-	11	-	764	-	18	-	0	-	30	-	823
Evacuation of uterus	-	0	-	4	-	405	-	11	-	1	-	0	-	421
Total	285	413	872	679	1822	2898	247	273	63	74	3092	3160	6381	7497

* In addition, a dental unit at Meru District Hospital did 400 - 700 tooth extractions per month. There is a similar unit at Chogoria Hospital.

Table 3

One-year output of surgery at Government health centres

Operation	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Adults		Total	
	Age 0 - 4 yrs		Age 5 - 14 yrs		Age 15 - 44 yrs		Age 45 - 64 yrs		Age <65		Male	Female	Male	Female
Wound suture	1	2	53	32	111	68	6	12	4	1	15	14	190	129
Tooth extraction	3	2	26	26	60	61	13	18	1	3	6	5	109	115
Incision and drainage	3	3	5	9	23	29	1	8	0	0	2	6	34	55
Incision only	1	0	1	1	1	3	0	0	0	0	0	0	3	4
Vasectomy	0	-	0	-	1	-	0	-	0	-	0	-	1	-
Episiotomy	1	-	-	0	-	121	-	0	-	0	-	0	-	121
Dilat. and curettage	-	-	-	0	-	1	-	0	-	0	-	0	-	1
Foreign body removal	-	-	-	0	-	2	-	0	-	0	-	0	-	2
Total	8	7	85	68	196	285	20	38	5	4	23	25	337	427

Table 4

One year output of surgery at Government dispensaries

Operation	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Total	
	Age 0 - 4 yrs		Age 5 - 14 yrs		Age 15 - 44 yrs		Age 45 - 64 yrs		Age <65		Adults		Male	Female
Wound suture	10	3	60	24	135	74	19	16	4	0	21	11	249	128
Incision and drainage	4	2	18	10	61	18	8	2	0	0	6	5	97	37
Incision only	0	2	2	5	13	13	1	0	0	0	1	0	17	20
Tooth extraction	0	0	1	1	7	13	5	6	2	3	0	1	15	24
Foreign body removal	1	1	2	1	4	8	0	4	0	-	0	-	7	14
Entropion	0	-	1	-	0	-	1	-	0	-	0	-	2	-
Excision	-	0	-	0	-	2	-	0	-	0	-	0	-	2
Episiotomy	-	0	-	0	-	8	-	0	-	0	-	0	-	8
Total	15	8	84	41	220	136	34	28	6	3	28	17	387	233

Table 5

One year output of surgical operations at Presbyterian NGO clinics

Operation	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Total	
	Age 0 - 4 yrs		Age 5 - 14 yrs		Age 15 - 44 yrs		Age 45 - 64		Age <65		Adults			
Wound suture	3	5	103	38	190	105	20	9	2	2	5	1	323	160
Tooth extraction	7	3	51	64	180	244	44	52	5	0	1	0	288	363
Incision and drainage	10	30	45	26	55	66	8	10	0	1	0	1	118	134
Incision only	2	2	5	6	13	11	2	0	0	0	0	0	22	19
Circumcision	0	-	9	-	6	-	0	-	0	-	0	-	15	-
Excision	0	-	0	-	1	-	0	-	0	-	0	-	1	-
Foreign body removal	-	3	-	0	-	0	-	0	-	0	-	0	-	3
Total	22	43	213	134	445	426	74	71	7	3	6	2	767	679

Table 6

Output of surgical operations at Catholic clinics by sex and age

Operation	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Total	
	Age 0 - 4 yrs		Age 5 - 14 yrs		Age 15 - 44 yrs		Age 45 - 64 yrs		Age <65		Adults			
Tooth extraction	3	2	34	34	119	123	41	48	10	7	13	19	220	233
Wound suture	9	12	61	34	103	88	8	6	14	12	13	8	208	160
Incision and drainage	6	8	20	25	30	34	1	4	1	1	1	0	59	72
Incision only	9	9	16	7	15	14	0	1	2	1	1	5	43	37
Total	27	31	131	100	267	259	50	59	27	21	28	32	530	502

At government dispensaries, the range of surgery was equally narrow, with wound suture and incision and drainage dominating (Table 4). Twenty six per cent of male operations were done on boys below 15 years and, again, most operations on boys between five and 14 years of age were wound sutures while girls were 21%.

The pattern of operations as well as the volume of surgery at mission clinics was essentially the same as at government health centres (Tables 5 and 6). Wound suture and tooth extraction was the most common operation overall in boys and girls aged five to fourteen years. The three private nursing homes in Meru provided mostly child delivery services. Procedures performed at these institutions included episiotomies, suturing of perineal tears and included occasionally suturing of wounds and drainage of abscesses.

DISCUSSION

The dividing line between "major" and "minor" surgery is not distinct, and this makes comparison between areas and institutions difficult. In the past, surgery requiring general anaesthesia was conveniently classified as major, but new anaesthetic techniques used for operations of different degrees of complexity have made this criterion

invalid. It is common to include among major operations hydrocelectomy, hernia repair, arm or leg amputation and open reduction of fractures. Minor operations include, for example, closed reduction of fractures, dilatation and curettage of the uterus, finger/toe amputation and skin grafting.

In the present study, reporting was not entirely complete. The hospitals probably recorded all operations with the possible exception of procedures performed in the wards which may have escaped the recording procedure. A considerable number of episiotomies are likely to have escaped recording in this way. Many of the small facilities reported on a few months only, claiming that during some months no operations were done, so reporting seemed unnecessary. Other clinics submitted no reports at all, stating that they had no surgery to report. While this may be true, it could also be a convenient way of avoiding extra work associated with project-related recording and reporting, which was not materially rewarded. The reasons given from a few non-reporting facilities were that recording forms had not arrived; or that transfer of the person in charge when the project was ready to start left local staff uninformed; or that the recording and reporting procedures were not fully understood by the local staff; or that so minor surgery was done that it seemed pointless to report it. At several clinics, the recording started late.

A simplified recording procedure was applied to 9,187 hospital episiotomies performed on women during child delivery, and they therefore had to be excluded from some of the tables. The authors believe that, with the possible exception of numerous tooth extractions, only a small proportion of all operations were missed, and in the case of small clinics where the recording period was shorter than twelve months we were able to calculate the mean monthly output.

It is difficult to compare the Meru figures with those of other African studies of minor surgery. No previous total population-based figures have been encountered by the authors. However, relative frequencies, or patterns of minor surgery, have been found in the Zambian study reported by Watters and Bailey(7) and in annual reports of hospitals elsewhere in East Africa(8). The pattern is generally much the same, but more wound sutures and fewer reduction of fractures are reported from Meru than from these other areas.

Brown(4), reported data of a one year operation rate of 190 per 19,000 people at one general practice, or 1000 per 100,000. These did not include minor operations done elsewhere on the same population and certainly excluded tooth extractions.

Were women underserved? Sex differences were small and attributable to epidemiological factors. Males everywhere had a higher injury rate which is reflected in higher numbers of wound suture and reduction of fracture. In women, reproductive system disorders and obstetrical complications are associated with a certain amount of surgery in reproductive age groups. Given these differences no evidence was found that women were surgically underserved. However, the need for surgery in rural African males and females has been estimated only for a few major procedures(11), and the question of unmet needs - in both males and females remains largely unanswered.

With 82% of all minor surgery taking place at the five hospitals and only 18% at over 90 small clinics, each doing less than seven minor operations per month, one must ask why more is not done at the smaller institutions. Resources do not seem to be a significant limiting factor at this output level(10) so there is need to look for other explanations such as training, motivation and incentives. More practical surgical skills should be taught during basic training of clinical officers and community nurses, and hospital doctors should encourage middle-level staff to be more active in doing minor surgery with and without supervision. The quality of surgery at small clinics should be evaluated. Incentives in the form of user charges should be introduced at health centres and possibly also at dispensary level.

There is room for decentralisation of much out-patient hospital surgery to health centres, dispensaries and mission clinics, and current obstacles should be further explored. It would be helpful to test, at a few institutions over a period, the impact of incentives on surgical output. There is also a good case for monitoring the quality of surgical care and for reviewing the theoretical and the practical surgical training at medical training colleges and nursing schools.

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