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, 80-100% of the patients were aged 21-40 years. The incidence of hernias was 13 times higher in males than in females. Those aged 21-40 years had the highest incidence of all the types of hernia seen.

Introduction

The repair of hernias 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 hernias 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. In Tanzania, East Africa, Yardanow and Stoynov [5] determined that 16% to over 30% of the population has inguinal hernia. Another study in Ghana, estimated the prevalence of inguinal hernia to be 7.7% of the population [4].

Over 50% of all hernia cases reported in healthcare institutions may be untreated in African countries that lack adequate and affordable surgical care [3, 6-8]. Repair rates of hernias 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 hernias.

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 abstracted from the medical records of the patients who had hernia repair.

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 incidence of all types of hernia rose from 5.1% (n=60) in 2008 to 32.1% (n=375) in 2012. 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). Among those with inguinal hernia, the most common was indirect inguinal hernia occurring in 84.7% (n=332) of all inguinal hernias.

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
Unbilical 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 direct 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 in the Tania Specialist Hospital. This might have contributed to 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
Unbilical 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 2 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 hernias seen at the 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 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 hernias in Ghana found that 1 in 5 of inguinal hernias occurred in boys aged four years or less, fewer inguinal hernias were seen in ages 5 to 15 years, and the numbers of inguinal hernia increased sharply after the age 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%) engage 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 hernias 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 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 inguinal hernias that had been carried on to adulthood [10, 12]. The neglect of the hernia could be as a result of several factors including poor access to health facilities, poverty, and inaccessible roads to health facilities, ignorance, and lack of competent staff among others.

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.

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 mostly 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].

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 type of hernias 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 the surgical repair of hernias in Ghana and more so in the Northern part is poverty, which makes it unable for patients to pay for the cost of surgery. The introduction of NHIS and the subsequent accreditation of the Tania Specialist hospital granted registered 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/availability to 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 hernias was 13 times higher in males than in females. Those aged 21-40 years had the highest incidence of all the types of hernia seen. Inguinal hernia was the most common type of hernia seen in this study.

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