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Relationship of gallstones with cholecystitis and carcinoma of gallbladder: A histopathological evaluation

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Abstract

In recent years, potential precursors of gallbladder carcinoma have been identified, making their recognition by diagnosticians clinically relevant. Gallbladders are common surgical specimens and most procedures are performed for cholecystitis and cholelithiasis. Hence based upon these literature findings the present study was planned to evaluate the relationship of gallstones with cholecystitis and carcinoma of gallbladder based upon histopathological examination.

The present study was planned in Indira Gandhi Institute of Medical Sciences, Patna in Department of Pathology in 50 patients undergoing cholecystitis. All non-neoplastic and neoplastic epithelial lesions of the gallbladder were included in the study; whereas patients with Mesenchymal and Lymphoid neoplasms were excluded from the present study.

The gallbladder specimens of all 50 patients undergone cholecystectomy, were processed for histopathological examination. Out of 50 patients, 39 patients diagnosed as various types of cholecystitis were associated with gallstones. Only one case of gallbladder carcinoma was detected in our study, which was not associated with any gallstone.

From the above findings it can be concluded that Gallstones are often clinically silent and become symptomatic when they incite inflammation. Association of carcinoma of gallbladder and cholelithiasis is frequently reported. However, in this study there were no associated gallstones in the gallbladder cancer.

Keywords: gallstones, cholecystitis, gallbladder

Introduction

Gallstones are small stones, usually made of cholesterol, that form in the gallbladder. In most cases, they don't cause any symptoms and don't need to be treated. But if a gallstone becomes trapped in an opening (duct) inside the gallbladder, it can trigger a sudden, intense abdominal pain that usually lasts between 1 and 5 hours. This type of abdominal pain is known as biliary colic. Some people with gallstones can also develop complications, such as inflammation of the gallbladder (cholecystitis).

The gallbladder is a small, pouch-like organ found underneath the liver. It's main purpose is to store and concentrate bile. Bile is a liquid produced by the liver to help digest fats. It is passed from the liver into the gallbladder through a series of channels which combine to form common hepatic duct. The bile is stored in the gallbladder and, over time, becomes more concentrated, which makes it better at digesting fats. The gallbladder releases bile into the digestive system when it is needed.

Cholecystitis is inflammation of the gallbladder. Symptoms include right upper abdominal pain, nausea, vomiting, and occasionally fever. Often gallbladder attacks (biliary colic) precede acute cholecystitis. The pain lasts longer in cholecystitis than in a typical gallbladder attack. Without appropriate treatment, recurrent episodes of cholecystitis are common. Complications of acute cholecystitis include gallstone pancreatitis, common bile duct stones, or inflammation of the common bile duct [1].

More than 90% of the time acute cholecystitis is from blockage of the cystic duct by a gallstone. Risk factors for gallstones include birth control pills, pregnancy, a family history of gall stones, obesity, diabetes, liver disease, or rapid weight loss. Occasionally acute cholecystitis occurs as a result of vasculitis, chemotherapy, or during recovery from major trauma or burns. Cholecystitis is suspected based on symptoms and laboratory tests. Abdominal ultrasonography is then typically used to confirm the diagnosis [2].

Treatment is usually with laparoscopic gallbladder removal, within 24 hours if possible. Taking pictures of the bile ducts during the surgery is recommended. The routine use of antibiotics is controversial. They are recommended if surgery cannot occur in a timely manner or if the case is complicated. Stones in the common bile duct can be removed before surgery by endoscopic retrograde cholangiopancreatography (ERCP) or during surgery. Complications from surgery are rare. In people unable to have surgery, gallbladder drainage may be tried [3].

About 10–15% of adults in the developed world have gallstones. Women more commonly have stones than men and these occur more commonly after the age of 40 years. Certain ethnic groups are more often affected; for example, 48% of American Indians have gallstones. Of all people with stones, 1–4% have biliary colic each year. If untreated, about 20% of people with biliary colic develop acute cholecystitis. Once the gallbladder is removed outcomes are generally good. Without treatment, chronic cholecystitis may occur [4].

A number of complications may occur from cholecystitis if not detected early or properly treated. Signs of complications

include high fever, shock and jaundice. Complications include the following [5]:

- Gangrene
- Gall bladder rupture
- Empyema
- Fistula formation and gall stone ileus
- Rokitansky- Aschoff sinuses

Gangrene and gallbladder rupture

Cholecystitis causes the gallbladder to become distended and firm. Distension can lead to decreased blood flow to the gallbladder, causing tissue death and eventually gangrene. Once tissue has died, the gallbladder is at greatly increased risk of rupture (perforation). Rupture can also occur in cases of chronic cholecystitis. Rupture is a rare but serious complication that leads to abscess formation or peritonitis. Massive rupture of the gallbladder has a mortality rate of 30% [6].

Empyema

Untreated cholecystitis can lead to worsened inflammation and infected bile that can lead to a collection of pus surrounding the gallbladder, also known as empyema. The symptoms of empyema are similar to uncomplicated cholecystitis but with greater severity: high fever, severe abdominal pain and more severely elevated white blood count [6].

Fistula formation and gallstone ileus

The inflammation of cholecystitis can lead to adhesions between the gallbladder and other parts of the gastrointestinal tract, most commonly the duodenum. These adhesions can lead to the formation of direct connections between the gallbladder and gastrointestinal tract, called fistulas. With these direct connections, gallstones can pass from the gallbladder to the intestines. Gallstones can get trapped in the gastrointestinal tract, most commonly at the junction between the small and large intestines (ileocecal valve). When a gallstone gets trapped, it can lead to an intestinal obstruction, called gallstone ileus, leading to abdominal pain, vomiting, constipation and abdominal distension [6].

In recent years, potential precursors of gallbladder carcinoma have been identified, making their recognition by diagnosticians clinically relevant. Gallbladders are common surgical specimens and most procedures are performed for cholecystitis and cholelithiasis.

Hence based upon these literature findings the present study was planned to evaluate the relationship of gallstones with cholecystitis and carcinoma of gallbladder based upon histopathological examination

Methodology

The present study was planned in Indira Gandhi Institute of Medical Sciences in Department of Pathology in 50 patients undergoing cholecystitis. The study was carried out from February 2016 to August 2016. Some of the cases had been diagnosed clinically and all cases had been subjected to ultrasound examination preoperatively. Resected gallbladder specimens were sent either cut opened or intact in 10% formalin. Intact specimens were opened by longitudinal incision. After gross examination, sections were taken for further histopathologic examination of tissues. The histopathological slides were examined under light microscope. The approval of the departmental ethical committee was taken prior the conduct of the study. Consents were taken in written from all the patients included in the study. The aim and the objective of the present study was informed to them.

All non-neoplastic and neoplastic epithelial lesions of the gallbladder were included in the study; whereas patients with Mesenchymal and Lymphoid neoplasms were excluded from the present study.

Results & Discussion

The data from the 50 patients identified with the non-neoplastic and neoplastic epithelial lesions of the gallbladder were collected and presented below.

Table 1: Age Distribution

Age Group	No. of Patients
15-25	5
26-35	7
36-45	18
46-55	12
56 and above	8
Total	50

Table 2: Histopathological Diagnosis

Diagnosis	No. of Cases
Chronic Calculus Cholecystitis	32
Chronic Acalculous Cholecystitis	5
Follicular Cholecystitis	2
Gangrenous Cholecystitis	1
Xanthogranulomatous Cholecystitis	1
Acute On Chronic Cholecystitis	3
Chronic cholecystitis with cholesterolosis	2
Adenomyomatous Hyperplasia of Gallbladder	1
Adenoma	1
Carcinoma	1
Normal	1
Total	50

Table 3: Histopathological diagnosis associated with gallstone

Diagnosis	No. of Cases
Chronic Cholecystitis	32
Acute on chronic Cholecystitis	2
Follicular Cholecystitis	2
Chronic cholecystitis with cholesterolosis	2
Xanthogranulomatous Cholecystitis	1
Adenomyomatous Hyperplasia of Gallbladder	1
Total	40

Pathophysiology

Cholecystitis is inflammation of the gallbladder. Cholecystitis occurs most commonly due to blockage of the cystic duct with gallstones. This blockage causes a buildup of bile in the gallbladder and increased pressure within the gallbladder, leading to right upper abdominal pain. Concentrated bile, pressure, and sometimes bacterial infection irritate and damage the gallbladder wall, causing inflammation and swelling of the gallbladder. Inflammation and swelling of the gallbladder can reduce normal blood flow to various areas of the gallbladder, which can lead to cell death due to inadequate oxygen.

Symptoms of cholecystitis can appear suddenly or develop slowly over a period of years. The main symptom is pain in the upper right side or upper middle of your belly that usually lasts at least 30 minutes. Other symptoms include severe

abdominal pains that may feel sharp or dull abdominal cramping and bloating pain that spreads to your back or below your right shoulder blade, fever, chills, nausea, vomiting, loos light-coloured stools and jaundice.

The risk factors traditionally linked with gallbladder carcinoma include cholelithiasis, obesity, reproductive factors, cholecystitis and specific chemicals. The limitations of epidemiological studies on gallbladder cancer are small sample sizes and problems in quantifying exposure to putative risk factors [7-8]. Other studies relate to prevalence of gallstones [9]. Gallstones are not the only factor. A 'syndromic approach' was adopted to investigate risk factors in a high-prevalence population. All gallbladder diseases such as cholecystitis, gallstones, gallbladder polyp and gallbladder cancer detectable with USG were included together with diet, habits and environmental pollutants.

This is the largest door-to-door survey of a rural population of North India, a region where a high prevalence of gallbladder carcinoma has been reported. Ultrasonography, a non-invasive technique with high sensitivity and specificity [10], was adopted for screening of gallbladder cancer as histological diagnosis was not feasible for screening. The survey was planned to evaluate the association of all gallbladder diseases, which also included gallbladder cancer and the predisposing factors for such gallstone diseases along with environmental factors. Such a comprehensive study was not undertaken earlier in this area of high prevalence. It was also important to identify the population at risk and plan for prevention by providing safe drinking water and considering other preventive measures.

Conclusion

From the above findings it can be concluded that Gallstones are often clinically silent and become symptomatic when they incite inflammation. Association of carcinoma of gallbladder and cholelithiasis is frequently reported. However, in this study there were no associated gallstones in the gallbladder cancer.

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