

Evaluation of Liver Pathology among the Samples Received in Autopsy Section, Sir T Hospital, Bhavnagar

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ABSTRACT

Background & Aims: Liver is the most vulnerable organ to a variety of metabolic, toxic, microbial and circulatory insults. Involvement of liver in various disease processes may be primary (e.g., alcoholism) or secondary to other organs like cardiac causes or extrahepatic infections. The aim of this study is to evaluate the histopathological spectrum of liver diseases in autopsy cases. **Material and Method:** This prospective study comprises of 150 liver specimens obtained from autopsies received at Autopsy section, Department of Pathology, Government Medical College and Sir T General Hospital, Bhavnagar during the period of 1 year from 1st July 2021 to 30th June 2022. Histopathological findings of cases were recorded, analysed and expressed as frequencies and percentage. **Result:** A total of 150 specimens were studied. Age ranges from 8 months to 80 years, with M:F ratio of 4:1. Normal histology was found in 8 (5.33%) cases. Important findings included Fatty change in 59 (39.33%), Congestion in 42 (28.00%), Chronic Venous Congestion in 9 (6.00%), chronic hepatitis in 5 (3.33%), steatohepatitis in 5 (3.33%) and cirrhosis in 9 (6.00%) cases. Causes of death were: Other illness in 82 (54.67%), Sudden death in 22 (14.67%), Accidental in 21 (14%), Brought dead in 12 (8%), Suicidal in 9 (6%), Alcohol poisoning in 2 (1.33%) and Hepatic encephalopathy in 2 (1.33%) cases. **Conclusion:** Autopsy examination is very important in understanding the magnitude of clinically silent liver lesions. In this study asymptomatic fatty liver was the most common silent liver disease followed by Congestion.

Keywords: -Liver pathology, Autopsy, Fatty change, Congestion, Cirrhosis.

INTRODUCTION

Autopsy study provides valuable information about the cause of death and it also plays an important role in identifying silent disease conditions and better understanding of pathogenesis process by correlating the multisystem findings.¹ Liver is vulnerable to wide variety of metabolic, toxic, microbial, circulatory and neoplastic insults and is the most frequently injured organ in the body.^{2,3,4} Sometimes the disease is primary while in some cases it is secondary to cardiac decompensation, alcoholism or extra-hepatic infections. The spectrum of liver pathologies includes reversible condition like Fatty change to chronic and advanced end stage liver diseases like Chronic Hepatitis, Cirrhosis and Malignancy.^{5,6} Majority of chronic liver diseases even in advanced stage may cause no prominent clinical signs and symptoms. They either go undiagnosed or are found incidentally during general health check-ups, investigations for other diseases or surgery or at autopsy. These silent liver diseases may act as a contributing factor for morbidity and mortality.⁷ This study aims to determine the demographic distribution and histopathological spectrum of liver diseases in autopsy cases which can help to monitor silent liver diseases on apparently healthy individuals and also help in planning the medical strategy.

MATERIAL AND METHODS

This prospective study comprises of 150 liver specimens obtained from autopsies received during the period of 1 year from 1st July 2021 to 30th June 2022 at Autopsy section, Department of Pathology, Government Medical College and Sir T General Hospital, Bhavnagar.

All liver specimens were examined carefully for gross abnormalities. Specimens were fixed in 10% formalin and grossing was done from various representative sites after fixation. All sections were processed and stained with Harris Haematoxylin and Eosin stain as per standard departmental protocol and slides were examined under light microscope. Histopathological findings of cases were recorded, analysed and expressed as frequencies and percentage.

RESULTS

Findings of histopathological examination of total 150 specimens of liver received between 1st July 2021 to 30th June 2022 at Autopsy Section, Pathology Department of Government Medical College Bhavnagar have been included in this study.

The age of the patients varied from 8 months to 80 years with a mean age of 42.11 years. The maximum number of cases 69 (46.00%) were seen in the age group of 41-60 years. [Table 1] Out of 150 cases, 120(80.00%) were males and 30(20.00%) were females with male to female ratio of 4:1. Majority of males and females were in the age group of 21-60 years with 87.5% and 76.66% respectively.

Table No. 1: Age wise distribution of cases.

Age group (years)	No. of cases	Percentage (%)
≤20	8	5.33%
21 - 40	59	39.33%
41 - 60	69	46.00%
61 - 80	14	9.33%
TOTAL	150	100.00%

Histopathological examination showed no remarkable pathology in 8 (5.33%) cases. Most common finding in this study was Fatty change 59(39.33%) followed by Congestion 51(34.00%). Among 51 cases of Congestion, changes of Chronic Venous Congestion were seen in 9(6.00%) cases. Vacuolar change was noted in 13(8.67%) cases. Chronic Hepatitis and Steatohepatitis were found in 5 cases (3.33%) each. Cirrhosis was found in 9 (6.00%) cases. [Table 2] On gross examination, micronodular liver was noted in 6 cases and macronodular in 3 cases of cirrhosis.

Only 12 cases had history of chronic alcohol intake and all of them were males. Among these 12 cases, 5 cases show Fatty change. Cirrhosis was seen in 5 cases, 1 case show changes of Chronic hepatitis and 1 case show only Congestion.

Table No. 2: Histopathological diagnosis wise distribution of cases.

Histopathological diagnosis	No. of cases	Percentage (%)
No remarkable pathology	8	5.33%
Fatty change	59	39.33%
Congestion	51	34.00%
Vacuolar change	13	8.67%
Cirrhosis	9	6.00%
Chronic hepatitis	5	3.33%
Steatohepatitis	5	3.33%
TOTAL	150	100.00%

Specific conditions affecting the liver are mainly Fatty change, Chronic hepatitis and Cirrhosis and all of them were mainly seen in the 41-60 years of age group followed by age group of 21-40 years.

Fatty change was most commonly seen in male population whereas congestion was most common finding among female cases. Fatty change in females was seen in 30% of total female cases. All cases of cirrhosis and chronic hepatitis were seen in males.



Figure 1: Gross appearance of Nutmeg liver – cut surface

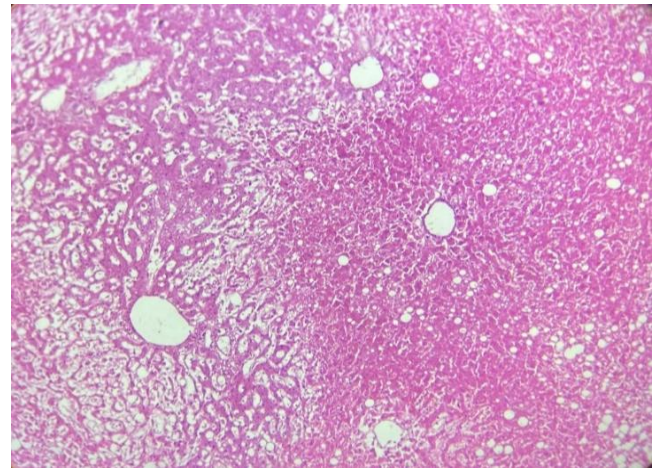


Figure 2: Chronic Venous Congestion of liver – sharp demarcation of viable hepatocytes in the periportal region versus necrotic hepatocytes in the centrilobular region (H & E stain, 10x)

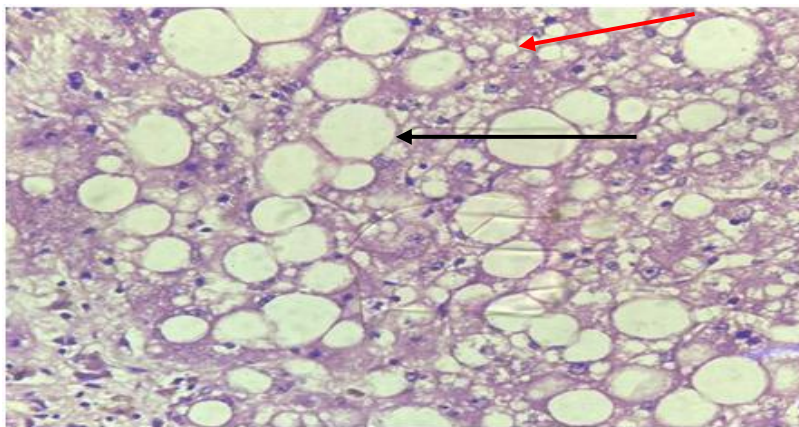


Figure 3: Steatosis – Macrovesicular (Black arrow) and Microvesicular (Red arrow). (H & E stain, 40x)



Figure 4: Gross appearance of Macronodular cirrhosis – cut surface (10x)

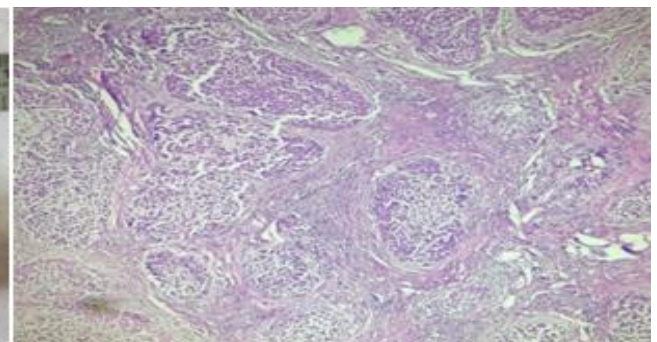


Figure 5: Cirrhosis – Regenerating nodules separated by fibrous septa (H & E stain, 10x)

Among all the autopsy cases, some kind of illness (other than liver etiology) was the most common cause of death in 82(54.67%) cases. Accidental and suicidal causes were found in

30(20.00%) cases. Death due to liver disease was found in 4(2.66%) cases. Among which, alcohol poisoning was the reason in 2(1.33%) cases and 2(1.33%) had Hepatic encephalopathy as a terminal death event.

Fatty change was found as the most common associated finding in the 98.3% cases where the cause of death was accidental or suicidal or illness other than liver etiology. Out of total 9 cases of cirrhosis, death due to hepatic encephalopathy was seen in 1 case. In 7 cases of cirrhosis cause of death event were not directly linked to the liver pathology. In two cases of death due to alcohol poisoning 1 case had associated cirrhosis on histopathological examination which can be linked to alcohol etiology. In another case of death due to alcohol poisoning finding of steatohepatitis was noted which suggest the possible mechanism of acute hepatic injury due to the same. [Table 3]

In our study, among 9 cases of cirrhosis, cause of death was sudden death in 3 cases, other illness in 3 cases and 1 case of alcohol poisoning, hepatic encephalopathy and accidental death. Cause of death was 'other illness' in majority of cases 82, from which Fatty change was noted in 39 cases. Hence, we can say that Fatty change is a common silent liver disease. [Table 3]

Table No. 3: Cause of Death wise distribution of various histopathological diagnosis.

		Histopathological Diagnosis							
Cause of Death		No remarkable pathology	Fatty change	Congestion	Vacuolar change	Cirrhosis	Chronic hepatitis	Steatohepatitis	TOTAL
	Accidental	1	7	9	2	1	1	0	21
	Brought dead	0	6	1	3	0	0	2	12
	Sudden death	0	10	6	2	3	0	1	22
	Suicidal	1	4	3	1	0	0	0	9
	Other illness	6	39	24	5	3	4	1	82
	Alcohol poisoning	0	0	0	0	1	0	1	2
	Hepatic encephalopathy	0	1	0	0	1	0	0	2
	TOTAL	8	59	42	13	9	5	5	150

DISCUSSION

In the present study majority of the specimens (46.00%) were in the age group of 41-60 years similar to the observation of Singal et al. (51.3%)³, whereas in the study of Simon KA et al.⁴ most of the patients (38.9%) were in the age group of 21-40 years. [Table-4]

Table No. 4: Comparison of age wise distribution of cases with other studies.

Age (years)	Simon KA et al ⁸	Singal et al ⁶	Present study
≤20	25.4%	2.85%	5.33%
21-40	38.9%	34.2%	39.33%
41 - 60	24.7%	51.3%	46.00%
61- 80	11.1%	11.4%	9.33%

Out of 150 cases, 120 (80.00%) were males and 30 (20.00%) were females with overall incidence showing male preponderance (M:F ratio of 4:1), a finding which compares favourably with study conducted by Singal et al³ and Simon KA et al⁴[Table 5]. This may

be attributed to the fact that males are more prone to alcohol consumption than females which is the most common etiological factor for development of various liver disease.

Table No. 5: Comparison of male and female ratio in the present study and other studies.

	Simon KA et al ⁸	Singal et al ⁶	Present study
Male	59.26%	82.8%	80.00%
Female	40.8%	17.2%	20.00%
M:F Ratio	1.5:1	4.8:1	4.0:1

The pathogenesis of liver diseases has an insidious onset so the morphological changes do not occur suddenly in a short span of time thus taking a longer time for the outcome and also extends to a wide range of histological patterns⁹. The spectrum of histopathological finding in the present study includes various non-specific changes like Congestion, Vacuolar change to specific conditions of the liver diseases like Fatty change, Steatohepatitis, Chronic hepatitis and Cirrhosis.

Table No. 6: Comparison of histopathological diagnosis in the present study and other studies.

Histopathological Diagnosis	Bhagat R et al ¹⁰	Porwal et al ³	Singal et al ⁶	Present study
Chronic hepatitis	18.3%	30.13%	9%	3.33%
Steatohepatitis	-	18.21%	-	3.33%
Congestion	10%	49.31%	27%	34.00%
Cirrhosis	7.5%	3.42%	11%	6.00%
Fatty change	32.5%	39.72%	34%	39.33%
No remarkable pathology	21.7%	6.84%	9%	5.33%

Fatty change in liver was most common histopathological finding in this study with 39.33% cases which was similar to studies done by Singal et al³ (34%), Porwal et al¹¹ (39.72%) and Bhagat R et al (32.5%)¹⁰. It is because Fatty change in the liver is caused by a variety of etiology like alcohol, obesity, diabetes, hepatotoxins, drugs, etc. It can be seen as the commonest isolated finding or with other chronic condition and advanced liver disease like chronic hepatitis and cirrhosis respectively. In present study among majority of cases of Fatty change, cause of death was due to illness other than primary liver etiology. This finding suggest that fatty change may not cause increase in mortality directly but may contribute as a co-factor raising the morbidity associated with 'other illness.'

Venous congestion was the second most common finding seen in this study (34.00%) slightly lower than fatty change, which was also the second most common finding in study by Singal et al³ with 27% cases. Whereas in study done by Porwal et al¹¹ congestion was the most common finding followed by fatty change. Circulatory failure is evident in almost all non-traumatic deaths resulting in venous congestion in most of the liver autopsies. Among the cases of venous congestion, 9 were of Chronic Venous Congestion accounting for 6.00% of total liver autopsies which may be secondarily related to other organ disorders like right heart failure, restrictive cardiomyopathy and right sided valvular disease.

Chronic hepatitis was seen in 5 cases (3.33%) and all of them were males. Similarly, Bal et al¹², reported 3 % cases of hepatitis and Sotoudehmanesh, Sotoudeh et al¹³ reported chronic hepatitis in 2.6% of cases. While, study by Porwal et al contradicted our results with 30.13% cases of chronic hepatitis.¹¹ 5 cases (3.33%) showed the features of Steatohepatitis and all of them were males, whereas, study by Porwal et al noted higher cases with 18.21%.¹¹

Cirrhosis liver was seen in 9 cases (6.00%) in our study. Various other studies conducted by Ghazala, Hannan et al¹⁴ and Bhagat R et al¹⁰ reported similar cases of cirrhosis with 4.5% and 7.5% of total cases respectively. While, the study by Porwal et al noted lower cases

with 3.42% and Singal et al higher cases with 11% of total cases.^{3,11} All the nine cases of our study were males and majority (77.78%) were in the age group of 41-60 years. Out of 9 cases, 5 had history of chronic alcoholism suggesting alcohol as an etiological factor among these cases.

CONCLUSION

Histopathological examination findings of liver in autopsy cases are of a great help in determining the presence of silent liver conditions without noticeable clinical symptoms. Although it may not contribute directly to death but it may act as a co-morbid factor along with illness of other systems. In our study Fatty change was the most common silent liver disease followed by Congestion. Although, autopsy do not reflect the actual pattern of liver diseases, but emphasizes the need of further studies for early detection and treatment of vulnerable groups. It provides the base for further requirement of detailed or thoughtful search for the association of specific disease condition with possible etiological factor and implementation of the preventive measures. Also, it is a great learning tool to study the spectrum of liver diseases which is of great value in improving the vision and diagnostic setup for clinical assessment.

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