



## Assessment of histopathologic changes occurring in gallbladder mucosa in gall stone patients

Dr Trishla Chaturvedi<sup>1</sup>, Dr Seema Acharya<sup>2</sup>, Dr Rajiv Acharya<sup>3</sup>,  
Dr Vibha Gupta<sup>4</sup>

<sup>1</sup>Final year PG student, Department of Pathology

<sup>2</sup>Professor and Head, Department of Pathology

<sup>3</sup>Professor, Department of Obstetrics and Gynaecology

<sup>4</sup>Associate Professor, Department of Pathology, Shri Guru Ram Rai Institute of Medical and Health Sciences, Dehradun

**Corresponding author :Dr Trishla Chaturvedi**

### Abstract

**INTRODUCTION:** Gallstone disease causes a variety of histological abnormalities in the gallbladder mucosa, including hyperplasia, cholesterosis, metaplasia, dysplasia, and neoplasia as well as acute inflammation, chronic inflammation, and granulomatous inflammation. As a result, the current study was carried out to evaluate the histopathologic changes that gallstone patients' gallbladder mucosa underwent.

**MATERIALS & METHODS:** 100 people with gall stones who underwent laparoscopic cholecystectomy were included in the study. Every gallbladder mucosa specimen underwent standard tissue processing. Following the end of the preparation, the specimens were sectioned using a microtome before being stained with H and E stain. Following staining, histopathologic analysis was used to make the final diagnoses.

**RESULTS:** In the current investigation, 100 patients with gallstones in total were examined. The patients' average age was determined to be 42.7 years. Patients aged 40 to 49 made approximately 29% of the total population. 18% of the patients were in the 30 to 39 year old age range. Females with gallstones made up 85% of the population; the remaining 15% were men. When the gallbladder mucosal response was analysed, it became clear that chronic cholecystitis was the most prevalent diagnosis, present in 75% of the patients.

**CONCLUSION:** According to the aforementioned findings, there is a substantial correlation between gall stone parameters and pathologic alterations of the gall bladder mucosa. However, additional research is advised.

**KEY WORDS:**Gallstones, Cholecystitis

## **INTRODUCTION**

Cholelithiasis has been described as a disease of civilization. It has been observed in Egyptian mummies dating as far back as 3400 B.C. It appears likely that Charaka (two centuries B.C.) and Sushruta (six centuries B.C.) from India were also familiar with this disease of the biliary tract.<sup>1</sup>Cholelithiasis is a worldwide medical problem, but the incidence rates show substantial geographical variation, with the lowest rates reported in African populations. In most cases, they do not cause symptoms, and only 10% and 20% will eventually become symptomatic within 5 years and 20 years of diagnosis, respectively.

Gallstone disease produces diverse histopathological changes in gallbladder mucosa-namely, acute inflammation, chronic Inflammation, granulomatous inflammation, hyperplasia, cholesterosis, metaplasia, dysplasia and neoplasia. The gallbladder mucus plays a regulatory role in cholelithiasis as it promotes the nucleation of stones. Mucus, calcium and lipids act in concert to form the gallstones.<sup>2</sup>

As a result, the current study was carried out to evaluate the histopathologic changes that gall stone patients' gallbladder mucosa underwent.

## **MATERIALS & METHODS**

The goal of the current study was to evaluate the histopathologic changes that gallstone patients' gallbladder mucosa underwent. The present study included 100 individuals with gall stones who had laparoscopic cholecystectomy.

Each patient's record file contained demographic information and a clinical profile. Analyses of the haematological and biochemical data were performed both before and after surgery. Following surgery, all of the gallbladder mucosa specimens underwent standard tissue processing. Following the end of the preparation, the specimens were sectioned using a microtome before being stained with H and E stain. Following staining, histopathologic analysis was used to make the final diagnoses. Additionally, distinct intraoperative information were captured and examined. The SPSS software was used to assess all the results, which were recorded in a Microsoft Excel spreadsheet. Chi-square test was utilised to determine the degree of significance.

## **RESULTS**

In the current investigation, 100 patients with gallstones in total were examined. The patients' average age was determined to be 42.7 years. Patients aged 40 to 49 made approximately 29% of the total population. 18% of the patients were in the 30 to 39 year old age range. Females with gallstones made up 85% of the population; the remaining 15% were men.

When the gallbladder mucosal response was analysed, it became clear that chronic cholecystitis was the most prevalent diagnosis, present in 75% of the patients. A strong correlation between the quantity of gallstones and the gall bladder mucosal response was found in the current investigation. When the gallbladder mucosal response was correlated with gallstone size in the present study, significant results were obtained. Invasive lesions were more frequently associated with larger stones while cholecystitis was more frequently associated with smaller stone size. Invasive lesions were more frequently encountered in patients with multiple gallstones.

**Table 1: Gender-wise distribution**

Gender	Number of subjects	Percentage
Males	15	15%
Females	85	85%
Total	100	100%

**Table 2: Histopathologic diagnosis**

Mucosal response		Frequency	Percent
Chronic cholecystitis		75	75
Pre-invasive	Mild to moderate dysplasia	10	10
	Severe Dysplasia	5	5
Invasive	Superficial	6	6
	Deep	4	4
Total		100	100

**Table 2: Correlation of mucosal response with number of stones**

Diagnosis	No of stones			Chi-square value	p-value
	Single	Two	Multiple		

<b>Cholecystitis</b>	52	16	7	31.2654	0.000 (Significant)
<b>Pre-invasive lesions</b>	3	5	7		
<b>Invasive</b>	2	3	5		

## DISCUSSION

The estimated prevalence of cholelithiasis in India has been reported between 2% and 29%. In India, this disease is seven times more common in North than in South India.<sup>3</sup> The present study was conducted to evaluate 100 patients with cholelithiasis undergoing cholecystectomy with an aim to correlate various gallstone characteristics with morphological mucosal responses in the gallbladder.<sup>3</sup>

In this study, 100 patients with gallstones in total were examined. The patients' average age was determined to be 42.7 years. Patients aged 40 to 49 made approximately 29% of the total population. 18% of the patients were in the 30 to 39 year old age range. Females with gallstones made up 85% of the population; the remaining 15% were men. When the gallbladder mucosal response was analysed, it became clear that chronic cholecystitis was the most prevalent diagnosis, present in 75% of the patients. A strong correlation between the quantity of gallstones and the gall bladder mucosal response was found in the current investigation. When the gallbladder mucosal response was correlated with gallstone size in the present study, significant results were obtained. Invasive lesions were more frequently associated with larger stones while cholecystitis was more frequently associated with smaller stone size. Invasive lesions were more frequently encountered in patients with multiple gallstones.

Baig et al<sup>4</sup> evaluated if any correlation existed between the chemistry of gallstones and any particular histopathologic picture. Between May 1997 and December 1997, they diagnosed and operated on 40 patients with cholelithiasis. Diagnosis was established by ultrasound. After operation gallstones were sent for chemical analysis to detect presence of calcium bilirubinate and cholesterol. Serial sections of gallbladder from fundus to neck were stained by haematoxylin and eosin, and studied. Out of 40 patients (n = 40) 29 were females and 11 were males. The mean age of their patients was 38 +/- 21 years with a median of 40 years. Median age of males was 48 years compared to 38 years for females. Twenty-eight patients had mixed stones, 8 had pigment stones and 4 had cholesterol stones. Out of 28 patients with mixed stones 14 had histological picture of chronic cholecystitis, 8 had granulomatous

cholecystitis, 4 had adenomatous hyperplasia, 1 had dysplasia and 1 had carcinoma. All 8 patients having pigment gallstones had chronic cholecystitis. Out of 4 patients with cholesterol gallstones, 2 had chronic cholecystitis, 1 had adenomatous hyperplasia and 1 had cholesterosis. Gallbladder having pigment stones were devoid of Rokitansky-Aschoff sinuses.

A retrospective study was conducted at by Almas et al<sup>5</sup> in which the histopathological records of 442 gallbladder specimens obtained from cholecystectomy were analysed. The prevalence of various histopathological outcomes was assessed. The data were eventually analysed using the SPSS 23.0 software (Armonk, NY: IBM Corp.). Thereafter, the distribution of various gallbladder histopathologies was tabulated across gender. Of the 442 patients included, 330 were females and 112 were males, with the mean age hovering at 45.77±14.65 years. The most common histopathological findings were chronic cholecystitis and cholesterosis, observed in 78.6% and 32.8% of the patients, respectively. While only one case of gallbladder adenocarcinoma was observed, multiple specimens divulged premalignant lesions including reactive atypia and intestinal metaplasia. It was concluded that diseases of the gallbladder often mandated prompt surgical intervention. Of these, chronic cholecystitis, which was an established risk factor for gallbladder carcinoma, was exceedingly common.

## **CONCLUSION**

According to the aforementioned findings, there is a substantial correlation between gall stone parameters and pathologic alterations of the gall bladder mucosa. However, additional research is advised.

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