Document heading doi: 10.21276/apjhs.2019.6.1.10 **Research Article**

Histopathological study of gall-bladder in north Indian population

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Abstract

Objective: To evaluate the histopathological pattern wall of human gallbladder in cholelithiasis.**Methods:** This was a cross-sectional study conducted in the Department of Pathology, May Institute of Medical Sciences, Barabanki, UP. Gallbladder of 50 cases aged 20-60 years were obtained from the General Surgery department of the institute.The sections obtained were carefully washed with 0.15 N saline. Then fixed into 10% formalin and processed for light microscopy. The sections were cut into 4 mm thickness and stained in H & E stain for evaluating the general histology. Different types of histological findings were noted in cholelithiasis gallbladder. The findings were noted in pre-design proforma. **Results:** About one fourth of the cases were between 21-30 & 31-40 years (28%). Majority of the cases were females (86%). Majority of the serosa was observed to be smooth (70%). Hyperplasia (28%) was found to be the most common microscopic findings followed by atrophied (18%). Normal mucosa was in 48% of the cases. **Conclusion:** Hyperplasia was found to be the most common microscopic findings followed by atrophied, ulcerated, intestinal metaplasia & proliferation with intestinal metaplasia as well as proliferation with intestinal metaplasia and ulceration with intestinal metaplasia.

Keywords: Gallbladder, Histopathological, Cholelithiasis.

Introduction

The gall bladder has been found to be the most common surgically resected organs. It presents with several spectrum of diseases. These are congenital anomalies, cholelithiasis, inflammatory and noninflammatory diseases to noninvasive and invasive neoplastic diseases. Cholelithiasis is a common syndrome affecting about 10-20% of adult populations all over World. It may affect clinically as well as histologically being a myriad of disorders encompassing acute cholecystitis, chronic cholecystitis (CC), metaplasias, hydrops, mucocele, empyema and gall stone ileus. The risk factors in developing the gall stone disease can be divided as modifiable and non-modifiable. The modifiable risk factors include obesity, rapid weight loss and sedentary lifestyle. However, non-modifiable risk factors include ethnic background, increasing age, female gender and family history[1].

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The incidence of gallstone disease differs with age and sex. In India, Gallstone disease is almost 7 times more common in north than south Indian population.It is mainly due to dietic influence. The histopathological diagnosis in majority of the cholecystectomy specimens is chronic cholecystitis. However, other benign histopathological findings of gallbladder mucosa are also found like acute inflammation, cholesterosis, metaplasia and hyperplasia[2].Gall bladder carcinoma is diagnosed histopathologically in 0.3-1.5% of cholecystectomy specimens. In 15-30% of such cases, there is no doubtful of malignancy before the operation or during the operation and thus, the disease is diagnosed microscopically postoperatively. Though carcinoma of gallbladder is rare,it is found to be the most common malignancy of the biliary tract[3]. Histopathological examination of every cholecystectomy specimen is of utmost importance and is thus mandatory also. They are so many risk factors in developing gallbladder disease[4,5]. Globally, gallstone disease remains one of the main causes of abdominal morbidity and mortality[6].The aim of this study was to evaluate the histopathological pattern wall of human gallbladder in cholelithiasis.

Material and methods

This was a cross-sectional study conducted in the Department of Pathology, May Institute of Medical Sciences, Barabanki, UP. The study was approved by the Ethical Committee of the Institute. The consent was taken from each participant before including in the study. Gallbladder of 50 cases aged 20-60 years were obtained from the General Surgery department of the institute.

Methods

The sections obtained were washed with 0.15N saline. Then fixed into 10% formalin and processed for light microscopy. The sections were cut into 4 mm thickness and stained in H & E stain for evaluating the general histology. Different types of histological findings were noted in cholelithiasis gallbladder. The findings were noted in pre-design proforma.

Statistical analysis

The results are presented in frequencies and percentages. The Chi-square test was used to find the associations. The p-value<0.05 was considered significant. All the analysis was carried out on SPSS 16.0 version (Chicago, Inc., USA).

Results

About one fourth of the cases were between 21-30 & 31-40 years (28%) followed by 41-50 &>50 years (22%). Majority of the cases were females (86%) (Table-1).

Majority of the serosa was observed to be smooth (70%) followed by Fibrosed& Greyish white (12%), congested (4%) and firm (2%). Majority of the serosa thickness was observed to be >2 mm (58%) (Table-2).

Hyperplasia (28%) was found to be the most common microscopic findings followed by atrophied (18%), ulcerated (14%), intestinal metaplasia &proliferation with intestinal metaplasia as well as praoliferation with intestinal metaplasia (8%) and ulceration with intestinal metaplasia (6%). The percentage of other microscopic findings was less than 5% (Table-3).Normal mucosa was in 48% cases followed by hemorrhagic (34%), atrophic (16%) and necrosed (2%) (Fig.1).The smooth serosa was observed to be higher in all the age groups. There was significant (p=0.03) association of serosa with age. The percentage of smooth serosa was observed to be higher in both male and females. There was no significant (p>0.05) association of serosa with gender (Table-4).The percentage of >2 mm serosa thickness was observed to be higher in all the age groups except >50 years. No significant (p>0.05) association was found between serosa wall thickness and age. The percentage of >2 mm serosa wall thickness was observed to be higher in both male and females. No significant (p>0.05) association was found between serosa wall thickness and gender (Table-5).

The percentage of normal mucosa was found to be higher in the age groups 41-50 (63.6%) and 31-40 (57.1%) years. No significant (p>0.05) association was found between mucosa and age. The percentage of normal mucosa was found to be higher in both male and females. No significant (p>0.05) association was found between mucosa and gender (Table-6).

Discussion

Gall Bladder disease is frequently encountered pathology in the biliary tract. The prevalence of gallstone disease in India has been reported to be 2-29%[7,8]. Unisaetalreported the prevalence of gall bladder disease in north India to be 6.2% (Males: 4.4% and Females: 7.3%). However, the prevalence of gall stones was 4.1% (Males: 1.9% and Females: 5.5%)[9].

In the present study, about one fourth of the cases were between 21-30 & 31-40 years (28%) followed by 41-50 &>50 years (22%). Almost similar findings had been found by Khan et al in which the age of the patients ranged from 14 to 70 years. Majority of patients was in the third decade of their life[8]. The precise cause of this disease is not well known although may be due to genetic predisposition. Male to female ratio in this study is in agreement with findings of Zahrani and Mansoor[10]. Similarly, other studies have also reported female predominance among patients with gallstone disease[7, 11]. Female sex hormones as well as sedentary habits arethe most common among women in India exposedwhich possibly stimulatein the formation of gallstones[12, 13].

Metaplasia (pyloric or intestinal) was seen in 4%cases in this study which is almost similar to a study by Zahrani and Mansoor [10]. However, some studies have shown much higher pyloric gland metaplasia (66-84%) of cholecystectomy specimens[14].This difference might due to the fact that most metaplastic findings occur focally and mostly mild changes are not reported by the pathologists. A more careful interpretation is required for the accurate rates of metaplasia in gallbladder specimens.

In this study, the majority of the serosa thickness was observed to be >2 mms (58%). In a study, the normal wall thickness was seen in 72.8% cases. Increased wall thickness (>3 mm) was evident in 27.2% cases[8]. A study by Srikanth et al observed gall bladder carcinoma in only 2 (3.3%) out of the total 60 (3.3%) cases of patients who presented with thickened gall bladder wall (>4 mm). However, they did not found statistically significant difference between the incidence of

malignancy in patients with or without thick-wall gall bladder[15].

Gall bladder carcinoma always presents with some gross abnormalities.Therefore, selective histopathology sent after intra-operative inspection of the mucosa and wall by the operating surgeon would save time and cost[16, 17]. Other studies reported that detection of incidental gall bladder carcinomas on microscopy with no evidence of gross abnormalities was not rare. Therefore, they advocateda routine histopathology of all the electively resected cholecystectomy specimens[18, 19]. However, no case of incidental gall bladder carcinoma was seen in the present study.

In the present study, hyperplasia was seen in 28%. Albores-Saavedraet al suggests that a small number of hyperplasia of gall bladder evolves towards atypical hyperplasia and that may progress to in situ carcinoma which finally becomes invasive carcinoma[20]. Another study reportedthat hyperplasia was 42.6% [21].

In the present study, the percentage of smooth serosa was found to be higher in all the age groups. The percentage of smooth serosa was found to be higher in both male and females. The percentage of >2 mm serosa thickness was found to be higher in all the age groups except >50 years. The percentage of >2 mm serosa wall thickness was found to be higher in both male and females. The percentage of normal mucosa was found to be higher in the age groups 41-50 (63.6%) and 31-40 (57.1%) years. The percentage of normal mucosa was found to be higher in both male and females. All these associations were statistically insignificant ($p>0.05$). None of the studies have reported such associations, therefore, comparisons could not be done.

One of the limitations of this study was small sample size. Therefore, there is a need of more prospective studies on these patients to determine the factors responsible for this with larger sample size.

Table-1: Distribution of demographic profile of the cases

Demographic profile	No. (n=50)	%
Age in years		
21-30	14	28.0
31-40	14	28.0
41-50	11	22.0
>50	11	22.0
Gender		
Male	7	14.0
Female	43	86.0

Table-2: Distribution of the cases according to characteristics of serosa

	No. (n=50)	%
Serosa		
Congested	2	4.0
Fibrosed	6	12.0
Firm	1	2.0
Greyish white	6	12.0
Smooth	35	70.0
Wall thickness (mm)		
≤2	21	42.0
>2	29	58.0

Table-3: Distribution of the cases according to microscopic findings

Microscopic findings	No. (n=50)	%
Atrophied	9	18.0
Dysplasia	1	2.0
Fibrosed	1	2.0
Hyperplasia	14	28.0
Intestinal metaplasia	4	8.0
Malignant	1	2.0
Metaplasia	2	4.0
Proliferation	4	8.0
Proliferation with intestinal metaplasia	4	8.0
Ulcerated	7	14.0
Ulceration with intestinal metaplasia	3	6.0

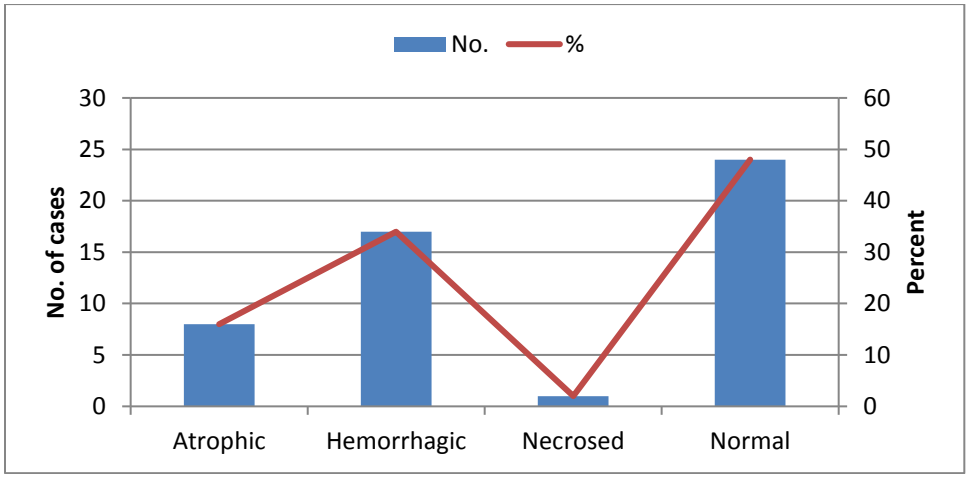

Fig. 1: Distribution of the cases according to mucosa

Table-4: Association of serosa with age and gender

Age and gender	No. of cases	Congested		Fibrosed		Firm		Greyish white		Smooth		p-value[1]
		No.	%	No.	%	No.	%	No.	%	No.	%	
Age in years												
21-30	14	0	0.0	2	14.3	0	0.0	1	7.1	11	78.6	0.03*
31-40	14	1	7.1	1	7.1	1	7.1	0	0.0	11	78.6	
41-50	11	1	9.1	3	27.3	0	0.0	0	0.0	7	63.6	
>50	11	0	0.0	0	0.0	0	0.0	5	45.5	6	54.5	
Gender												
Male	7	0	0.0	2	28.6	0	0.0	1	14.3	4	57.1	0.63
Female	43	2	4.7	4	9.3	1	2.3	5	11.6	31	72.1	

[1]Chi-square test, *Significant

Table-5: Association of serosa wall thickness with age and gender

Age and gender	No. of cases	≤2		>2		p-value[1]
		No.	%	No.	%	
Age in years						
21-30	14	5	35.7	9	64.3	0.15
31-40	14	7	50.0	7	50.0	
41-50	11	2	18.2	9	81.8	
>50	11	7	63.6	4	36.4	
Gender						
Male	7	2	28.6	5	71.4	0.45
Female	43	19	44.2	24	55.8	

[1]Chi-square test

Table-6: Association of mucosa with age and gender

Age and gender	No. of cases	Atrophic		Hemorrhagic		Necrosed		Normal		p-value[1]
		No.	%	No.	%	No.	%	No.	%	
Age in years										
21-30	14	2	14.3	6	42.9	1	7.1	5	35.7	0.70
31-40	14	3	21.4	3	21.4	0	0.0	8	57.1	
41-50	11	1	9.1	3	27.3	0	0.0	7	63.6	
>50	11	2	18.2	5	45.5	0	0.0	4	36.4	
Gender										
Male	7	2	28.6	2	28.6	0	0.0	3	42.9	0.78
Female	43	6	14.0	15	34.9	1	2.3	21	48.8	

[1]Chi-square test

Conclusion

Hyperplasia was found to be the most common microscopic findings followed by atrophied, ulcerated, intestinal metaplasia & proliferation with intestinal metaplasia as well as proliferation with intestinal metaplasia and ulceration with intestinal metaplasia.

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