ORIGINAL RESEARCH

Study of Assessment of Histopathologic Changes Occurring in Gallbladder Mucosa in Gall Stone Patients at a Tertiary Care Hospital

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ABSTRACT
Introduction: Gallstone disease produces diverse histopathological changes in gallbladder mucosa-namely, acute inflammation, chronic Inflammation, granulomatous inflammation, hyperplasia, cholesterosis, metaplasia, dysplasia and neoplasia. Hence; the present study conducted for assessing histopathologic changes occurring in gallbladder mucosa in gall stone patients. **Materials & Methods:** A total of 200 gall stone patients who underwent laparoscopic cholecystectomy were enrolled. All the specimens of gallbladder mucosa were processed by routine tissue processing. After completion of processing, sectioning of the specimens was done under microtome followed by staining with H and E stain. After staining, all the final diagnosis was made based on histopathologic examination. **Results:** Chronic cholecystitis was the most common diagnosis found to be present in 91 percent of the patients. Both invasive and Pre-invasive diagnosis was found to be present in 4.5 percent of the patients each. Invasive lesions were more commonly encountered in patients with multiple gallstones. Invasive lesions were more commonly associated with larger stones while cholecystitis was more commonly associated with smaller stone size. **Conclusion:** A significant relationship exists between pathologic changes of gall bladder mucosa and gall stone parameters. However; further studies are recommended.

Key Words: Gallstones, Cholecystitis.

INTRODUCTION
Gallstone disease is a worldwide medical problem, but the incidence rates show substantial geographical variation Cholelithiasis has been described as a disease of civilization. Authors have been observed in Egyptian mummies dating as far back as 3400 B.C. Gallstones are becoming increasingly common; they are seen in all age groups, but the incidence increases with age; and about a quarter of women over 60 years will develop them.[1]

Since most gallstones are asymptomatic, it is essential to define exactly which symptoms are caused by gallstones: true biliary pain and/or complications, versus nonspecific abdominal complaints including dyspepsia.[2, 3]

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.[4]

Additional, several histologic variants of adenocarcinoma are recognized: papillary, intestinal, mucinous, signet-ring cell and clear cell. Many tumors contain more than one histologic variant. In the past various studies have been done to assess the correlation between types of gall stones and mucosal response.[5, 6] Hence; under the light of above evidence; the present study conducted for assessing

histopathologic changes occurring in gallbladder mucosa in gall stone patients.

MATERIALS & METHODS

The present study was conducted with the aim of assessing histopathologic changes occurring in gallbladder mucosa in gall stone patients. A total of 200 gall stone patients who underwent laparoscopic cholecystectomy were enrolled in the present study.

EXCLUSION CRITERIA

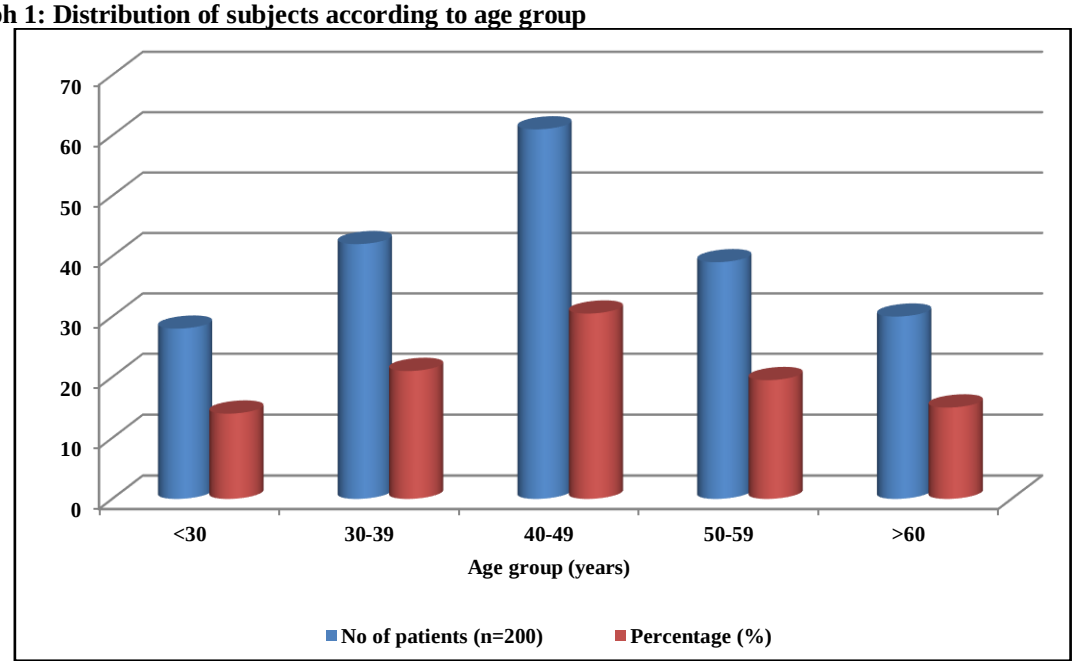
- Patient who did not have cholelithiasis such as Acalculous cholecystitis and Emphysematous cholecystitis.
- Patients already diagnosed with carcinoma, gall bladder were excluded from the study.

Demographic data and clinical profile of all the patients was obtained from their record files. Preoperative and postoperative haematological and biochemical analysis was assessed. After surgery, all the specimens of gallbladder mucosa were processed by routine tissue processing. After completion of processing, sectioning of the specimens was done under microtome followed by staining with H and E stain. After staining, all the final diagnosis was made based on histopathologic examination. Intraoperative details were also recorded separately and analysed. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi- square test was used for evaluation of level of significance.

RESULTS

In the present study, a total of 200 gallstone patients were analysed. Mean age of the patients was found to be 45.8 years. 30.5 percent of the patients belonged to the age group of 40 to 49 years. 21 percent of the patients belonged to the age group of 30 to 39 years. 82.5 percent of the gallstone patients were females while the remaining were males. While analysing the gallbladder mucosal response, it was seen that chronic cholecystitis was the most common diagnosis found to be present in 91 percent of the patients. Both invasive and Pre-invasive diagnosis was found to be present in 4.5 percent of the patients each. In the present study, a significant association was observed while associating gall bladder mucosal response with number of gallstones. Invasive lesions were more commonly encountered in patients with multiple gallstones. In the present study, while associating the gallbladder mucosal response with gallstone size, significant results were obtained. Invasive lesions were more commonly associated with larger stones while cholecystitis was more commonly associated with smaller stone size.

Graph 1: Distribution of subjects according to age group



Graph 2: Gender-wise distribution

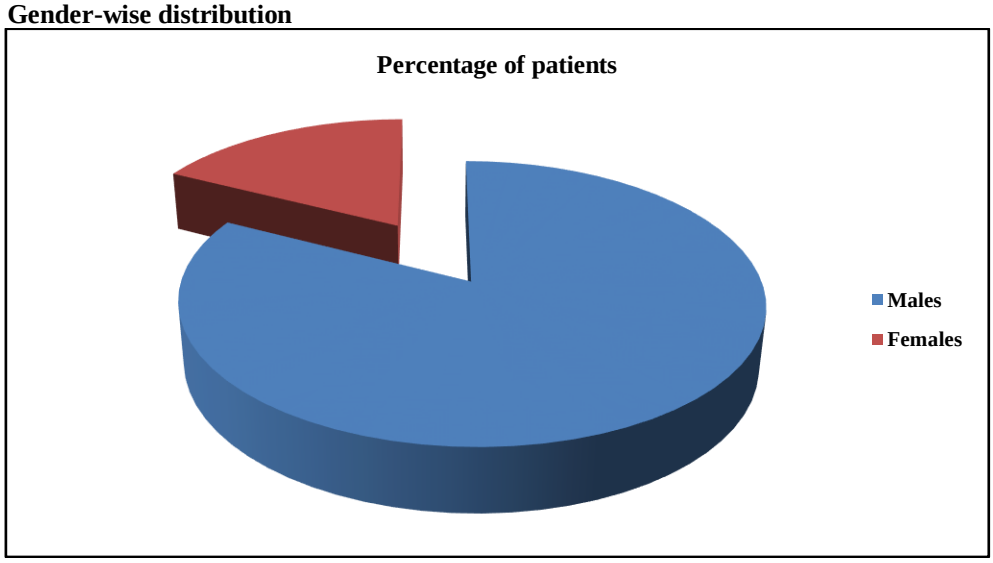


Table 1: Histopathologic diagnosis

Mucosal response		Frequency	Percent
Chronic cholecystitis		182	91
Pre-invasive	Mild to moderate dysplasia	7	3.5
	Severe Dysplasia	2	1
Invasive	Superficial	4	2
	Deep	5	2.5
Total		200	100

Table 2: Correlation of mucosal response with number of stones

Diagnosis	No of stones			Chi-square value	p-value
	Single	Two	Multiple		
Cholecystitis	73	60	49	34.852	0.000 (Significant)
Pre-invasive lesions	1	3	5		
Invasive	1	2	6		

Table 3: Correlation of mucosal response with gallstone size

Diagnosis	Mean size of stone (cm)	SD (cm)	p- value
Cholecystitis	0.73	0.29	0.001 (Significant)
Pre-invasive neoplastic lesions (dysplasia's)	1.19	0.71	
Invasive (Carcinoma)	3.75	1.85	

DISCUSSION

Gallstone disease is one of the commonly prevalent pathology of Hepatobiliary system, and annually, a gradual increase in the number of cholecystectomies has been in seen in comparison to other elective abdominal surgical procedure. In India, prevalence of gallstones ranges between two percent to twenty nine percent. The overall prevalence of the disease is seven times more common among North Indian population in comparison to South India population.[7,8] Epidemiologically, gallstone is diseases show significant alterations in terms of prevalence between persons divided on the basis of age, sex and ethnic group. Majority of the general population is unaware of the particle pathology disease and therefore, can remain asymptomatic for sometimes throughout the life. A significantly greater chances of occurrence of carcinoma of gall bladder has been seen in patient population with significantly higher prevalence of gallstones or in persons harbouring gallstones for longer duration.[9] Hence; under the light of above evidence; the present study conducted for assessing histopathologic changes occurring in gallbladder mucosa in gall stone patients.

In the present study, a total of 200 gallstone patients were analysed. Mean age of the patients was found to be 45.8 years. 82.5 percent of the gallstone patients were females while the remaining were males. By analysing the epidemiology of the gallstones, as observed in the present study, it can be inferred that gallstone diseases are more common in female adults. Possible explanation for this can be that fall in activity of cholesterol reductase and rise in activity of HMG CoA reductase with increasing age, thereby results in elevated cholesterol secretion and saturation of bile. Female sex hormones and sedentary lifestyle renders

them to parameters that possibly favour or assist in the formation of gall stones.[10]

In the present study, while analysing the gallbladder mucosal response, it was seen that chronic cholecystitis was the most common diagnosis found to be present in 91 percent of the patients. Both invasive and Pre-invasive diagnosis was found to be present in 4.5 percent of the patients each. Dattal et al.correlated the various histological changes in the gallbladder with the different types of gallstones (cholesterol, pigmented and mixed). Overall 1291 (94%) cases had chronic cholecystitis followed by acute cholecystitis and chronic active cholecystitis in 2% each, dysplasia in 1.5% and carcinoma cases 0.5%. Routine cholecystectomy performed for a common condition like gallstone disease can result in detection of diverse and wide spectrum of histopathological lesions ranging from chronic cholecystitis to carcinoma.[11]

In the present study, a significant association was observed while associating gall bladder mucosal response with number of gallstones. Invasive lesions were more commonly encountered in patients with multiple gallstones.Singh et al assessed the correlation between various gallstone characteristics. 100 patients undergoing cholecystectomy for symptomatic cholecystitis were analyzed. Gallstones were assessed for various parameters, i.e., number, size, and morphological type. Gallbladder mucosa was subjected to histopathological examination. Sections were taken from body, fundus, and neck of gallbladder. Of 100 cases, maximum type was of mixed stones (54%) and was multiple in number (46%). However, gallstone type and number are nonsignificant variables to produce precancerous lesions (i.e., hyperplasia and metaplasia). Statistically significant results were obtained while comparing the mucosal response with gallstone size ($P = 0.012$). As the gallstone size increases, the response in gallbladder mucosa changes from cholecystitis, hyperplasia, and metaplasia to carcinoma.[12]

In the present study, while associating the gallbladder mucosal response with gallstone size, significant results were obtained. Invasive lesions were more commonly associated with larger stones while cholecystitis was more commonly associated with smaller stone size. Srinivasan et al quantified the various outcomes of routine gallbladder examination following cholecystectomy procedure. Out of total 30 cases, the number of cases of calculous cholecystitis were 31 and the number of cases with pigment stones were 26, number of cases with cholesterol stone were 2 and the number of cases with mixed stones were 3. The number of cases of acalculous cholecystitis was 5. The number of cases of cholecystectomy by laparoscopy was 30 whereas the number of cases of cholecystectomy by open procedure was 6. The risk factors for developing chronic cholecystitis was seen in female gender. The predominant histomorphological pattern seen in this study group is chronic calculous cholecystitis.[13]

CONCLUSION

From the above results, it can be concluded that a significant relationship exists between pathologic changes of gall bladder mucosa and gall stone parameters. However; further studies are recommended.

REFERENCES

1. Baidya R, Sigdel B, Baidya NL. Histopathological changes in gallbladder mucosa associated with cholelithiasis. Journal of Pathology of Nepal 2012; 2: 224 – 5.
2. Baig SJ, Biswas S, Das S, Basu K, Chattopadhyay G. Histopathological changes in gallbladder mucosa in cholelithiasis: correlation with chemical composition of gallstones. In a previous study, authors Trop Gastroenterol. 2002 Jan-Mar;23(1):25-7.
3. Sharma H, Gupta G, Sharma MK. Correlation of Gallstone Characteristics with the Clinical Parameters in Cases of Cholelithiasis. International Journal of Anatomy, Radiology and Surgery, 2015 Jul, 4(3): 1-5.
4. Sharma RD. Gallbladder Mucosal Changes Occurring in Gall Stone Patients: An Observational Study. Indian Journal of Basic and Applied Medical Research. 2017; 7(1): 590-4.
5. Kumar A, Chandra PS. Assessment of Type of Mucosal Response in Gallstone Patients Undergoing Laparoscopic Cholecystectomy: A Prospective Study. International Journal of Contemporary; Medicine Surgery and Radiology. 2018;3(2): B8- B10.
6. Singh H, Kaul RK, Singh NK, Gupta A, Yadav VS. Evaluation of gall bladder mucosal changes in patients undergoing laparoscopic cholecystectomy. Int Surg J 2019;6:4108-11.
7. Onuigbo WI. A biopsy study of gallstones in Nigerian igbos. Digestion. 1977;15:353–5.
8. Halldestam I, Enell EL, Kullman E, Borch K. Development of symptoms and complications in individuals with asymptomatic gallstones. Br J Surg. 2004;91:734–8.
9. Shaffer EA. Gallstone disease: Epidemiology of gallbladder stone disease. Best Pract Res Clin Gastroenterol. 2006;20:981–96.
10. Thistle JL, Cleary PA, Lachin JM, Tyor MP, Hersh T. The natural history of cholelithiasis: The National Cooperative Gallstone Study. Ann Intern Med. 1984;101:171–5.
11. Dattal S, Kaushik R, Gulati A, Sharma VK. Morphological spectrum of gall bladder lesions and their correlation with cholelithiasis. Int J Res Med Sci. 2017 Mar;5(3):840-6.
12. Singh A, Singh G, Kaur K, Goyal G, Saini G, Sharma D. Histopathological Changes in Gallbladder Mucosa Associated with Cholelithiasis: A Prospective Study. Niger J Surg. 2019;25(1):21–5.
13. Srinivasan G, Sekar ASI. Study of histopathological spectrum of gallbladder in cholecystectomy specimens. Int J Res Med Sci 2019;7:593-9.