

ORIGINAL ARTICLE

THE MAGNITUDE AND CLINICAL PROFILE OF GALLSTONE DISEASE IN AYDER REFERRAL HOSPITAL, MEKELLE, ETHIOPIA: A CROSS-SECTIONAL DESCRIPTIVE STUDY

Mizan Kidanu MD¹, Fasika Amdeslasie MD^{1*}

ABSTRACT

Background: Gallstone disease constitutes a significant health problem in developed countries. While it was thought to be uncommon in Africa, it currently seems that the disease is more frequently seen than expected. The magnitude of gallstone disease is not well studied in Ethiopia. The purpose of this study is to determine the magnitude of the problem as seen in Ayder Referral Hospital in Mekelle.

Methods: A cross-sectional descriptive study was conducted during the period January 1, 2010 - December 31, 2013 at the Department of Surgery, Ayder Referral Hospital in Mekelle, Ethiopia. Data was obtained from chart records using a pretested structured questionnaire developed for the purposes of the study.

Results: A total of 225 patients were included in the study. The age group 30-49 years comprised one-half of the patients and over two-thirds (71.6%) of the patients were female. Abdominal pain was the predominant complaint, including right upper quadrant pain (74.7%), epigastric pain (20%), and left upper quadrant pain (4.9%). About one-third (34.7%) had radiation of the pain to the back and 15.6% to the shoulders. Fatty meal was identified as an exacerbating factor in 62.2% of the patients. One hundred and eighty-four patients were operated on; laparoscopy was done in 30.2%, and open cholecystectomy in 51.6%. Only two patients had a complicated immediate post-operative course.

Conclusion: This hospital based study result suggests that gallstone disease is not uncommon in the northern part of Ethiopia. The pattern and clinical profile of the disease is not different from what has been reported from other parts of Ethiopia and the rest of Africa. Well-designed epidemiological studies are required to determine the risk factors, the types of stones, the diagnostic value of radiological examination and the efficacy of laparoscopic management of gallstone disease.

Key words: Gallstone disease; Magnitude, Ethiopia

INTRODUCTION

Gallstone is one of the most common digestive surgical disorders worldwide (1-4). More than 95% of biliary tract affections are due to gallstone disease. Among biliary tract diseases, cholelithiasis is the leading cause of inpatient admissions for gastrointestinal problems (5,6).

Cholelithiasis is a disease associated with multiple risk factors. One of the main risk factors for developing the disease is being a female. It is four times higher in women than in men (7). Patients with gallstones can be grouped into symptomatic and asymptomatic. A primary symptom of gallstones is repeated attacks of pain, often referred to as biliary

colic. The pain is usually in the right upper quadrant or epigastric area. The symptoms are exacerbated by a fatty meal. Recurrent symptoms and gallstones on an ultrasound make the diagnosis of symptomatic cholelithiasis.

The mainstay of treatment for gallstone diseases is laparoscopic cholecystectomy, which is the most commonly used modality of treatment in the developed world. Conservative management is also one option for acute cholecystitis. Death following cholecystectomy is rare, but post-operative complications may cause severe morbidity. Gallstone disease is believed to be an uncommon disease in tropical Africa. In sub-Saharan Africa the prevalence of gallstone disease is estimated at less than 5%, while its incidence is still low in African countries as compared to the Western countries. Nowadays the disease is more frequently reported in Africa (8,9).

¹ Department of Surgery, College of health Sciences, Mekele University

* Corresponding author: mizankidanu@yahoo.com

Though the magnitude of gallstone disease in Ethiopia is not well known, the reports from some studies have suggested that it is not an uncommon disease (10-12). The purpose of this study is to determine the magnitude, clinical profile, management and outcome among patients seen at Ayder Referral Hospital (ARH) in Mekelle, Ethiopia.

PATIENTS AND METHODS

A four-year retrospective data set (January 1, 2010 to December 31, 2013) was collected using a pre-tested semi-structured data abstraction form. The source population consisted of all patients who visited ARH for emergency and elective surgery during the study period. The study subjects were all patients who were diagnosed to have gallstone disease and were admitted to the surgical ward of the hospital. The data was entered into Epi info and transferred, cleaned, and analysed using SPSS Version 20. Frequency distribution and percentages were used to describe categorical variables. Cross tabulation and chi-square test were used to evaluate the association between two categorical variables. Statistical significance was set at p-value of less than or equal to 0.5.

Ethical clearance for the study was obtained from the Research Council of Mekelle University, College of Health Sciences.

RESULTS

A total of 225 patients with gallstone disease were identified in the study period. Females constituted 161 (71.6%). One hundred and twenty-eight (60%) of them were from the urban area. The age distribution is shown in Figure 1.

Almost all, 224(99.6%) of the patients, presented with abdominal pain with a mean (SD) duration of 1.0 (± 0.9) year. The pain was in the right upper quadrant (RUQ) of the abdomen in 168(74.7%), in the epigastric area in 45(20%), and in the left upper quadrant (LUQ) in 11 (4.9%) of the patients (Table 1). In addition, 113 (50.2%) had radiation of the pain, which are to the back in 78 (34.7%) and to the shoulder in 35 (15.6%) of cases. Fatty meal was identified as an exacerbating factor for the pain in 140(62.2%) of them. The pain occurred both during the day and at night in 199(88.4%). Nausea and vomiting was reported by 104(46.2%) of them. Fever was also experienced by 58(25.8%) and anorexia by 47 (20.9%) of the cases.

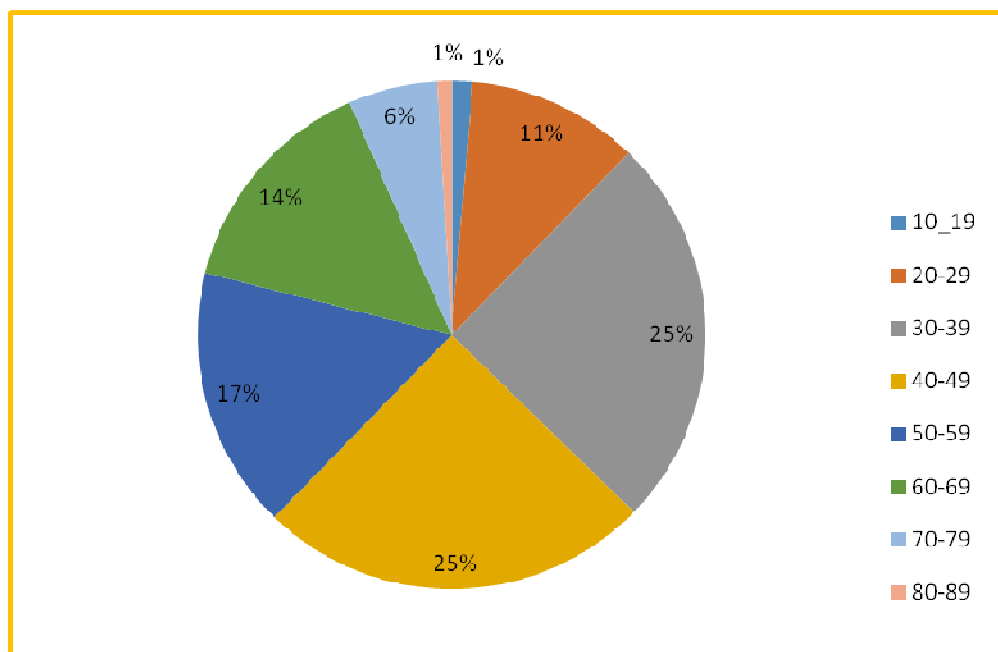


Figure 1: Age distribution of gallstone disease, January 1, 2010 – December 31, 2013,

Table 1: Frequency distribution of signs and symptoms of gallstone disease, January 1, 2010 – December 31, 2013, Ayder Referral Hospital, Mekelle, Ethiopia

Symptom/Sign		Percent
Pain		99.6
Site	Right upper quadrant	74.7
	Epigastric	20
	Left upper quadrant	4.9
Radiation		50.2
Exacerbation	Fatty Meal	62.2
	Body movement	7.1
Nausea and vomiting		46.2
Fever		25.8
Anorexia		20.9
Fever record		16.4
Tachycardia		7.1
Right upper quadrant tenderness		57.8
Guarding		2.2
Murphy's sign		18.7

Physical examination at admission showed that 37 (16.4%) of the patients had fever records of 37.5⁰C and above and 16 (7.1%) had tachycardia (pulse rate >100/min). RUQ tenderness was found in 130 (57.8%), but guarding was documented only in 5 (2.2%) of the patients. Murphy's sign was positive in 42 (18.7%) of them. One hundred and twenty-four patients (55.1 %) had their liver enzymes determined, but only 28 (12.4%) had elevated levels (>40 IU/l).

Ultrasound (U/S) was done for 216 (96%) of the cases and 79 (36.6%) of them were reported to have gallstone; while 73 (33.8%) were reported to have distended gall bladders (GB) with gallstones. Features of cholecystitis (thickened GB wall/ pericholecystic fluid) with gallstone were documented in 53 (24.5%), and gallstones were not seen in 11 (5.1%) patients who had U/S examination (Table 2).

Table 2: Abdominal ultrasound findings in gallstone disease, January 1, 2010 – December 31, 2013, Ayder Referral Hospital, Mekelle, Ethiopia

Abdominal ultrasound finding	Management			Total (%)
	Not operated (%)	Laparoscopic surgery (%)	Open surgery (%)	
No ultrasound document	8 (3.6)	0	1 (0.4)	9 (4.0)
Gallstone	6 (2.7)	29 (12.9)	44 (19.6)	79 (35.1)
Distended gallbladder with gallstone	11(4.9)	27 (12)	35(15.6)	73 (32.4)
Thick gallbladder wall /pericholecystic fluid with gallstone	7 (3.1)	10 (4.4)	36(16.0)	53 (23.6)
No gallstone	9 (4.0)	2 (0.9)	0	11 (4.9)
Total	41(18.2)	68 (30.2)	116 (51.6)	225 (100)

Review of the mode of admission showed that 179 (79.6%) were admitted on elective-and 46 (20.4%) were admitted on emergency- basis. A total of 184 (81.8%) were operated on and 41 (18.2%) were managed non-operatively (Table 3). Out of those undergoing operation, 116 (51.6%) had open cholecystectomy and 68 (30.2%) had laparoscopic cholecystec-

tomy. Total hospital stay was less than one week in 119 (52.9 %); less than 2 weeks in 84 (37.3%); and more than two weeks in 22 (9.8%) cases. Most of the patients, 208 (92.4%), were discharged improved and 15 (6.7%) reportedly left against medical advice for reasons unspecified. Only 2 (0.9%) cases had sub-phrenic abscess which needed re-operation.

Table 3: Mode of admission and management of patients with gallstone disease, January 1, 2010 – December 31, 2013, Ayder Referral Hospital, Mekelle, Ethiopia

Mode of admission	Management			Total
	Non operated	Laparoscopic surgery	Open surgery	
Elective	21	62	96	179
Emergency	20	6	20	46
Total	41(18.2%)	68(30.2%)	116 (51.6)	225(100%)

DISCUSSION

Though considered a worldwide medical problem there is a wide variation in the magnitude of gallstone disease in different geographic areas. In North American Indians, the disease is epidemic with up to 60% of women being affected. Annually 600,000 cholecystectomies are performed in the American adult population. However, the true magnitude is not known as most of the patients are asymptomatic. Studies indicate that only 10-18% of patients with gallstone disease become symptomatic (13-16).

The magnitude of gallstone disease is said to be lower in Asia and Africa than in the western world (8). In sub-Saharan Africa, the prevalence is reportedly less than 5%. The prevalence among pregnant women in Nigeria for example is as low as 2%. But this may change with the changing lifestyle and dietary habits which increase the risk of developing gallstone disease (9). In our study, 56 patients with gallstone disease were seen each year on average showing that cholelithiasis is not an uncommon surgical conditions in northern Ethiopia. A study done in Gondar University Hospital, northwest Ethiopia, found that the overall hospital prevalence of cholelithiasis among individuals above 14 years of age was 5.2% (10). Another study done in one of the referral hospitals in central Ethiopia showed that, on average, 71 patients were operated on for gallstone disease each year (11). A 5-year retrospective study done at Tikur Anbessa Teaching Hospital in Addis Ababa reported an average of 78 cholelithiasis cases each year among 747 patients surgically treated for gallbladder disease, suggesting that it is a rather common disease (12).

In our study, 128 (60%) of the study subjects were from urban areas, which is similar with the study done in Gondar University Hospital where 61.8% were from urban areas (10). One hundred and sev-

enty-nine (79.6%) were admitted on elective-basis, while 46 (20.4%) were admitted as emergency. A similar study in another part of Ethiopia showed that acute cholecystitis accounts for 10% of the operated chronic and acute cholecystitis patients (11).

Cholelithiasis is a multifactorial disease. One of the main risk factors associated with the development of the disease is the female gender as it is more common among women than men. It is four times higher in women (7). In the present study, the overall female to male ratio is 2.5:1, a similar pattern seen in most previous reports. In the study done in Gondar University Hospital, the female to male ratio was 2:1 (10). Similarly, a prospective study conducted in one of the referral hospitals of Ethiopia showed a female to male ratio for emergency admissions of 2.4:1 (11).

In our study, the commonest age group affected by gallstone disease was the age group 30-49 years followed by the group 50-59 years of age, accounting for 50% and 17% of the cases, respectively. In the Nigerian study, the most commonly affected group was the group 40-59 years of age accounting for 52.2% of cases (8). In our study, about 81% of the subjects were 30-69 years of age, which is comparable to that reported by the study from Tikur Anbessa Referral Hospital, where 80% of the subjects were in the age range of 30-60 (12).

Different complaints are expressed by patients with gallstone disease. The primary symptom of gallstone disease is repeated attacks of pain, often referred to as biliary colic. The pain is usually in the RUQ or the epigastric area. In our study, almost all patients (99.6%) presented with abdominal pain as the main complaint. This, as well as the commonest site being RUQ, is similar to a report from Italy and other previous reports (12,17). Time of occurrence of the pain is both during the day and night in our series of patients. This contrasts with what has been reported by others (17,18). Recurrent symptoms and gall-

stones on U/S help make the diagnosis of symptomatic cholelithiasis. In our study, U/S examination, a sensitive, available and affordable diagnostic means, was done in 216 (96%) of the patients. Concurring with our study, the study from Tikur Anbessa Referral Hospital showed an ultrasound gallstone detection proportion of 96% (12).

In our study, the majority (81.8%) of the patients had cholecystectomy, about one-half of them (51.6%) had open cholecystectomy and laparoscopic cholecystectomy was done in over two-thirds of the cases. This is similar to studies done in other parts of Ethiopia as well as the report from Nigeria, which have shown that a majority of the patients had open cholecystectomy (8,12). The rate of conversion from laparoscopic to open in our study is less than one percent. Conservative treatment is a management option for acute cholecystitis and in our study, 41

(18.2%) cases were managed non-operatively. The total duration of hospital stay which was less than two weeks for the majority of the patients could partly be explained by the nonsurgical treatment of most of the emergency patients. The immediate treatment outcomes of the present study are similar with that of the studies done previously (8,9,12).

Conclusion: It can be concluded that gallstone disease is not uncommon in the study area in the northern part of Ethiopia and the pattern of cholelithiasis is not different from what has been reported by others from developing settings. Future studies should focus on prospective, well designed epidemiological studies to determine the risk factors, the types of stones, the relationship between radiologic and intra-operative findings, commonly observed complications, and the frequency and outcome of laparoscopic management among patients with gallstone disease.

REFERENCE

1. Everhart JE, Khare M, Hill M, Maurer KR. Prevalence and ethnic differences in gallbladder disease in the United States. *Gastroenterology* 1999; 117(3):632-9
2. Sandler RS, Everhart JE, Donowitz M, et al. The burden of selected digestive diseases in the United States. *Gastroenterology* 2002; 122(5):1500-11
3. National Institutes of Health Consensus Conference. Gallstones and laparoscopic cholecystectomy. *American Journal of Surgery* 1993; 165:390-8.
4. Portincasa P, Moschetta A, Palasciano G. Cholesterol gallstone disease. *Lancet* 2006; 368(9531):230-9
5. Shaffer EA. Epidemiology of gallbladder stone disease. *Best Pract Res Clin Gastroenterol* 2006; 20(6):981-96
6. Russo MW, et al. Digestive and liver diseases statistics, 2004. *Gastroenterology*. 2004; 126(5):1448-53
7. Shrestha HG, Bajracharya M. Incidence of cholelithiasis and its correlation with cancer of gallbladder at TU Teaching Hospital. *JNMA* 1991; 29:264-7
8. Ganiyu A. Rahman: Cholelithiasis and Cholecystitis: Changing Prevalence in an African Community. *J Natl Med Assoc* 2005; 97:1534-8
9. Akute OO, Marinho AO, Kalejaiye AO, Sogo K. Prevalence of gallstones in a group of antenatal women in Ibadan, Nigeria. *Afr J Med Med Sci* 1999; 28(3-4):159-61
10. Getachew A. Epidemiology of gallstone disease in Gondar University Hospital, as seen in the department of radiology. *Ethiop J Health Dev* 2008; 22(2):206-11
11. Bekele Z, Tegegn K: Cholecystitis: The Ethiopian experience, a report of 712 operated cases from one of the referral hospitals. *Ethiop Med J* 2002; 40(3):209-16
12. Ersumo T: Gallstone disease in a teaching hospital, Addis Ababa: a 5-year review. *Ethiop Med J* 2006; 44 (1):49-59
13. Diehl AK: Epidemiology and natural history of gallstone disease. *Gastroenterol Clin North Am* 1991; 20:1-19
14. Chung YJ, et al: Prevalence and risk factors of gallstones in a general health screened population. *Korean Journal of Medicine* 2007; 27:480-90
15. Shaffer EA. Epidemiology and risk factors for gallstone disease: Has the paradigm changed in the 21st century? *Current Gastroenterology Reports* 2005; 7(2):132-40
16. Bartoli E, Capron J P. Epidemiology and Natural History of Cholelithiasis. *Rev Prat Journal* 2000;50(19):2112-6
17. Davide Festi et al. Clinical manifestations of gallstone disease: Evidence from the multicenter Italian study on cholelithiasis (MICOL) *Hepatology* 1999; 30(4):839-46
18. Traverso LW. Clinical manifestations and impact of gallstone disease. *American Journal of Surgery* 1993; 165 (4):405-9