The Epidemiology of hernias in Tamale, Northern Ghana

Abstract

AIM: The aim of this study was to determine the incidence and the associated demographic characteristics of hernia cases seen at the Tania Specialist Hospital in Tamale, Northern Ghana.

Methodology: This retrospective study was conducted from January 2008 to December 2012 at the Tania Specialist Hospital. All patients admitted into the Tania Specialist Hospital for the repair of any type of hernia were included into the study.

Results: Out of the 1330 hernia patients, 92.9% were males (n=1236) and 90.7% (n=1206) were aged 21-40 years. The highest type of hernia recorded during the period under review were inguinal hernia (29.7%, n=395), incisional hernia (27.1%, n=350), recurrent hernia (20.1%, n=260) and epigastric hernia (20.9%, n=270). The highest incidence of all the types of hernia was recorded in 2011 and 2012. In all types of hernia, over 80% of the patients were aged 21-40 years. The incidence of hernia was 13 times higher in males than in females. Those patients aged 21-40 years had the highest incidence of all types of hernia seen.

Introduction

The repair of hernia especially inguinal hernia is the oldest and commonest operation performed by general surgeons all over the world [1-2]. Based on few documented studies, 7.7% of the adult male population in Southern Ghana has hernia while in Tanzania (East Africa) the prevalence ranges from 16% to over 30% on the island of Pemba [3-5].

Inguinal hernia is the commonest type of hernia in African countries. In a study of the epidemiology of hernias in Kumasi, Southern Ghana, West Africa, Ohene-Yeboah and colleagues [2] found that over 70% of all recorded hernias were inguinal.

Over 50% of all hernia cases reported to healthcare institutions may be untreated in African countries due to lack of adequate and affordable surgical care [3, 6-8]. Repair rates of hernia have been estimated to be 56, 21 and 18 per 100, 000 in Northern Ghana, Uganda and Malawi respectively [3, 7-8]. Most of these repairs are performed as emergency surgeries. Elective surgeries are not an option due to lack of income to cover the cost of surgery, and inaccessibility to appropriately equipped healthcare facilities [9-

10]. Hernias are therefore left untreated resulting in high morbidity and mortality rates [2, 9, 11].

Reports on the incidence and prevalence of hernia in Africa are scarce, more so in Northern Ghana. The purpose of this study was to determine the incidence of hernias seen at the Tania Specialist Hospital in Tamale, Northern Ghana. In addition we assessed the associated demographic characteristics of the hernia.

Methods and Patients

This retrospective study was conducted from January 2008 to December 2012 at the Tania Specialist Hospital. All patients admitted into the Tania Specialist Hospital for the repair of any type of hernia were included into the study. With the aid of a designed pro-forma, all data including sex and age were extracted from the medical records of the patients who had their hernias repaired.

Statistical analysis

All data was analysed using GraphPad Prism version 5.00 (GraphPad software, San DiegoCalifornia USA, www.graphpad.com) for windows. The results are presented as frequencies and proportions and compared using Fisher's exact test or $\chi 2$ for trend analysis as appropriate. A level of $p<0.05$ was considered as statistically significant.

Results

Presented in table 1 are the general characteristics of the patients. Out of the 1330 patients, 92.9% were males (n=1236) and 90.7% (n=1206) were aged 21-40 years. The highest incidence of all types of hernia rose from 5.1% (n=60) in 2008 to 32.1% (n=375) in 2012. The highest incidence of a particular type of hernia recorded during the period under review were inguinal hernia (29.7%, n=395), incisional hernia (27.1%, n=350), recurrent hernia (20.1%, n=260) and epigastric hernia (20.9%, n=270). Among those with inguinal hernia, the most common was indirect inguinal hernia accounting for 84.7% (n=332) of all cases.

Table 1: General characteristics of the patients

Variable	No. of patients	%
Sex		
Male	1236	92.9
Female	94	7.1
Age (years)		
1-20	47	3.5
21-40	1206	90.7
41-60	74	5.6
61+	3	0.2
Types of hernia		
Inguinal hernia	395	29.7
Femoral hernia	20	1.6
Recurrent hernia	260	20.1
Incisional hernia	350	27.1
Umbilical hernia	35	2.7
Epigastric hernia	270	20.9
Others	0	0.0

The incidence of the different types of hernia recorded annually during the period under review is presented in table 2. Generally all the types of hernia increased annually during the study period. Significantly indirect inguinal hernia, incisional hernia and epigastric hernia increased annually. Generally, in all types of hernia, the highest numbers were recorded in 2011 and 2012, during which time the National Health Insurance Scheme was introduced into the Tania Specialist Hospital. This might have accounted for the increase in the number of cases recorded during that period.

Table 2: Annual incidence of the different types of hernia from 2008 – 2012

Type of hernia	Year under review					P value
	2008	2009	2010	2011	2012	
Indirect inguinal hernia (n=395)	50(12.6%)	50(12.6%)	50(12.6%)	119(30.1%)	126(31.1%)	0.085
Femoral hernia (n=20)	1(5.0%)	2(10.0%)	4(20.0%)	7(35.0%)	6(30.0%)	0.668
Recurrent hernia (n=260)	10(3.8%)	35(13.5%)	65(25.0%)	80(30.8%)	70(26.9%)	0.909
Incisional hernia (n=350)	12(3.4%)	8(2.3%)	30(8.6%)	125(35.7%)	175(50.0%)	<0.001
Umbilical hernia (n=35)	5(14.3%)	7(20.0%)	5(14.3%)	9(25.7%)	9(25.7%)	0.116
Epigastric hernia (n=270)	45(16.7%)	55(20.4%)	55(20.4%)	70(25.9%)	45(16.7%)	<0.001
Others	0	0	0	0	0	

Shown in table 3 is the incidence of the different types of hernia according to age category. In all types of hernia, 80-100% of the patients were aged 21-40 years.

Table 3: The incidence of hernia stratified by type of hernia

	Age category				
Type of hernia	**1-20**	**21-40**	**41-60**	**61 +**	**P value**
Indirect inguinal hernia	20(6.0%)	272(81.9%)	40(12.5%)	0(0.0%)	<0.0001
Direct inguinal hernia	0(0.0)	63(100.0%)	0(0.0%)	0(0.0%)	N.A
Femoral hernia	0(0.0%)	20(100.0%)	0(0.0%)	0(0.0%)	N.A
Recurrent hernia	11(4.2%)	216(83.1%)	30(11.5%)	3(1.2%)	0.9092
Incisional hernia	10(2.9%)	337(96.3%)	3(0.9%)	0(0.0%)	0.9943
Umbilical hernia	3(8.6%)	32(91.4%)	0(0.0%)	0(0.0%)	N.A
Epigastric hernia	3(1.1%)	266(98.5%)	1(0.4%)	0(0.0%)	0.9865

N.A = not applicable

Discussion

Hernias especially inguinal hernias are prevalent in developing countries including Ghana. In this study we described the incidence of the different types of hernia seen at Tania Specialist Hospital.

The incidence of all types of hernia was higher in males compared to females resulting in a male to female ratio of 13:1. This is similar to several studies conducted in developing countries [1-2, 12].

Over 90% of all types of hernia were found in those patients aged 21-40 years of age. In agreement with our findings, Ohene-Yeboah and his colleagues [2] in a report on the epidemiology of 2000 external hernia cases seen in Southern Ghana found that 1 in 5 of inguinal hernia occurred in boys aged four or less, fewer inguinal hernias were seen in patients aged 5 to 15 years, and the numbers of inguinal hernia increased sharply after the age of 20 years. The high incidence of hernia in the patients aged 21-40 years could be due to the fact that they represent the active economic labour force of the Ghanaian population. Given the high poverty level of the Northern region of Ghana, a large proportion of these patients (over 60%) are engaged in either farming and/or any other agricultural or laborious activity to make a living [2], increasing their risk of developing hernia. Adesunkanmi and colleagues [12] in a retrospective study of the clinical features of inguinal hernia in 425 adult patients in Ile Ife in southwestern Nigeria and the surrounding urban and semi-urban communities reported that over 60% of the patients were either farmers or people engaged in some agricultural activity in addition to whatever they did for a living.

Generally, the most common type of hernia recorded was inguinal hernia (both direct and indirect). Over 80% of which were indirect. This is consistent with studies from other parts of Ghana [2-5, 13]. The high incidence of indirect inguinal hernia in this study could be due to neglected childhood congenital and acquired inguinal hernias that had been carried on to adulthood [10, 12]. The reasons for neglect of the hernia could be as a result several factors including availability of few well-resourced health facilities, high poverty state of indigenes, bad and inaccessible roads to health facilities, ingnorance of the people about health matters and the general lack of competent, skilled staff. Furthermore, the complete absence of paediatric surgeons and the recently brought in few young general surgeons have also contributed to the neglect of hernias till adulthood.

Over 20% of all the cases seen in this study were recurrent. The relatively high incidence of recurrent hernia in this study may be attributed to the fact that the most commonly used hernia repair technique in Ghana is the Bassini, which has a high incidence of recurrence [14-16]. Several published research has indicated that the Bassini technique is the most commonly used inguinal hernia repair technique in Africa [12, 17-19]. Even though, it is no longer used in the developed countries, it remains the standard in Africa [12, 19-21]. In addition, over 90% of hernia cases are repaired by general medical officers and under emergency conditions. Many hospitals have a one general medical officer stationed, who attends to all major cases (e.g. OPD, medical emergencies, obstetrics and gynae as well as surgical, trauma and orthopaedic emergencies). Inferior, inappropriate and cheaper suturing materials are often used in the repair of the hernia. These reasons may also contribute to the high incidence recurrent hernias

Incisional hernia had the second highest incidence in this study. This is in agreement with the findings of Ohene-Yeboah and Colleagues [2] in which incisional hernia was recorded as the second most common hernia type in a study conducted in Kumasi, Southern Ghana. Poor nutritional status in addition to the reasons identified for the high incidence of the recurrent hernia may account for the high incidence of incisional hernia.

There was a gradual annual increase in the incidence of hernia from 2008 to 2010. The incidence rose sharply in all types of hernia, almost twice the previous year's incidence in some types of hernia in 2011 and 2012. The peak increment in the incidence rates in 2011 and 2012 could be attributed to the accreditation of the Tania Specialist Hospital by the National Health Insurance Authority for the payment of healthcare services provided to beneficiaries of a National Health Insurance Scheme (NHIS). The NHIS covers over 95% of all disease conditions in Ghana including hernia. It was introduced in 2003 and reviewed in 2004 [22], with the mission to provide financial risk protection against the cost of quality basic health care for all residents in Ghana [23]. One of the barriers to seeking care for surgical repair of hernias by patients in Ghana and more so in the Northern part is poverty, which makes it unable for patients to pay for the cost of surgery upfront. The introduction of NHIS and the subsequent accreditation of the Tania Specialist hospital granted registered NHIS patients the opportunity to seek healthcare services from the healthcare provider without paying any money instantly. In agreement with several studies in Ghana [2] and other African countries [21], most of the hernia repairs were emergency surgeries. This is in contrast to those reported from developed countries in which only 1–3% of hernias are done under emergency conditions [3, 13, 24-25]. Several factors contribute to this situation including the

inability to pay for the cost of surgery and inaccessibility/unavailability of health care facilities especially in rural areas [9].

Conclusion

The incidence and types of hernia recorded in this study are similar to those recorded in the Southern part of Ghana. The incidence of hernia was 13 times higher in males than in females. Those patients aged 21-40 years had the highest incidence of all the types of hernia seen. Inguinal hernia was the most common type of hernia found in this study.

References

1. Aytac B, Cakar K, Karamercan A: **Comparison of Shouldice and Lichtenstein repair for treatment of primary inguinal hernia**. *Acta chirurgica Belgica* 2004(4):418-421.
2. Ohene-Yeboah M, Abantanga F, Oppong J, Togbe B, Nimako B, Amoah M, Azorliade R: **Some aspects of the epidemiology of external hernias in Kumasi, Ghana**. *Hernia* 2009, **13**(5):529-532.
3. Wilhelm T, Anemana S, Kyamanywa P, Rennie J, Post S, Freudenberg S: **Anaesthesia for elective inguinal hernia repair in rural Ghana-appeal for local anaesthesia in resource-poor countries**. *Tropical doctor* 2006, **36**(3).
4. Belcher D, Nyame P, Wurapa F: **The prevalence of inguinal hernia in adult Ghanaian males**. *Tropical and geographical medicine* 1978, **30**(1):39-43.
5. Yordanov Y, Stoyanov S: **The incidence of hernia on the island of Pemba**. *East African medical journal* 1969, **46**(12):687-691.
6. Yang J, Papandria D, Rhee D, Perry H, Abdullah F: **Low-cost mesh for inguinal hernia repair in resource-limited settings**. *Hernia* 2011, **15**(5):485-489.
7. Lavy C, Tindall A, Steinlechner C, Mkandawire N, Chimangeni S: **Surgery in Malawi–a national survey of activity in rural and urban hospitals**. *Annals of the Royal College of Surgeons of England* 2007, **89**(7):722.
8. Ozgediz D, Galukande M, Mabweijano J, Kijjambu S, Mijumbi C, Dubowitz G, Kaggwa S, Luboga S: **The neglect of the global surgical workforce: experience and evidence from Uganda**. *World journal of surgery* 2008, **32**(6):1208-1215.
9. McConkey SJ: **Case series of acute abdominal surgery in rural Sierra Leone**. *World journal of surgery* 2002, **26**(4):509-513.

10. Ohene-Yeboah M, Abantanga F: **Inguinal hernia disease in Africa: a common but neglected surgical condition**. *West African journal of medicine* 2011, **30**(2):77-83.
11. Harouna Y, Yaya H, Abdou I, Bazira L: **[Prognosis of strangulated inguinal hernia in the adult: influence of intestinal necrosis. Apropos of 34 cases]**. *Bulletin de la Societe de pathologie exotique (1990)* 2000, **93**(5):317-320.
12. Adesunkanmi ARK, Badmus TA, Ogundoyin O: **Determinants of outcome of inguinal herniorrhaphy in Nigerian patients**. *Annals of the College of Surgeons of Hong Kong* 2004, **8**(1):14-21.
13. Nordberg EM: **Incidence and estimated need of caesarean section, inguinal hernia repair, and operation for strangulated hernia in rural Africa**. *British medical journal (Clinical research ed)* 1984, **289**(6437):92.
14. Amato B, Moja L, Panico S, Persico G, Rispoli C, Rocco N, Moschetti I: **Shouldice technique versus other open techniques for inguinal hernia repair**. *Cochrane Database Syst Rev* 2012, **4**.
15. Beets GL, Oosterhuis KJ, Go PM, Baeten CG, Kootstra G: **Longterm followup (12–15 years) of a randomized controlled trial comparing Bassini-Stetten, Shouldice, and high ligation with narrowing of the internal ring for primary inguinal hernia repair**. *Journal of the American College of Surgeons* 1997, **185**(4):352-357.
16. Just E, Botet X, Martinez S, Escolà D, Moreno I, Duque E: **Reduction of the complication rate in Liechtenstein hernia repair**. *International Journal of Surgery* 2010, **8**(6):462-465.
17. Ramyil V, Iya D, Ogbonna B, Dakum N: **Safety of daycare hernia repair in Jos, Nigeria**. *East African medical journal* 2000, **77**(6).
18. Adesunkanmi A, Agbakwuru E, Badmus T: **Obstructed abdominal hernia at the Wesley Guild Hospital, Nigeria**. *East African medical journal* 2000, **77**(1).
19. Odula PO, Kakande I: **Groin Hernia in Mulago hospital, Kampala**. 2007.
20. Archampong E: **Surgery in developing nations**. *British journal of surgery* 2006, **93**(5):516-517.
21. Adesunkanmi A, Badmos T, Salako A: **Groin hernias in patients 50 years of age and above pattern and outcome of management in 250 consecutive patients**. *West African journal of medicine* 1999, **19**(2):142-147.
22. Health Mo: **National Health Insurance Policy Framework for Ghana**. In. Edited by Health Mo; 2004.
23. **National Health Insurance Authority: National Health Insurance Scheme. 2003. Retrieved from http://www.nhis.gov.gh/nhia.aspx**
24. Sanders D, Porter C, Mitchell KD, Kingsnorth A: **A prospective cohort study comparing the African and European hernia**. *Hernia* 2008, **12**(5):527-529.

25. Abramson J, Gofin J, Hopp C, Makler A, Epstein L: **The epidemiology of inguinal hernia. A survey in western Jerusalem**. *Journal of epidemiology and community health* 1978, **32**(1):59-67.