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Original Research Article

Evaluation of gall bladder mucosal changes in patients undergoing laparoscopic cholecystectomy

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ABSTRACT

Background: Histopathological changes induced by gall stone disease or cholelithiasis are diverse including acute inflammation, chronic inflammation, glandular hyperplasia, granulomatous inflammation, cholesterosis, dysplasia and carcinoma. Hence, this study was planned to assess gallbladder mucosal changes in patients undergoing laparoscopic cholecystectomy (LC) and it's correlation with number and types of stone.
Methods: A total of 50 patients with symptomatic cholelithiasis scheduled to undergo laproscopic cholecystectomy (LC) after written and informed consent from October 2015 to October 2018 at Teerthanker Mahaveer Medical College and Research Centre, Moradabad were followed prospectively. Preoperative biochemical profile and ultrasonography of whole abdomen of all the patients was obtained. LC was done under the hands of the skilled and experienced surgeons. Morphologic profile of gallstones was recorded and analysed. Gallbladder mucosal tissues were sent to general pathology department for analysis. Histopathological typing of all the gallbladder mucosal specimens was done and was correlated with the number and type of gallstones.
Results: In majority (76%) cases, cholecystitis was found. Hyperplasia was seen in 10% patients. Cholecystitis with metaplasia in 10 percent of the cases and carcinoma in 2 percent of the cases. While correlating the gallbladder mucosal response with the number and type of stones, non-significant results were obtained.
Conclusions: There might be some association between gall bladder mucosal changes and gall stone. We cannot say an etiologic and effective correlation from the results of this study; possible mechanism may be gall stone erodes gall bladder wall constantly over a period of time which may constitute a risk. While correlating gallbladder mucosal response with the number and type of stones, non-significant results were obtained.

Keywords: Gallbladder, Laparoscopic cholecystectomy, Mucosal

INTRODUCTION

One of the indispensible components of biliary system is the gallbladder. Biliary system comprises of liver with its blood supply, gall bladder, common hepatic duct and common bile duct. There are both intra as well as extra hepatic components of biliary system. Gall bladder comes under extra hepatic component of biliary system. Chief function of gall bladder is to store and concentrate bile.[1-3] Histopathological changes induced by gall stone disease or cholelithiasis is diverse. Few examples are acute inflammation, chronic inflammation, glandular hyperplasia, granulomatous inflammation, cholesterosis, dysplasia and carcinoma.[4,5] Components of gall stones are different. Few examples are cholesterol, pigment or mixed stones.[6] Hence, the present study was planned for assessing gallbladder mucosal changes in patients undergoing laparoscopic cholecystectomy (LC) and it's correlation with number and types of stone.

METHODS

A prospective observational study was performed at Teerthanker Mahaveer Medical College and Research Centre from October 2015 to October 2018. 50 patients with proven symptomatic gall stone disease on preoperative ultrasonography, more than 18 years of age, with normal liver function test and serum amylase and lipase levels, who consented to undergo elective laparoscopic cholecystectomy and participate in this study were included.

Exclusion criteria followed was less than 6 weeks time elapsed after the last attack of acute cholecystitis; >72 hours after the recent attack of acute cholecystitis; acute cholecystitis with raised serum amylase and lipase levels and patient not fit for surgery.

Laparoscopic cholecystectomy was performed with 04 port technique with patient under general anaesthesia under the hands of the skilled and experienced surgeons.

Morphologic profile of gallstones was recorded and analysed. Gallbladder mucosal tissues were sent to general pathology department for analysis. Histopathology of gall bladder mucosa was recorded and correlated with the type of gallstones. We recorded results in Microsoft Excel sheet. SPSS software was used to analyse results. p-value was taken significant when it was less than 0.05.

RESULTS

In our study, we analysed 50 gallstone patients. 50% patients in this study were between 40-60 years, with 45.5 years being the mean age (Table 1).

Table 1: Distribution of subjects according to age group.

Age group (years)	Frequency	%
<40	10	20
40-60	25	50
>60	15	30
Total	50	100

Table 2: Distribution of subjects according to gender.

Gender	Frequency	%
Females	35	70
Males	15	30
Total	50	100

70% (n=35) patients were female and 30% (n=15) patients were male (Table 2).

In majority (76%) cases, cholecystitis was found. Hyperplasia was seen in 10% cases, cholecystitis with metaplasia in 10 percent of the cases and carcinoma in 4 percent of the cases (Table 3).

Table 3: Distribution of subjects according to various mucosal responses.

Mucosal response	Frequency	%
Cholecystitis	38	76
Hyperplasia	5	10
Cholecystitis with metaplasia	5	10
Carcinoma	2	4
Total	50	100

Table 4: Correlation of gallbladder mucosal response with the number of stones.

Diagnosis	No. of stones			Total	Chi-square value	P value
	Single	Two	Multiple			
Cholecystitis	10	10	18	38	2.65	0.85
Hyperplasia	2	2	1	5		
Cholecystitis with metaplasia	2	2	1	5		
Carcinoma	1	0	1	2		
Total	15	14	21	50		

Table 5: Correlation of gallbladder mucosal response with the type of stones.

Diagnosis	Type stones				Total	Chi-square value	P value
	Mixed	Combined	Cholesterol	Pigmented			
Cholecystitis	20	5	5	8	38	2.55	0.98
Hyperplasia	2	1	1	1	5		
Cholecystitis with metaplasia	1	2	1	1	5		
Carcinoma	0	1	0	1	2		
Total	23	9	7	11	50		

While correlating the gallbladder mucosal response with the number and type of stones, non-significant results were obtained (Table 4 and 5; Figure 1 and 2).

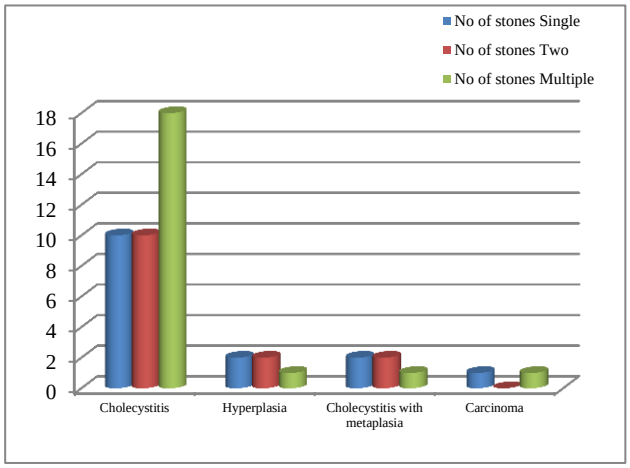

Figure 1: Correlation of gallbladder mucosal response with the number of stones.

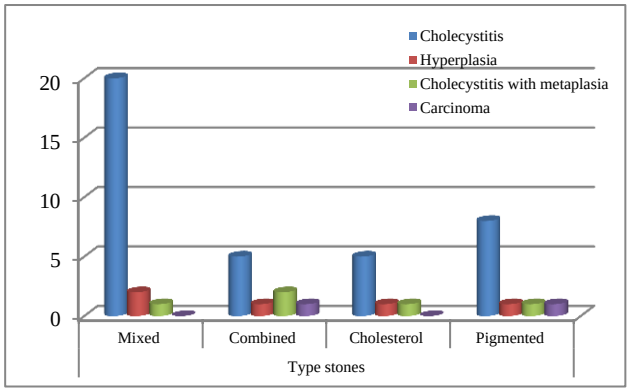

Figure 2: Correlation of gallbladder mucosal response with the type of stones.

DISCUSSION

One of the prominent organs of the human body with poor prognosis of the associated malignancies is the gallbladder cancer. Also till the present data, there is paucity in the both quantity and quality of screening methods available for early detection of gallbladder cancer.[7,8] One theory described in the past literature states that significant contribution to the progression of gallbladder cancer is given by the presence of long-term chronic inflammatory reaction. Also, it has been shown that a significant association exists between the process of cancer growth and inflammatory response.[9,10]

Main pathophysiological factors behind the gallstone disease are the cystic duct occlusion or dysfunction of the emptying mechanism of the gallbladder.

Gallstones are formed from different components such as bilirubinate or cholesterol. Elevated chances of cholecystitis and cholelithiasis are seen in pathologic states, for example sickle cell disease. In sickle cell disease increased breakdown of red blood cells leads to excess bilirubin formation which in turn renders these patients to be prone for pigmented stones formation inside gall bladder.[11,12]

Presence of metaplastic alterations in chronic cholecystitis patients is a common finding.[12]

Hence; we planned the present study for assessing gallbladder mucosal changes in patients undoing laparoscopic cholecystectomy (LC) and it's correlation with number and types of stone (s).

In our study, we analysed 50 gallstone patients. 50% patients in this study were between 40-60 years, with 45.5 years as mean age 45.5 years (Table-1). 70% (n=35) patients were female and 30% (n=15) patients were male (Table 2). Results which we got were similar to the results obtained by Baig et al. This study also reported similar demographic findings in their study.[13] In their study, Baig et al evaluated the association between composition of gallstones and histopathology picture of the mucosal response. They included total of 40 patients with gall stone disease in their study out of which 29 were females and remaining were males. Histopathology of all gall bladder specimens and chemical analysis of gall stones were obtained in all patients. Mixed type of stones was found to be present in 28 patients of their study. Pigment stones and cholesterol stones were present in their study in 8 and patients respectively. From the results, they concluded that adenomatous hyperplasia and Rokitansky-Aschoff sinuses were seen with mixed and cholesterol stones and not with pigment stones.[13]

In majority (76%) cases, cholecystitis was found. Hyperplasia was seen in 10% of the cases, cholecystitis with metaplasia in 10 percent cases and carcinoma in 4 percent of the cases (Table 3).

Our results were in concordance with the results obtained by Mathur et al in this study.[14]

In this study, 330 patients having symptomatic gall stones underwent open cholecystectomy. These stones were sent for chemical composition analysis. 59 percent patient had mixed type stone, combined stones in 25 percent, pigment stone in 9 percent and cholesterol stones in 7 percent patients. Results of this study showed that as the weight of stone increases or volume of stone increases or size of the stone increases the changes seen in the gall bladder mucosa varies from acute inflammation, chronic inflammation, glandular hyperplasia, granulomatous inflammation, cholesterosis, dysplasia and carcinoma.[14]

In the present study, while correlating the gallbladder mucosal response with the number and type of stones, non-significant results were obtained ($p>0.05$) (Table 4 and 5; Figure 1 and 2).

In one of the past study, conducted by Goyal et al, authors evaluated the association of different types of mucosal responses to different gall stones variables.

In these study 313 patients having symptomatic cholelithiasis underwent cholecystectomy.

Gall bladder specimens were sent for histopathological analysis and stones were subjected to chemical analysis. Number and volume of stones were noted. Inflammatory changes were mainly seen in males. Only females were found to be having GB hyperplasia, intestinal metaplasia, and cancer. When addressing to the question whether mucosal changes are related to size and types of stone it was found that there are possibilities between some histological alterations of GB and cancer.

CONCLUSION

There is some correlation between constant irritation of gall bladder mucosa by gall stones causing possible mucosal changes. On correlating, gallbladder mucosal response with the number and type of stones, non-significant results were obtained. However, further studies are recommended to establish the same.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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