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External Herniae in Accra—Some Epidemiological Aspects

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Summary. A 2-year prospective study of patients reporting with external herniae in Korle Bu Teaching Hospital, Accra, has shown that in this area inguinal hernia constituted about 92%, femoral hernia about 2%, infantile umbilical hernia and para-umbilical hernia about 4%, epigastric hernia and incisional hernia 1% each.

In the female inguinal hernia comprised about 41%, infantile umbilical and para-umbilical hernia together 27%, epigastric hernia 11%, incisional hernia about 12% and femoral hernia about 9%.

In the male, inguinal hernia comprised about 96%, femoral hernia about 1%, infantile umbilical 1·5% and para-umbilical epigastric and incisional hernia 1%.

Although the relative proportion of inguinal hernia is subtantially the same as in British and American communities, that of femoral hernia is much lower, and that of infantile umbilical and para-umbilical hernia higher especially in women.

Résumé. Une étude prospective de deux ans, portant sur des malades vus au 'Korle Bu Teaching Hospital', Accra, et qui presentaient des hernies externes, a permis de constater que les 92% avaient des hernies inguinales, 2% des hernies femorales, 4% étaient constitues de hernies ombilicales et para-ombilicales de l'enfant, et le reste étant composé de 1% de hernies epigastriques et 1% de hernies d'incision.

Chez les femmes, 41% presentaient des hernies inguinales, 27% des hernies ombilicales et para-ombilicales de l'enfant, le reste étant composé de 11% de hernies epigastriques, 12% de hernies d'incision, et 9% de hernies femorales.

Toutefois parmi les hommes, les 96% des cas étaient constituès de hernies inguinales, 1% de hernies femorales, 1,5% de hernies ombilicales de l'enfant, et 1% de hernies para-ombilicales, epigastriques d'incision.

On a également constaté que le nombre de hernie inguinale est proportionnellement egal au nombre des cas observes parmiles Britanniques et les Americains; toutefois les cas de hernie femorales sont beaucoup plus reduits alors que ceux de hernie ombilicales et para-ombilicale de l'enfant sont relativement plus élevés, surtout chez lez femmes.

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TABLE 1. Sex/age/site, distribution of 1270 external herniae diagnosed at Korle Bu Teaching Hospital, Accra, 1969/70

	0–4		5–9		10–14		15–19		20–29		30–39		40–49		50–59		60–69		70+		Total		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Inguinal	77	4	28	3	19	—	65	3	351	12	229	8	148	4	101	5	76	3	30	—	1124	42	1166
Femoral	—	—	—	—	—	—	—	—	2	—	4	3	3	2	3	2	2	2	—	—	14	9	23
Umbilical	7	2	4	1	1	2	—	—	2	1	2	1	—	3	1	—	—	2	1	1	18	13	31
Paraumbilical	—	—	—	—	—	—	—	1	—	3	2	5	2	1	1	2	1	2	—	1	6	15	21
Epigastric	—	—	—	—	—	—	—	—	1	—	1	3	—	2	—	3	1	3	—	—	3	11	14
Incisional	—	—	—	—	—	—	—	1	—	2	—	2	1	3	1	2	—	—	—	2	2	2	14
Lumbar	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	1
Total	84	6	32	4	20	2	65	5	356	18	238	22	154	15	107	15	80	12	31	4	1167	103	1270

In Accra, Ghana, strangulated external hernia is a common surgical emergency and the most important cause of intestinal obstruction, accounting for 77% of all such cases (Badoe, 1970). Cold external hernia is the commonest surgical condition as in other countries, and in 1969/70, 969 cold herniorrhaphies were done in Korle Bu Teaching Hospital, Accra. However, from the published data on strangulated external hernia (Badoe, 1965, 1970; Cole, 1965; McAdam, 1961) and also from impressions, it is apparent that the relative incidence of the various types of external hernia in tropical Africa is different from the experience in European and North American communities. A study of external herniae was therefore undertaken in Korle Bu Teaching Hospital, Accra.

MATERIALS AND METHODS

A prospective study was made of all new patients reporting with external hernia in the 2-year period from 1 February 1969 to 31 January 1971. After the consulting surgeon had examined the patient and established the diagnosis, a staff nurse filled in a simple form giving details about the hernia.

TABLE 2. Site distribution of 1270 external herniae diagnosed in Korle Bu Teaching Hospital 1969/70

	Both sexes		Male		Female	
Type	No.	Percentage	No.	Percentage	No.	Percentage
Inguinal	1166	91·8	1124	96·5	42	40·8
Femoral	23	1·8	14	1·2	9	8·7
Umbilical	31	2·4	18	1·5	13	12·6
Paraumbilical	21	1·8	6	0·8	15	14·5
Epigastric	14	1·1	3		11	10·7
Incisional	14	1·1	2		12	11·7
Lumbar	1				1	
Total	1270	100	1167	100	103	100

RESULTS

There were 1188 patients, 1100 males and eighty-eight females, with 1270 herniae. The details of the herniae are shown in Tables 1–4.

Distribution of the various types of external herniae (Table 2)

(i) *Both sexes.* There were 1166 inguinal herniae constituting 91·8% of all external herniae, twenty-three femoral herniae, i.e. 1·8%, thirty-one infantile umbilical herniae, i.e. 2·4%, twenty-one para-umbilical herniae, i.e. 1·8%, fourteen each of epigastric hernia and incisional hernia, i.e. 1·1% and one lumbar hernia.

(ii) *In the male.* In the male, inguinal hernia comprised 96·5%, femoral hernia 1·2%, infantile umbilical hernia 1·5% and para-umbilical, epigastric and incisional herniae together 0·8%.

(iii) *In the female.* In the female, inguinal hernia accounted for 40·8%, femoral 8·7%, infantile umbilical 12·6%, para-umbilical 14·5%, epigastric 10·7% and incisional hernia 11·7%. There was one case of lumbar hernia.

Sex distribution

External hernia is much commoner in the male, there being 1167, i.e. 92% in males to 103, i.e. 8% in females. Inguinal hernia is by far the commonest hernia in both sexes.

Age distribution (Table 3)

The highest incidence was in the third decade, 29·5% followed by the fourth with 20·5% and the fifth with 13·3%. The incidence was low in the age group 5–14, 4·5%. It is thus the men in the economically important age groups who are most plagued by this malady.

Inguinal hernia

There were 1098 patients, 1062 males and thirty-six females, with inguinal hernia. 682 were on the right, 348 on the left, and in sixty-eight the hernia was bilateral. There were thus 1166 herniae with a right/left/bilateral ratio of 10:5:1. 1124 of the herniae were in the male and forty-two in the female, so that 96·4% of all inguinal herniae are in the male and 3·6% in the female. 1102 herniae (1064 males and thirty-eight females) were indirect and sixty-four (sixty males and four females) were direct. 726 indirect herniae in the male were on the right and 395 on the left, giving a RIIH/LIIH ratio of 1·84:1.

TABLE 3. Age distribution of 1270 external herniae diagnosed in Korle Bu Teaching Hospital 1969/70

Age group	Number	Percentage
0–4	90	7·1
5–9	36	2·8
10–14	22	1·7
15–19	70	5·5
20–29	374	29·5
30–39	260	20·5
40–49	169	13·3
50–59	122	9·6
60–69	92	7·2
70+	35	2·8
Total	1270	100·0

Of the sixty direct herniae twenty-nine were on the right and thirty-one were on the left, giving a RDIH/LDIH of 1:1. In the female there were twenty-one inguinal herniae on each side, a right/left ratio of 1:1. Three of the patients with direct hernia were in the third decade and the rest were over 30. 543 indirect herniae were over 30. Thus, over the age of 30, 89% of inguinal herniae are indirect and 11% are direct.

688 herniae (650 male and thirty-eight females), i.e. 58% were incomplete and 478 (474 male and four female), i.e. 42% were complete. It is of interest that a 30-year-old male had a complete hernia which was shown at operation to be direct in type.

Femoral hernia

Only twenty-three cases were seen in the 2-year period, accounting for only 1·2% of the

series. It is thus an uncommon hernia in this area. Fourteen were males and nine were females, showing a slight male preponderance. All the patients, except two, were over 30.

Infantile umbilical hernia

Of thirty-one cases of infantile umbilical hernia, eighteen were males and thirteen were females, and although nine presented before the age of fifteen there was a fair distribution in all age groups.

Para-umbilical and epigastric herniae

Twenty-one cases of para-umbilical and fourteen of epigastric herniae comprised 1·8 and 1·1% of the series respectively, and a male/female ratio of 1:2·5 and 1:4. One female was 19, three females and one male were in the third decade and the rest were over 30.

Other external herniae

Of the fourteen cases of incisional hernia, twelve were women, and the operations were mostly caesarean sections through median subumbilical incision. The rare lumbar hernia was seen in a woman aged 55.

DISCUSSION

Inguinal hernia accounted for nearly 92% of all external herniae, 96·5% of herniae in the male and nearly 41% of herniae in the female in this area. Sir Arthur Keith (1924) calculated that inguinal hernia constituted 90% of all herniae, 97% of herniae in the male, and 50% of herniae in the female in Britain. According to Watson (1948) in America, inguinal hernia comprises 95% of all herniae in males and 45% in females. The relative proportion of inguinal hernia in the Ghanaian, British and North American communities is therefore not dissimilar. 96·4% were in the male and 3·6% in the female, a male/female ratio of 27:1. Murley (1966) states that 98% of inguinal herniae are in the male and 2% in the female. It would thus appear that the female proportion is slightly higher in this region than in Britain.

Over the age of 30, 11% of inguinal herniae were direct in type. Bowesman (1960) was of the opinion however, that in the adult male, 25% of inguinal herniae were direct. Ashley (1954) found that 42% of all inguinal herniae he personally treated in Mulago Hospital, Uganda were direct. Maingot (1969) implies by his figures that 20% of inguinal herniae are direct. While it must be pointed out that not all the diagnoses were confirmed by operation, with the much younger population in this region it is only to be expected that the relative proportion of direct hernia should be lower than in the much older European communities. Four (9·4%) of the forty-two inguinal herniae in women were direct, a finding similar to the experience of Murley (1966) in Britain who in a personal series found that approximately 10% of female inguinal herniae were direct in type.

It is of interest that while in the male the ratio of RIH/LIH was 1·84:1, in the female it was 1:1. Bowesman (1960) noted that inguinal hernia was twice as common on the right as on the left, and Murley (1966) also observed that in the male inguinal hernia was appreciably more common on the right. There was not much difference in the number of direct inguinal hernia on the two sides. These observations indirectly support the congenital origin of indirect inguinal hernia in the male as the later descent of the right testis is more likely to leave a patent processus vaginalis.

In the male, 58% of inguinal herniae were incomplete and 42% complete, suggesting that our patients have their hernia for a long period before reporting for surgery. In the female, four, i.e. 9·4% of the herniae were complete.

TABLE 4. Sex/age/site distribution of 1166 inguinal herniae diagnosed in Korle Bu Teaching Hospital, Accra, 1969/70

	Age group																				
	0–4		5–9		10–14		15–19		20–29		30–39		40–49		50–59		60–69		70+		Total		Total
Site	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Right	43	1	15	1	12	—	45	2	223	5	130	3	94	2	55	1	35	—	15	—	667	15	682
Left	28	3	13	2	7	—	16	1	100	3	79	3	34	2	28	—	23	1	7	—	333	15	348
Bilateral	3	—	—	—	—	—	2	—	14	2	10	1	11	—	9	2	9	1	4	—	62	6	68
Type																							
Indirect	77	4	28	3	19	—	65	3	348	12	214	7	131	1	92	5	65	3	15	—	1067	38	1102
Direct	—	—	—	—	—	—	—	—	3	—	15	1	17	3	9	—	11	—	5	—	57	4	64
Incomplete	61	4	17	3	13	—	41	3	213	9	128	7	70	4	44	5	48	3	15	—	650	38	688
Complete	16	—	11	—	6	—	24	—	138	3	101	1	78	—	57	—	28	—	15	—	474	4	478

Femoral herniae constituted only 1·8% of the entire series, 1·2% in the male series and 8·7% in the female series. In the U.S.A., femoral hernia constitutes 6% of all herniae according to Harkins (1964) and 5–7% according to Shackleford (1968). Shackleford further adds that femoral hernia comprises 32% of all herniae in the female and 2% in the male. Murley (166) in Britain states that 'femoral herniae comprise 5% of all herniae and they are much more common in women than in men though in both sexes femoral hernia is less common than inguinal. About 30% of all herniae in women but only 2% in men are in the femoral position.' Sir Arthur Keith (1924) also states that femoral hernia constitutes 7% of all herniae, 2% of male herniae and 34% of female herniae. Maingot (1969) writing for European and North American communities also gives the relative incidence of femoral hernia as 4%. A general hospital in Britain serving some 200,000 people showed an annual average for 3 years of sixty-five femoral herniae treated by operation including twenty for strangulation (*Lancet*, 1962). But Korle Bu Hospital, Accra, serving a population of over 600,000 has shown an annual average for 2 years of only thirteen femoral herniorrhaphies including five for strangulation. It would appear therefore that the relative incidence of femoral hernia is much lower in the Ghanaian than in the European, and due mainly to the markedly low incidence in the female. While the male/female ratio in Britain according to Aird (1957) is 1:6 and in the U.S. 1:3 (McVay, 1968), in Accra it is 1·6:1 from the present series, although in two series of intestinal obstruction the male/female ratio of strangulated femoral hernia was nearly 1:2 (Badoe, 1965, 1970). Since Ghanaian women are usually more parous than their European sisters and no less obese, increased intra-abdominal pressure cannot be the main cause in the etiology of femoral hernia in this area. Davey (1968) in a dissection of twenty cadavers in Nigeria found that in every case the lower end of the femoral canal was occluded by an enlarged gland resulting from chronic leg ulcers and foot sepsis If this is the cause of the low incidence in Africans generally, then as Ghanaians take to footwear at an early age, the incidence of femoral hernia should increase. It has been suggested that femoral hernia is more likely to occur in people in whom the insertion of the conjoined tendon is to a narrow area around the pubic tubercle and not to the entire pectineal ligament (*Lancet*, 1962). Does it follow that very few Ghanaians have this abnormal insertion of the conjoined tendon? The age old hypothesis that femoral hernia is more common in women because of their bigger pelvis and smaller femoral vessels is now disputed (*Lancet*, 1962). But the fact that android pelvis in the female is believed to be more common in this region and the lack of any marked difference in distribution between the two sexes suggest that such an etiology may be partly responsible in this region.

A relative incidence of 1·1% of epigastric hernia in this region is similar to the experience of Murley (1966) in Britain. However, it was much more common in females (F/M—4:1) contrary to the view of Murley. Again with one exception, all the patients were between 30 and 70. Most epigastric herniae encountered had a definite peritoneal sac and were not just protrusions of extraperitoneal fat through the linea alba as appears to be the experience elsewhere (Murley, 1966). Increase in intraperitoneal pressure especially in the multiporous female must be a factor here.

Infantile umbilical hernia which is supposed to be more common in the negro infant (Murley, 1966) constituted 2·4% of all herniae and was slightly more common in the male. It was seen at all ages but most commonly in the first decade, and the older patients admitted to having it from infancy. With the spread of midwifery services in the country and the proper care of the umbilicus, the incidence should diminish. Para-umbilical hernia on the

other hand was much more common in the female and in the older age groups due, as elsewhere, to multiple pregnancies and obesity. Infantile umbilical and para-umbilical hernia together formed 4·2% of all herniae, 27% of female herniae, and about 2% of male herniae. This compares with 3% of all herniae, 16% of female herniae and 1% of male herniae in Britain (Keith, 1924). This type of hernia is therefore relatively more common in this area than in Britain especially in women. Incisional hernia formed 10·7% of female herniae but 1·1% of the entire series. As the health services improve and more laparotomies are done, incisional hernia is bound to increase unless scrupulous techniques are employed and sepsis prevented.

Though the relative proportions of the various types of external herniae has been determined and those of inguinal and epigastric herniae found to be substantially the same as in Britain or America, that of femoral hernia lower and that of infantile umbilical and para-umbilical higher, a survey of at least a sample of the population is necessary to determine the true incidence of the various herniae before firm conclusions can be drawn.

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