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Original Research Article

Experience on the surgical management of biliary stones in Sokoto, North West Nigeria

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ABSTRACT

Background: Cholelithiasis are relatively rare in Nigeria and Africa at large. However, recently the incidence has been reported to be on the rise. We present a ten-year review of our experience in managing gallstones to highlight the recent trends in our practice.
Methods: This is a 10-year retrospective study on patients who were managed for gall bladder disease in the Usmanu Danfodiyo university teaching hospital Sokoto from August 2011 to July 2021. The biographic data, clinical features, radiologic, operative findings, histologic findings and outcome of treatment were analyzed with IBM SPSS 25.
Results: There were 82 patients over the period of the study comprising of 18 (22%) males and 64 females (78%). Their ages range was 17 to 60 years with a mean of 37.59 years ±11.02. All patients had right upper quadrant pain as the main complaint with 24 patients (29.3%) having associated epigastric pain and 14 patients (17.1%) presented with jaundice. Preoperative ultrasound (USS) diagnosis was in keeping with intraoperative diagnosis in 97.6%. All patients had cholecystectomy out of which 62 patients (75.6%) had open cholecystectomy while 20 patients (24.4%) had laparoscopic cholecystectomy. There was no hospital mortality, the average hospital stay was 8.2 days following open cholecystectomy however this was shorter, 4.5 days for laparoscopic procedure.
Conclusions: The prevalence of gallstones is still comparatively low when compared to the western world. Ultrasonography is very sensitive imaging modality. Laparoscopic cholecystectomy is safe and superior to open surgery in our environment.

Keywords: Biliary stones, Cholecystectomy, Cholelithiasis, Laparoscopic cholecystectomy, Sokoto

INTRODUCTION

Biliary diseases, most commonly cholelithiasis, are a major cause of right-upper-quadrant (RUQ) abdominal discomfort or pain. Cholelithiasis and cholecystitis are the most common of the biliary diseases in developed countries, consequently making cholecystectomy one of the most common operations. The prevalence of biliary disease in parts of Nigeria and Africa at large is relatively rare as shown by several reports.[1-3] However, recently the incidence has been reported to be on the rise in many parts of the country[1]. Eze et al in 2016 reported a prevalence of 4.40% in a study from Nnewi Southeastern Nigeria.[3] Other reports of prevalence in a particular cohort of patient have reported 3% in pregnant Nigerian women, 17% in Nigerians with type 2 diabetes mellitus and up to 16% among patients with sickle cell diseases.[4-6] Diagnosis of biliary diseases are made based on clinical, radiological and histological assessments. Some patient may be asymptomatic and diagnosis made during an

unrelated radiological examination. Abdominal sonography is a very sensitive tool in the evaluation of biliary disease, as the large accumulation of bile in the gallbladder after a fasting period makes it easy to identify most pathologies.[6]

Some of the unmodifiable risk factors for cholelithiasis include ethnic background, female sex, and familial history or genetics.[6] The modifiable risk factors include a "Western type" diet, obesity, decreased physical activity, rapid weight loss, and use of oral contraceptives. Other risk factors include pregnancy and number of child birth, drugs (e.g., ceftriaxone, octreotide, thiazide diuretics), total parenteral nutrition or fasting, and bariatric surgery.[6,7] Diseases are also risk factors, such as liver cirrhosis, type 2 diabetes, metabolic syndrome, dyslipidemia, nonalcoholic fatty liver disease, chronic hemolysis, ileal Crohn's disease, cystic fibrosis, biliary infection, infestations, and chronic hepatitis C.[6] Information on biliary diseases from this Centre is little and no recent data exist. Due to growing westernization of our dietary habit and adoption of a more sedentary lifestyle, it is anticipated that this may directly impact on the prevalence of symptomatic gallstones among other gallbladder diseases. This study aimed at evaluating the demography, pattern of presentation and the management of these patients in the general surgery unit of UDUTH Sokoto. We also reviewed the outcome of laparoscopic cholecystectomy over the conventional open cholecystectomy.

METHODS

This is a 10-year retrospective report on patients who were managed for gall bladder disease in the Usmanu Danfodiyo University Teaching Hospital Sokoto from August 2011 to July 2021. All patients managed in the general surgery unit during the research period with a diagnosis of gall bladder disease were included in the study. Patients with incomplete data were excluded from the study. Patients below the age of 18years were also excluded. A minimum sample size of 80 was calculated with the formula; during the study period 82 patients met the inclusion criteria and above the minimum sample size and thus were studied.

$$(n) = Z1 - \alpha/2\ 2p(1-p)/\ d2$$

The hospital numbers of all patient managed were retrieved from the index and coding unit of the medical records department and the general surgery unit operating theater register. Case notes were retrieved and Relevant information was obtained from patents case and these include their clinical presentations, investigations, treatments offered, treatment outcome duration of hospital stay and duration of follow up. The information was recorded on a structured proforma and then entered into IBM SPSS 25 and analyzed. The indices analyzed were biographic data, clinical features, radiologic, operative findings, histologic findings and outcome of treatment. Data set was presented in graphs and tables.

RESULTS

There were 82 patients over the period of the study comprising of 18 (22%) males and 64 females (78%), M:F of 1:3.6. Their age range was 17 to 60 years with a mean of 37.59 years ±11.02 (Figure 1).

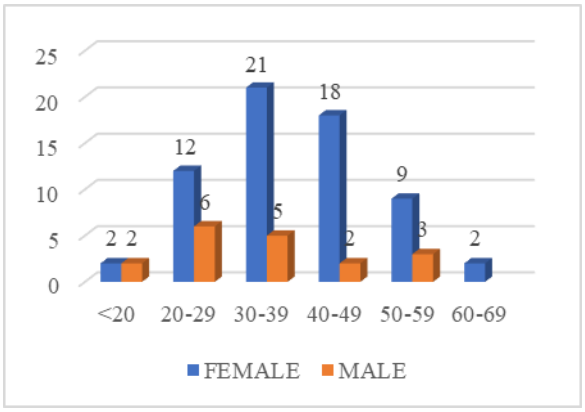

Figure 1: Age and sex distribution among the patients.

All patient had right upper quadrant pain as the main complaint with 24 patients (29.3%) having associated epigastric pain and 14 patients (17.1%) presented with jaundice. 10 patients (12.2%) were sickle cell disease patient. Distribution according to year of presentation is shown in (Figure 2), more patients were operated in the later years.

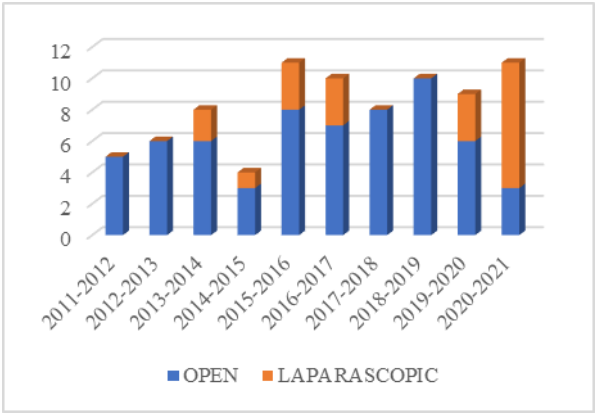

Figure 2: Yearly distribution of patient presentation and type of surgery.

Preoperative ultrasound (USS) diagnosis was in keeping with intraoperative diagnosis in 97.6%, A diagnosis of common bile duct stone found in 2 patients (2.4%) was missed on ultrasound. All patient had cholecystectomy out of which 62 patients (75.6%) had open cholecystectomy while 20 patients (24.4%) had laparoscopic cholecystectomy (Figure 2). Although 2 of the patients who had open cholecystectomy were

converted from laparoscopic cholecystectomy due to difficulty in establishing a clear anatomy around the calots triangle. Intra- operative findings revealed that 62 patients (75.6%) had calculous cholecystitis while 18 patients had chronic acalculous cholecystitis. No patient had gallbladder tumour (Table 2).

Table 1: The clinical presentation of the patients.

Clinical features	N	%
Right upper quadrant pain	82	100
Epigastric pain	24	29.3
Nausea and vomiting	5	6.1
Jaundice	14	17.1
Family history	2	2.4
Murphy's sign	30	36.6

There was no hospital mortality; the average duration of admission was 8.2 days among patients who had open cholecystectomy however there was shorter hospital stay 4.5 days among those who had laparoscopic procedure. Seven Two (72) patients (87.8%) had uneventful post operative recovery. 8 patients (9.8%) had Surgical site infection while 2patients (2.4%) had biliary leak. All the post operative complications were managed non-operatively.

Table 2: Intra operative findings among the patients.

Intra operative findings	N	%
Calculus cholecystitis	62	75.6
Solitary stone	20	24.4
Multiple stone	42	51.2
Atretic gall bladder	2	2.4
Gallbladder tumour	0	0
Acalculus cholecystitis	18	22

DISCUSSION

A total of 82 patients had surgery for gallbladder diseases in our 10-years review resulting in a hospital prevalence of 8.2 patients per year. The true incidence of gallbladder diseases in most parts of developing world especially Africa is mostly unknown; our finding shows the relative rarity of this disease in this environment. This is above the result from Calabar and compares to that from Ilorin (both centers in Nigeria) and other African countries.[8,9] The disease is still relatively rare considering the figure in our study however there is an increasing trend in the prevalence (Fig 1) which is consistent with majority of reports from Africa and worldwide that showed an increasing trend.[10–12] The increasing tends in prevalence is not unconnected with continued westernization of diet (rich in calories and deficient in fibre) and sedentary lifestyle.[13] Increase acceptance of surgery due to availability of minimal access approach could also explain the increase number of cholecystectomy in our study, this trend was also demonstrated by Adisa et al in Ife , south west Nigeria.[12] The apparent rarity seen in this study may not be a true reflection of the prevalence of the disease as many symptomatic gallstones might have been misdiagnosed and treated as peptic ulcer disease without presenting to the hospital or specialist. The relatively lower dietary cholesterol and a high fiber in our diet cannot be completely divorced from this relative low prevalence in our environment. The female to male ratio was 3.5:1, a consistent result with the world-wide preponderance of the disease in females; however this high preponderance rate is in keeping with another study,[9] but at variance with other reports locally and worldwide with a ratio of 2:1.[13,14] A relatively higher magnitude of the preponderance in females in our study compared to the world wide figure could be due to a higher chance of diagnosis in females in our environment because they have a higher chance of having an abdominal ultrasound. Females are required to do an abdominal ultrasound during prenatal assessment

The peak age of presentation of patients for cholecystectomy in this study of 30-39years with a mean of 37.59 years (SD=11.02) is in keeping with a similar study in Northern Nigeria, but at variance with similar studies from southern Nigeria, Lagos-(60-69 years), Ibadan, Enugu, (40-59 years).[14-16] The prevalence of gallstones peak in the Caucasians is in late adulthood 50-60 years similar to the trend in southern Nigeria.[7] A possible explanation for the earlier occurrence of gallstones among patients in Northern Nigeria compared to reports among southern Nigerian patients and Caucasian population is the early age at first pregnancy among the Former group. This could expose them early in life to high amounts of estrogen which have been suggested as a risk factor for gallstone formation.[13] In our study, all patient had USS preoperatively and was in keeping with the operative findings in 80 patients (95.2%) of cholecystectomies performed, the other 2 patients (2.4%) had common bile duct stone that was missed on ultrasound. This is in consistence with the general agreement in literature where Ultrasonography is the procedure of choice in suspected gallbladder; it is sensitive, specific, noninvasive, and inexpensive test for the detection of gallstones. Current high-resolution, real-time Ultrasound can identify gallstones as small as 2 mm, with a sensitivity greater than 95%.[17] The missed common bile duct stones in our study are not surprising considering the poor diagnostic accuracy of ultrasound in picking bile duct stones. Endoscopic cholangiopancreatography (ERCP) is the gold standard for Common bile duct stones (CBDS) diagnosis and enables therapeutic interventions, it remains the first line treatment for CBDS removal in most centers.[18] However, as an invasive procedure, ERCP may result in complication in 16% of patients. Avoiding unnecessary ERCP represents the best way of decreasing ERCP related complications such as post ERCP pancreatitis (PEP), bleeding, perforation and cholangitis.[18] It is thus only recommended for pre-operative diagnosis in very high risk for bile duct stones among patients with gall bladder stones (by the American society of Gastrointestinal Endoscopy).[19] Endoscopic ultrasound or

Magnetic resonance cholangiopancreatography are recommended for intermediate risk patients.[20] Diagnosis was both clinical, radiologic and confirmed by histology. The clinical picture of right upper quadrant pain present in all of the patients. Murphy's sign positive in 30 (36.6%), 14 patients (17.1%) with history of jaundice of which 10 (71.4%) of them were sickle cell disease patients and 2 patient (14.3%) had common bile duct (CBD) stone (warranting CBD exploration with T-tube insertion) is similar to the clinical picture seen in the Nigerian literature.[9-11,14] Obstructive jaundice in this environment is most commonly due to pancreatic lesions and rarely due to stone. Chronic acalculous cholecystitis was 18 (22%) in this study, others have described higher percentages 35%-44% in Nigerians with gallbladder disease.[9,14] Chronic acalculous cholecystitis could be 'pseudo' commonly attributable to microlithiasis or bilirubin granules diagnosed commonly with intra-operative ultrasound or duodenal aspiration.[21] Biliary dyskinesia is the common cause of true acalculous cholecystitis which can be from the gall bladder wall or sphincter of Oddi, these can be diagnosed with cholecystokinin stimulated emptying or sphincter of Oddi manometry respectively.[21] These diagnostic modalities are hardly available in Sub-Saharan Africa. However, the lower percentage of chronic acalculous cholecystitis in this study could be explained by the inertia of surgeons in the study center to operate patient with classical features without stones in the gallbladder on sonographic examination. The value of surgical intervention has not been clearly established in this group of patients.[21]

Open cholecystectomy was the most common procedure done for 62 (75.6%) patients while 20 (24.4%) had laparoscopic cholecystectomy and 2 patients were converted from open to laparoscopic cholecystectomy making the conversion rate 10% which is similar to that reported by misauno and salam.[22] However, it will be noted that in the later years of the study laparoscopic procedures outnumbered open procedures suggesting a change of practice due to standardization of minimal access equipment and experience of the surgical team. 20 patients (24.4%) had solitary stones while 42 (51.2%) patients had multiple stones. Other studies in this country portray similar findings.[8,9] Jungst et al demonstrated that the cholesterol nucleation time is significantly longer in the bile from patients with solitary stones (less than 1 to 16 days, median = 2.0 days) than in the bile from patients with multiple stones (less than 1 to 8 days, median=1.0 days).[23] Thus, it can be extrapolated that more Nigerian gallstones patients have a short nucleation time and may be prone to recurrence following nonsurgical management. Well-planned research may throw more light on this. There was no hospital mortality; the average duration of admission was 8.2 days among patients who had open cholecystectomy, there was shorter hospital stay of 4.5 days among those who had laparoscopic procedure however, there was no statistically significant difference in terms of complications. Ngim et al in Calabar also reported a shorter hospital stay with laparoscopic procedure suggesting a superiority of laparoscopy over open in our environment.[24] Hospitalization was prolonged by surgical site infection and biliary fistula which closed spontaneously, this is consistence with previous studies in the subregion.[9,11,14]

CONCLUSION

This review has shown that gallstone disease is the commonest indication for cholecystectomy in our environment with most patient having multiple gallstones in our environment. The prevalence of this condition is still comparatively low when compared to the western world and is commoner in females than males. Ultrasonography is very sensitive imaging modality. Laparoscopic cholecystectomy is safe and superior to open surgery in our environment.

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