Outside Europe

Incidence and estimated need of caesarean section, inguinal hernia repair, and operation for strangulated hernia in rural Africa

ERIK M NORDBERG

Abstract

Numbers of caesarean sections, inguinal hernia repairs, and operations for strangulated hernia performed in 1979-81 at 10 rural hospitals in eastern Africa were matched against estimated populations in the respective catchment areas. Annual rates of each operation varied considerably between hospitals, the averages being: for caesarean sections 25 per 100 000 per year; for inguinal hernia repairs 25 per 100 000 per year; and for operations for strangulated hernia four per 100 000 per year. The estimated minimum needs for these operations, based on available data for morbidity were 225, 175, and 30 per 100 000 per year, respectively.

Numerous deaths and cases of permanent disability occur in remote rural villages because common conditions requiring urgent surgery are neither prevented nor properly cared for. A balanced improvement of both primary and secondary care in rural Africa is needed.

Introduction

Surgery conducted in industrialised countries is relatively well documented, particularly major surgery performed on in-patients.[1-6] Published data from less developed countries are scarce, and no population based figures for surgical output figures have been presented from eastern Africa. Data in annual reports from hospitals are difficult to relate to well defined catchment areas or to specific populations.[7] This report presents for eastern Africa the rates of and related estimated needs for caesarean sections and inguinal hernia repairs (currently the two most common major operations in the area) and operations for strangulated hernia. These operations are particularly important in rural Africa where trained surgeons are few, distances between hospitals large, and transport rarely readily available.

Method

Statistics for surgical output, including numbers of operations by kind during 1979, 1980, and 1981, were obtained from 10 rural hospitals in Kenya, Tanzania, southern Sudan, and Ethiopia. Some of these hospitals prepare annual reports containing such information; those that do are almost exclusively hospitals with some degree of support from non-government organisations overseas. Such support, received by about one third of hospitals in eastern Africa, is generally associated with more qualified staff, many of them expatriates, better supply, and some form of fee for service system. Other hospitals, selected as representing ordinary rural district hospitals that do not receive help from non-government organisations, extracted the necessary information for this study from their operation theatre record books. All figures for surgical output were related to the population of the respective catchment area of each hospital as estimated by the management of the hospital concerned or, in a few cases, by me on the basis of census returns and hospital estimates of the size of the catchment area.

Needs for surgical operations were estimated on the basis of relevant published figures for incidences and prevalences of hernia, intestinal obstruction, and high risk delivery. Needs, as estimated in this article, reflected a slightly lower degree of safety and comfort than is considered to be appropriate in more affluent societies.

Results

The hospitals studied reported two to 100 inguinal hernia repairs performed per year per 100 000 of the catchment area population. Numbers were on average below 10 for government district hospitals not receiving support from non-government organisations and above 25 for hospitals receiving help from non-government organisations. Annual numbers of operations for strangulated hernia at the same hospitals varied from 0 to 14 per year per 100 000, again with the higher rates at hospitals supported by non-government organisations. Rates of caesarean section were from four to 25 at purely government hospitals and from 20 to 62 at the hospitals supported by non-government organisations (table).

ESTIMATED NEEDS FOR SURGERY

Four thousand to 5000 deliveries take place annually in an average east African population of 100 000. The proportion of deliveries at

Rates of selected major operations at hospitals in Eastern Africa, 1979-81

Hospital No	Caesarean sections/ 100 000/year	Inguinal hernia repairs/100 000/year	Strangulated hernia operations/100 000/year
	Hospitals supported purely by the government		
1	13	15	2
2	24	2	0
3	10	9	0
4	25	6	2
5	4	11	2
	Hospitals receiving help from non-government organisations		
6	20	35	4
7	43	26	2
8	44	72	5
9	36	56	7
10	62	100	14

African Medical and Research Foundation, PO Box 30125, Nairobi, Kenya
ERIK M NORDBERG, MD, medical director

Correspondence to: Dr E M Nordberg, Jungfrugatan 15, S-114 44 Stockholm, Sweden.

high risk is large, mainly because of a high incidence of cephalopelvic disproportions[8 9] and a high proportion of multiparas. Caesarean section is therefore medically justified in a comparatively high proportion of deliveries. It has been considered appropriate in three to 10% of deliveries elsewhere, but opinions differ.[10 11] Assuming, rather cautiously, that caesarean section is justified in an average of 5% of all deliveries in eastern Africa, there would be a need for 200-250 sections annually in a population of 100 000. As the table shows, only 20-30 of these, apparently, are currently performed.

The limited data available on the prevalence of hernias suggest a higher prevalence in Africa than in North America and Europe[12 13]; on this basis the inguinal hernia incidence is estimated, very approximately, to be similar. A higher prevalence in Africa may be due to an accumulation over many years of cases that have not undergone surgical repair. The true incidence in Africa is, however, higher than indicated by the prevalence because some of the pool of accumulated patients with hernia die each year from strangulation and intestinal obstruction without access to surgical intervention[14] and are thus excluded whenever a study of prevalence is carried out.

The rate of repairs for hernia in many countries outside Africa is well documented and to some extent helpful in estimating the need for such surgery in Africa. The number of inguinal hernia repairs per 100 000 population was in 1975 in the United Kingdom 209 for males and 22 for females[1]; in 1977 in Sweden 368 for males and 46 for females[5]; and in 1979 in the Netherlands 302 for males and 48 for females.[3] A few of these were second operations for recurrences. The true incidence of hernia in need of repair is higher than suggested by these figures; contraindications and non-compliance in some patients partly explain this difference. Hence, assuming an incidence similar to that in industrialised countries and a need to repair a slightly smaller proportion of hernias in Africa than in Europe and North America, I estimate the average need for inguinal hernia repair in eastern Africa to be about 175 per 100 000 people per year. Currently about 25 of these operations per 100 000 are carried out. To eliminate the pool of accumulated hernias a much higher rate of operation would be required over many years.

As strangulated hernia is the most common cause of intestinal obstruction in eastern Africa[15 16] large numbers of obstructions may be assumed to occur in inhabitants of remote rural villages who do not then receive modern medical care; many of them probably die without being seen at any modern health facility and without appearing in any statistical returns.[17] The incidence of strangulation is related to the prevalence of hernia in the population and therefore likely to be far higher in Africa than in Europe. In the United Kingdom the incidence is 15-20 per 100 000 per year,[18] and the African incidence can be estimated at 30, almost all needing urgent surgery. Only three or four of these necessary operations are currently carried out.

Discussion

Figures for surgical output in this paper are probably fairly accurate, although wide variations between the 10 hospitals make averages rather uncertain. Figures for populations of catchment areas, on which surgical rates were based, are rough estimates, yet the best currently available. Estimates of needs for surgery are more accurate for caesarean section than for hernia; this is mainly due to relatively reliable data on deliveries and maternal and child health; local studies of the prevalence of hernia and figures for the incidence of strangulated hernia do not exist.

Informed estimates based on the best information available led to the following conclusions: of an estimated need for 175 inguinal hernia repairs per 100 000 population per year, only 25 are carried out and 150 left undone; of 30 needed operations for strangulated hernia, only four are carried out whereas 26 are not; and, of 225 caesarean sections needed per 100 000 per year, only 25 are carried out whereas 200 are not. This implies that numerous obstetric disasters occur in remote rural villages and that many vesicovaginal fistulas, conditions of disability due to cerebral trauma at birth, and other complications are associated with this unmet need for surgery. Most of the new cases of inguinal hernia appearing every year do not undergo surgery, instead entering the large pool of accumulated cases risking strangulation, which, if it occurs, is generally fatal because it is not operated on in time.

There is a consumer demand for only part of the need for surgery identified above. This is due to a number of factors including cultural obstacles, ignorance regarding the likely benefits of surgery, inaccessibility of services, and dissatisfaction with the kind of modern health care offered by many hospitals in Africa. Continuing modernisation, including improved basic education and a more satisfactory performance of the health care system, is expected slowly to increase the demand for major surgery as well as other forms of modern health care.

Most premature deaths in rural Africa are due to infections, often made more severe by malnutrition, but conditions requiring major surgery appear to be overlooked as prominent killers. They need more attention, particularly as their management requires a different technology and organisational structure than most non-surgical conditions. Moreover, the reputation and the credibility of modern health care in rural Africa, and hence its future development, depend largely on its ability to manage severe surgical conditions directly or through referral. This means, in most cases, that much needed improvements in primary care must be combined with upgrading of secondary care.

References

1 Vayda E. A comparison of surgical rates in Canada and in England and Wales. *N Engl J Med* 1973;**289**:1224-9.
2 Rutkow IM, Zyidema GD. Surgical rates in the United States: 1966 to 1978. *Surgery* 1981;**89**:151-62.
3 Netherland's Central Bureau of Statistics. *Geopereerde ziekenhuispatienten naar ard van de operatie, leeftijd en geslacht in het jaar 1979*. Voorburg, The Netherlands: Central Bureau voor de Statistiek, 1979.
4 Bunker JP. Surgical manpower. A comparison of operations and surgeons in the United States, and in England and Wales. *N Engl J Med* 1970;**282**:135-44.
5 National Board of Health and Welfare. *Inpatient statistics from hospitals in the Uppsala region 1975-1977*. Stockholm, National Central Bureau of Statistics, 1980. (HS 1980:21·1).
6 McPherson K, Strong PM, Epstein A, Jones L. Regional variations in the use of common surgical procedures: within and between England and Wales, Canada, and the USA. *Soc Sci Med* 1981;**15A**:273-88.
7 Wood AM. The epidemiology of surgical disease in rural hospitals. In: *Proceedings of symposium on supplying the surgical needs of developing countries*. XIXth annual meeting of the International Federation of Surgical Colleges in Dallas, Texas, USA, 1977.
8 Aggarwal VP. Obstetric emergency referrals to Kenyatta National Hospital. *East Afr Med J* 1980;**57**:144-9.
9 Malone MI. The quality of care in an ante-natal clinic in Kenya. *East Afr Med J* 1980;**57**:86-96.
10 Klufio CA, Ardrayfio SAW, Nartey IN, Kissi SAY. A retrospective survey of caesarean sections at Korle Bu Teaching Hospital, Accra: 1971—a review of 1077 cases. *Ghana Medical Journal* 1973;**12**:142-50.
11 Lawson J. The place of caesarean section in developing countries. *Trop Doct* 1972;**2**:30-2.
12 Belcher DW, Nyane PK, Wurapa FK. The prevalence of inguinal hernia in adult Ghanaian males. *Trop Geogr Med* 1978;**30**:39-43.
13 Evans PAS. Health survey in 300 African males. *Cent Afr J Med* 1961;**7**:55.
14 Roy AD. Surgical care in the village. *Proc R Soc Lond* 1980;**209**:147-51.
15 McAdam IWJ. A three-year review of intestinal obstruction, Mulago Hospital, Kampala, Uganda, 1958-1960. *East Afr Med J* 1961;**38**:536-43.
16 Burkitt DP. Acute abdomens—British and Baganda compared. *East Afr Med J* 1952;**29**:189-94.
17 Roy AD. How can a country improve its rural surgery ? In: *Proceedings of symposium on supplying the surgical needs of developing countries*. XIXth annual meeting of the International Federation of Surgical Colleges in Dallas, Texas, USA, 1977.
18 Momoh JT. Incarcerated and strangulated inguinal hernias in infants and children. *East Afr Med J* 1980;**57**:340-5.

(*Accepted 11 April 1984*)

Clinical curio: phantom finger

A sailor accidentally cut off his right index finger. For 40 years afterwards he was plagued by an intrusive phantom of the finger rigidly extended, as it was when cut off. Whenever he moved his hand towards his face—for example, to eat or to scratch his nose—he was afraid that this phantom finger would poke his eye out. (He knew this to be impossible, but the feeling was irresistible.) He then developed severe sensory diabetic neuropathy and lost all sensation of even having any fingers. The phantom finger disappeared too.

It is well known that a central pathological disorder, such as a sensory stroke, can "cure" a phantom. How often does a peripheral pathological disorder have the same effect?—OLIVER W SACKS, professor of neurology, New York.