Cholelithiasis and Cholecystitis: Changing Prevalence in an African Community

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Background and Objectives: Cholelithiasis and cholecystitis were thought to be rare in Africans. It is now seen more frequently than previously thought. The essence of this study is to determine the prevalence of cholelithiasis and cholecystitis in a Nigerian population, changing pattern and outcome.

Design: Descriptive study over a five-year period in an urban teaching hospital in Nigeria.

Materials and Methods: All cases of inflammatory gallbladder disease seen in the University of Ilorin Teaching Hospital, Ilorin, Nigeria, from January 1997 to December 2001 were studied prospectively. Only those who had a surgical operation and histological confirmation of cholelithiasis and cholecystitis were included in the study. The patients' demographic details, clinical presentation, findings at surgical operation and histological results of gallbladder specimens and outcome were studied.

Results: In this study, 46 patients had cholecystectomy for cholelithiasis and cholecystitis in five years. In the first three years, 18 (39.1%) cases were seen, but in the next two years 28 (60.9%) patients had cholecystectomy. The male:female ration was 1:4.8. Only four (8.7%) of these patients were obese. Thirty-two (69.6%) were multiparous. Only four (8.7%) of the patients had pigmented stones, the majority of which were mixed stones. Many of the patients have been on treatment for suspected peptic ulcer disease for a period ranging from four weeks to five years. One of the patients had Mirizzi syndrome type 1. Abdominal ultrasound was found useful in the diagnosis. All patients had open cholecystectomy. Outcome of treatment was satisfactory.

Conclusion: We are beginning to have an increase in gallbladder disease probably as a result of changing dietary habits (increase in intake of calories and cholesterol/fats) of the population. A high index of suspicion and careful clinical judgment coupled with the use of simple ancillary investigation like ultrasound will make early diagnosis and treatment feasible.

Key words: cholelithiasis ■ cholecystitis ■ open cholecystectomy ■ Nigeria

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INTRODUCTION

Cholelithiasis and cholecystitis were thought to be rare in Africans. Cholelithiasis is said to be an uncommon disease in tropical Africa.[1-4] This is in contrast to the high incidence of gallstones in western Europe and the United States. Autopsy studies have indicated that 50% of Swedish[5] and 20% of American women will eventually harbor stones.

Becker and Chatgidaki[6] in South Africa reported an incidence of 2% in a study of 4,494 autopsies over a 15-year period; a total of 92 stones were found (six stones per year). Bremner[7] in a review of disease pattern at Baragwanath Hospital (also in South Africa) found a four-fold increase of cholecystectomy in the decade 1959–1969; however, the incidence was still very small.

In a five-year review from Ibadan in 1964,[8] 35 patients—an average of seven per year—were operated on for inflammatory disease of the gallbladder. About a decade later, during a three-year period (1974–1977) in the same institution, Ajao found 19 cases, suggesting no appreciable difference.[9]

The aim of this study is to determine the prevalence, changing pattern and outcome of symptomatic inflammatory gallbladder disease in surgical practice in Ilorin, Nigeria. Ilorin is an urban town located in the middle belt of Nigeria about 160 km north of Ibadan.

MATERIALS AND METHODS

At the University of Ilorin Teaching Hospital, Ilorin, Nigeria, which is a 450-bed hospital, a total of 3,327 major operations (males: 2,097, females: 1,230) were performed during the period January 1997 to December 2001. This was excluding the obstetrics and gynecology procedures.

All cases of cholelithiasis and cholecystitis seen

in the University of Ilorin Teaching Hospital from January 1997 to December 2001 were studied prospectively. Only those who had surgical operation and histological confirmation of the diagnosis were included in the study.

The patients with acute cholecystitis were initially managed nonoperatively and had elective cholecystectomy six weeks later. Forty-six patients had cholecystectomy, which constituted 1.4% of major operations during the period and 3.1% (38/1,230) of major operations in females during the period. All the patients had prophylactic antibiotics for the cholecystectomy.

The patients' demographic details, clinical presentation (including weight and height), hemoglobin genotype, findings at surgical operation and histological result of removed gallbladder specimen and outcome were studied.

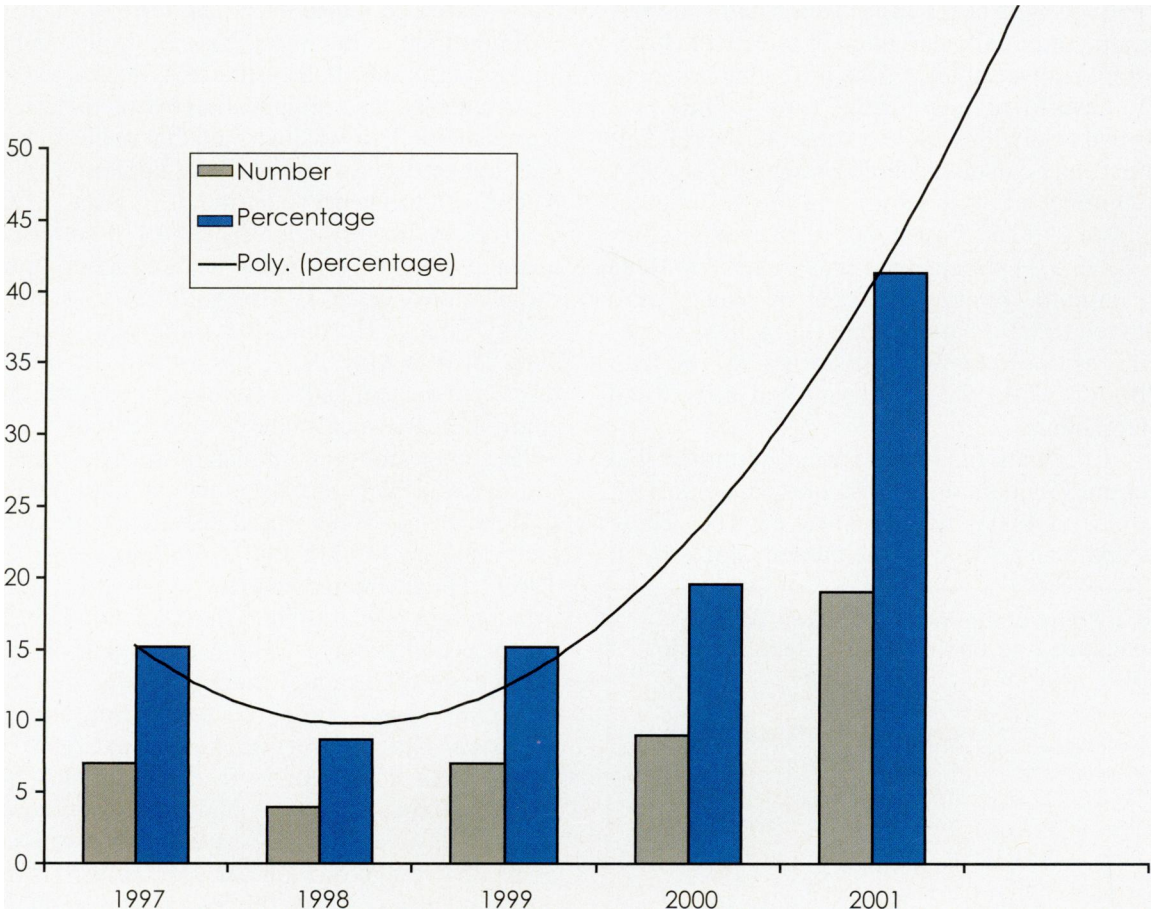
Analysis of data was done using EPI Info 6.03. (Centers for Disease Control). Findings were presented in tables and graphs as appropriate.

RESULTS

A total of 46 patients had cholecystectomy for inflammatory gallbladder disease over a five-year period (1997–2001). This gives an average of nine per year. In the first three years of this study, 18 (39.1%) patients were seen, but in the next two years 28 (60.9%) patients had cholecystectomy for inflammatory gallbladder disease. The yearly incidence is shown in Figure 1. As shown in Figure 2, the majority (52.2%) of the patients were ages 40–59 years, while 39.1% were <40 years of age. The overall male:female ratio was 1:4.8, but in patients <30 years and those >40 years, they were 3:2 and 1:13, respectively. Table 1 shows the parity of the female patients. Thirty-two of the 38 female patients had had ≥2 children at the time of presentation.

Acute cholecystitis was the mode of presentation in nine (19.7%) patients, while 37 (80.4%) presented with chronic cholecystitis. Right hypochondrial and epigastric pains were the most common symptoms, occurring in all the patients. Forty (87.0%) patients had nausea and vomiting. One patient gave a history of transient jaundice at presentation, while

Figure 1. Yearly distribution of cholelithiasis and cholecystitis in Ilorin, Nigeria, 1997–2001 (n=46)



another patient was still jaundiced at presentation. In 36 (78.3%) patients, there was history suggestive of more than one previous episode of biliary colic. About 50% of the patients had had symptoms suggestive of biliary tract disease for more than one year. Many of the patients have been on treatment for dyspepsia or suspected peptic ulcer disease for a period ranging from four weeks to five years (median was six months). There was no associated hypertension, diabetes mellitus or other comorbid obvious medical condition in these patients. On examination, six out of nine (66.7%) of the patients who presented with acute cholecystitis had a positive Murphy's sign. Only four (8.7%) patients had a body mass index (BMI) >30kg/m^2 and thus were obese. The remaining patients 42 (91.3%) had normal BMIs.

Ultrasonography was able to diagnose calculous cholecystitis in 40 out of 41 patients with stones giving a sensitivity of 97.6%. In all of these patients, the common bile duct was normal. There was one case of Mirizzi syndrome type 1 that was only diagnosed at operation. Ultrasound missed the correct diagnosis even though it picked the gallstones. There were six patients with abnormal hemoglobin (two had HbAS, four had HbSS), and the remaining 40 patients had HbAA.

All patients with acute cholecystitis had nonoperative treatment initially and interval (elective) cholecystectomy six weeks later. One of the patients was found to have Mirizzi syndrome type 1. Only five patients had acalculous cholecystitis. All the remaining patients had calculous cholecystitis.

The number of stones found in the gallbladder ranged from 1 to 250. The stones were mostly multiple in 43 (93.5%) patients and only solitary in three (6.5%) patients. Average number of stones were eight. Five (10.9%) patients had pigmented stones (four of these were known cases of HbSS, the fifth had HbAA), while the remaining had mixed and cholesterol stones.

One of the patients had transient jaundice that lasted about 72 hours during the immediate postoperative period, but it subsequently cleared. There was no death as a result of the cholecystectomy or within 30 days of the procedure.

The histopathology results of all removed gallbladders confirmed cholecystitis.

Table 1. Parity of the female patients with cholelithiasis and cholecystitis in Ilorin, Nigeria (n=38)

Parity	Number	Percentage
0	4	10.5
1	2	5.3
2	4	10.5
3	18	47.4
4+	10	26.3
Total	38	100.0

DISCUSSION

More than 95% of biliary tract diseases are attributable to cholelithiasis. Gallstones afflict 10–20% of the adult population in developed countries, including the United States. Experts estimate that 16–22 million people in the United States have gallstones—as many as one in every 12 Americans. Most people with gallstones do not know that they have them and experience no symptoms.[10] About 1 million new patients annually are found to have gallstones, of which approximately 600,000 undergo cholecystectomy.[11]

The current mean prevalence in Europe obtained from autopsy studies is 18.5%, with the lowest prevalence being reported from Ireland (5%) and the highest from Sweden (38%).[12]

In the United Kingdom, gallstones are found in approximately 10% of women in their 40s, increasing to 30% after the age of 60 years.

Cholelithiasis and cholecystitis are not as common in Africa as in Europe and North America. However, with the changing lifestyle and dietary habits, especially increased intake of fat and refined sugar, there will continue to be an increase in the incidence of cholelithiasis and cholecystitis in Africans.

In a personal communication between Burkitt and Parnis in 1963,[8] it was reported that only one case of gallbladder disease was operated upon in an African patient in Uganda over a period of 17 years. In a five-year review from Ibadan in 1964, 35 patients—an average of seven per year—were operated upon for inflammatory disease of the gallbladder. At the University College Hospital, in a three-year period from June 1974 to May 1977, 19 cases of inflammatory disease of the gallbladder were operated upon.[9] In this study, there was an average of nine per year.

Bremner analyzed admission to a hospital serving an exclusively black population and found a sixfold increase in the hospital prevalence of cholecystectomy from 1–2/100,000 in 1956 to 12/100,000 in 1969.[7] These changes were attributed to a rapidly urbanizing population and the associated changing diet, especially increased consumption of fat.

Despite the gradual increase in incidence, it is still uncommon compared to Europe and North America. The only recent exceptional report from the African continent is from Ethiopia.[13] In this (Ilorin) study, 46 patients had cholecystectomy for cholelithiasis and cholecystitis in five years. This gives an average of nine per year. In the first three years in Ilorin, 18 (39.1%) cases were seen, but in the next two years 28 (60.9%) patients had cholecys-

tectomy for inflammatory gallbladder disease.

The aphorism that gallstones occur in fair, fat, fertile females of 40 is only an approximation to the truth; people of either sex, any age, color, shape or fecundity may have gallstones. In this study, though 52.2% of the patients were between the ages of 40 and 59 years, 39.1% of the patients were <40 years of age. As in most previous studies, there is a female preponderance—male:female was 1 to 4.8. It is, however, noteworthy that in patients <30 years of age, the male:female was 3:2, but for patients age ≥40 years the male:female ratio was 1:13. This finding is different from that in developed countries where, with advancing age, the incidence in males equaled that of females. It is difficult to explain this observation. It may be that the fat intake is higher with advancing age in this population. Further study will be required to confirm this.

Obesity and parity status are usually identified as predisposing factors. BMI, also known as the Quetelet index, is far more commonly used to define obesity and has been found to closely correlate with the degree of body fat in most settings. While several acceptable classifications and definitions exist for degree of obesity, the most widely accepted is the World Health Organization (WHO) criteria based on BMI. Under this convention for adults, grade-1 overweight (commonly called overweight) is a BMI of 25–29.9 kg/m^2. Grade-2 overweight (commonly called obesity) is a BMI of 30–39.9 kg/m^2. Grade-3 overweight (commonly called severe or morbid obesity) is a BMI of ≥40.[14] Studies have shown that risk may triple in women who have a BMI of >32 compared to those with a BMI of 24–25. Risk may increase seven-fold in women with a BMI of >45 compared to those with a BMI of <24. In this study, only four (8.7%) of our patients had BMI of >30. All the remaining patients had BMI of 20–24.9.[15] Obesity may not be a predisposing factor to gallstone formation in these patients.

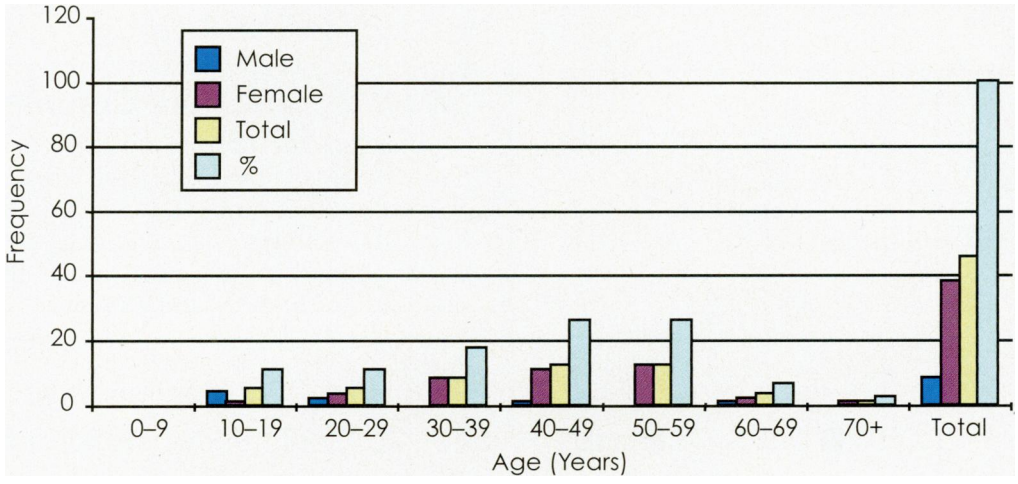
In obese people, cholesterol secretion by the liver is augmented, and this leads to further super saturation of the bile with cholesterol.[16]

Thirty-two (84.2%) of the female patients have had ≥2 children as at the time of presentation. This further confirms that multiparity may play an important role. This may be as a result of estrogenic influences, which increases the expression of hepatic lipoprotein receptors and stimulates hepatic hydroxymethylglutaryl coenzyme A (HMG CoA) reductase activity. Thus, both cholesterol uptake and biosynthesis are increased.[17]

There is a need for increased awareness on the part of healthcare providers to minimize delay in diagnosis, especially with many patients in this series being treated for peptic ulcer disease for a fairly long time. With the availability of noninvasive, inexpensive and simple diagnostic tools, such as ultrasound, the advantage should be readily utilized. The sensitivity and specificity of ultrasound in the diagnosis of gallstone and cholecystitis has been put at 98%.[18] Ultrasound is not only the most sensitive and specific test for the detection of gallstones, but it also provides information about the size of the bile ducts as well as the status of the liver parenchyma and the pancreas.

Even though gallstones date back to antiquity and were observed in the mummified corpses of the Egyptian dynasty,[19] it was only in 1882 that Carl Langenbuch performed the first open cholecystectomy in Berlin. He did more than remove the first gallbladder—he enunciated a principle that: "the gall-

Figure 2. Age and distribution of cholelithiasis in University of Ilorin Teaching Hospital, 1997–2001



bladder needs to be removed not because it contains stones but because it forms them."[20]

All patients in this series had open cholecystectomy. At the time of this study, facilities for laparoscopic cholecystectomy were not available in the study center. Laparoscopic cholecystectomy has been found useful in an African population, though there was a high conversion rate from laparoscopic cholecystectomy to open cholecystectomy attested to the severity and chronicity of disease, which made dissection of Calot's triangle problematic.[21]

Most of the patients [43 (93.5%)] had multiple stones with the highest having 250 stones. Only three (6.5%) patients had a solitary stone. This is in agreement with the findings of other Nigerian workers, and it also confirms that the majority of Nigerians with gallstones are not suitable for nonsurgical treatment.[22] The highest number of stones in a single gallbladder in a Nigerian to date is recorded by Ojukwu and Agu. The patient had 403 stones in her gallbladder.[23]

Only four (10.9%) of stones in this series were pigmented compared to the findings of Ajao in Ibadan in the late 70s, where six out of 19 patients (31.6) were found to have pigmented stones.

All the patients did well after open cholecystectomy. There was no mortality and no significant postoperative morbidity.

While the incidence of cholecystitis and cholelithiasis is still low in this environment as compared to Europe and North America, we are beginning to have an increase probably as a result of the changing dietary habit (increased caloric intake, high cholesterol/fat) of the population. There is a need to further investigate the changing dietary habit of Nigerians, especially those in urban areas, as compared to those in rural areas and relate this to increased incidence of gallstones. A high index of suspicion and careful clinical judgement coupled with the use of simple ancillary investigation, such as ultrasound, will make early diagnosis and treatment feasible.

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