

Histopathological Study on Autopsy Liver Specimens in a Tertiary Care Institute of Punjab

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Abstract

Introduction: Autopsy also known as postmortem examination is done to find out the cause of death, time since death and to know the extent of disease. It also helps to identify any undiagnosed disease present in the person which can be confirmed histopathologically. This helps in increasing the knowledge of both pathologist and forensic experts. Liver being the principal site of many metabolic activities, is most frequently injured organ in the body. Various liver diseases are classified as primary and secondary. This study was done to analyse the various disease patterns of liver found at autopsy and histopathologically which were either incidental or were directly related cause of to death.

Aim and objectives: To study the spectrum of liver diseases in autopsy specimen along with histopathological examination.

Material and Methods: This retrospective study was carried out in a tertiary care hospital in the department of pathology over a period of four and a half years. A total of 110 cases of liver specimens of postmortem cases, received as part of liver or whole liver were included in the study. The specimens were received in 10% formalin. After gross examination, sections from representative area were submitted for histopathological processing. After processing tissues were sectioned and stained with H&E stain. Slides were examined and the findings were noted. Findings were calculated as percentage.

Results: Liver diseases are more common in males as compared to females. Out of 110 cases, 86 (78.19%) were males and 24 (21.81%) were females (Ratio M: F 3.5:1). and the most affected age group being 31-40 years. Congestion was seen in maximum number of cases (37.27% cases) followed by fatty change (28.18%) and least were seen with necrosis (0.91%)

Conclusion: This study highlights the importance of histopathological report in liver autopsy cases.

Keywords: Fatty liver, Congestion, Cirrhosis, postmortem, autolysis

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Introduction:

The word “autopsy” is derived from the Ancient Greek word *autopsia*, means “to see for oneself” *autos* (“oneself”) and *opsis* (“eye”). [1] An autopsy also called as a post-mortem examination, is a highly specialized surgical procedure that consists of a thorough examination of a corpse to determine the cause and manner of death and to evaluate any disease or injury that may be present. [2] It is helpful in finding the ante-mortem as well as post-mortem causes of death. [3] It also helps to identify any undiagnosed disease present in the person which are confirmed histopathologically. This helps in increasing the knowledge of both pathologist and forensic experts. So, autopsy along with histopathology serves as an important learning tool. [4] But there are some lacunae in autopsy histopathological diagnosis like poorly preserved tissue, delay in carrying out autopsies, improper sampling, improper preservation and delay in the transportation of the specimen. Still, microscopic examination is very useful method to study the disease process. [5] Various organs received in autopsy includes liver, lungs, heart, spleen and many more. Liver is one of the organs which is commonly received in autopsy viscera.

Liver being the principal site of many metabolic activities, is most frequently injured organ in the body. The diseases of liver are divided as primary or secondary.

The various primary diseases of the liver are hepatitis, alcoholic liver disease, cirrhosis circulatory disturbances and neoplasms. Many secondary causes of liver are cardiac de-compensation, alcoholism or extrahepatic infections. Quite rightly liver is, called as “The custodian of milieu interior”. [6] The underlying cause of liver disease vary in different parts of the world and are based on factors such as age, sex, socio-economic

status, food habits, lifestyle, locally and associated infections. [7]

The main aim of this study was to analyse the various disease patterns of liver found at autopsy and histopathologically which were either incidental or were directly related cause of to death.

Materials and Methods

This is a retrospective 4.5 years study carried out in the Department of Pathology of a tertiary care institute of Punjab from June 2016 to December 2020, A total of 110 cases of liver specimens, received as part of liver or whole liver in the department were analysed with reference to light microscopic changes. In each case the clinical findings (Age, Sex, clinical changes, suspected cause of death and post-mortem changes) were obtained from post-mortem reports and inquest reports sent along with the viscera. The viscera were received in 10% formalin solution and then after gross examination the pieces were processed as routine histopathological processing and further subjected to routine haematoxylin and eosin staining. Slides were seen under microscope and the histopathological findings were recorded in each case. Findings were calculated as percentage.

Results:

In the present study, out of 110 cases, 86 (78.19%) were males and 24 (21.81%) were females (Ratio M: F 3.5:1). [Table 1]

The age ranged from newborn to 76 years. Majority of patients belonged to age group of 31 to 40 years. [Table 2]

Various histopathological findings seen in liver included fatty change, steatohepatitis, chronic hepatitis, granulomas etc. [Table 3] Congestion was seen in maximum number of cases (37.27% cases) followed by fatty

change (28.18%) and least were seen with necrosis (0.91%). Case with necrosis had history of drug overdose. Two cases having granulomas in liver had similar findings in

lungs, spleen and kidneys also. It was also seen that all these disease patterns are more common in males as compared to females. [table 4]

Table 1: Distribution of cases according to sex with percentage

S no	Sex	No of cases	Percentage (%)
1.	Males	86	78.19
2.	Females	24	21.81
	Total	110	100

Table 2: Distribution of cases according to age groups with percentage

Sno	Age group	No of cases	Percentage
1	Less than 10 years	3	2.73
2	11-20	11	10
3	21-30	24	21.82
4	31-40	28	25.45
5	41-50	22	20
6	51-60	13	11.82
7	61-70	4	3.64
8	71-80	5	4.54
	Total	110	100

Table 3: Various histopathological findings of liver

Histopathological findings	Total	Percentage
FATTY CHANGE	31	28.18
CONGESTION	41	37.27
Fatty Change +CONGESTION	5	4.55
CIRRHOSIS	9	8.18
STEATOHEPATITIS	3	2.73
CHRONIC HEPATITIS	4	3.64
AUTOLYSED	11	10
UNREMARKABLE	3	2.73
NECROSIS	1	0.91
Granuloma	2	1.81
Total	110	100

Table 4: Gender wise distribution of various histopathological findings of liver

Histopathological finding	Males	Females	Total
FATTY CHANGE	25	6	31
CONGESTION	26	15	41
Fatty Change and CONGESTION	5	0	5
CIRRHOSIS	9	0	9
STEATOHEPATITIS	3	0	3
CHRONIC HEPATITIS	3	1	4

AUTOLYSED	10	1	11
UNREMARKABLE	2	1	3
CENTRILOBULAR NECROSIS	1	0	1
Granuloma	2	0	2
Total	86	24	110

Table 5: Age group wise distribution of various histopathological findings of liver

	Less than 10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
FATTY CHANGE	0	0	4	16	4	4	1	2	31
CONGESTION	3	7	16	6	6	0	1	2	41
Fatty Change +CONGESTION	0	0	0	0	2	3	0	0	5
CIRRHOSIS	0	0	0	1	3	3	2	0	9
STEATOHEPATITIS	0	0	0	1	2	0	0	0	3
CHRONIC HEPATITIS	0	1	0	1	0	2	0	0	4
AUTOLYSED	0	3	2	1	3	1	0	1	11
UNREMARKABLE	0	0	1	2	0	0	0	0	3
CENTRILOBULAR NECROSIS	0	0	0	0	1	0	0	0	1
Granuloma	0	0	1	0	1	0	0	0	2
Total	3	11	24	28	22	13	4	5	110

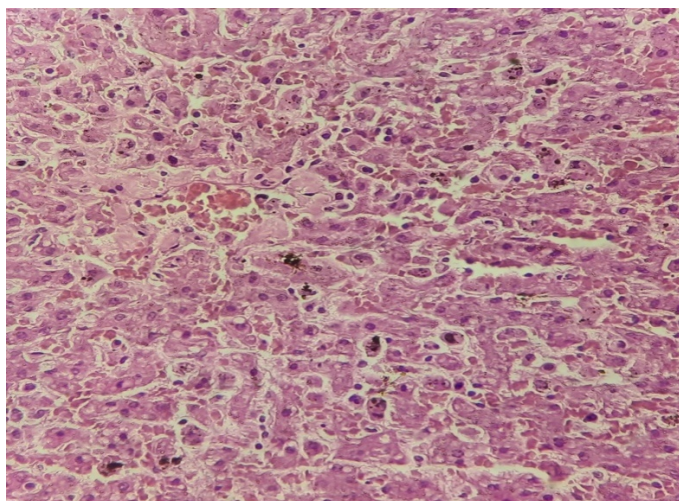


Figure 1: Histological section of liver showing congestion (H&E stain – 10x X 40x)

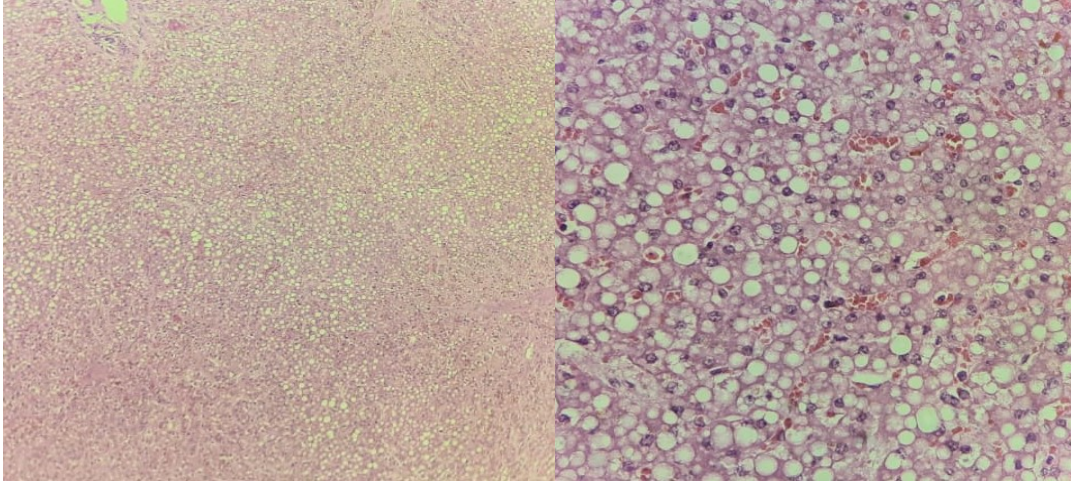


Figure 2: Low power and high-power view of histological sections of liver showing fatty change and congestion (H &E Stain – 10x X 10x and 10xX40x)



Figure 3: Gross examination of liver showing micronodular cirrhosis.



Figure 4: Gross examination of liver showing mixed pattern of cirrhosis i.e. micronodular and macronodular cirrhosis.

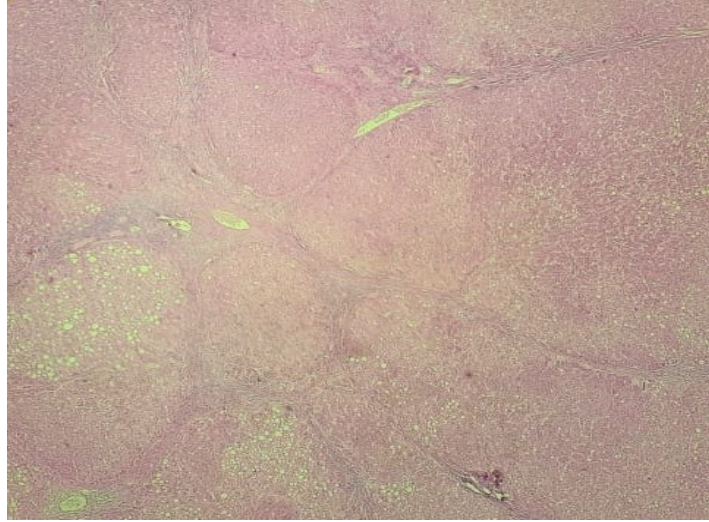


Figure 5: Histological section of liver showing parenchymal nodules surrounded by fibrous bands (H &E Stain – 10x X 10x)

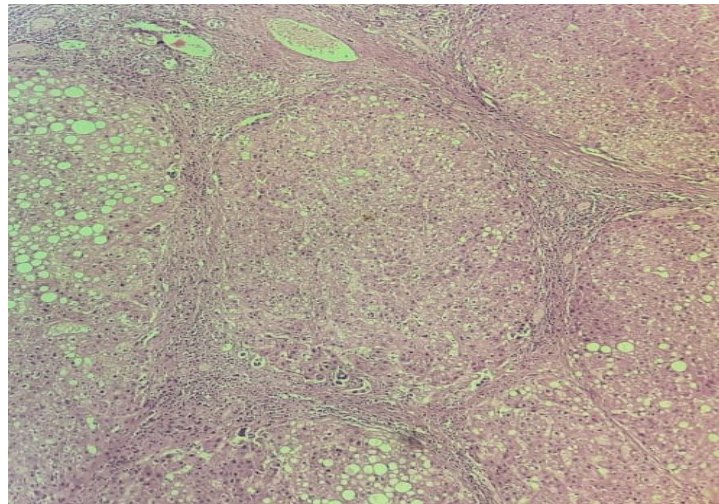


Figure 6: Histological section of liver showing parenchymal nodule surrounded by fibrous bands and inflammatory cell infiltrate around portal triad. (H &E Stain – 10x X 40x)

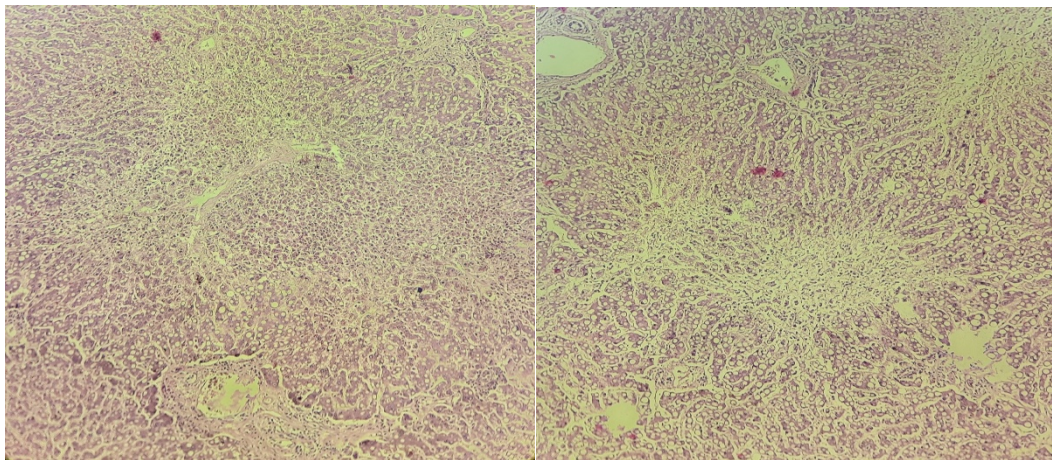


Figure 7: Histological section of liver necrosis of hepatocytes. (H&E stain – 10x X 40x)

Table 6: Comparison of our study with other studies in various histopathological findings of liver.

Histopathological findings	Our study	Bal et al [6]	Bhagat et al [19]	Behera et al [20]	Selvi et al [11]	Alagarsamy et al	Patel et al [12]	Sotoudehmanesh et al [8]	Shete et al [7]
FATTY CHANGE	28.18	39	32.5	21.87	26.9	20	35.69	31.6	14.29
CONGESTION	37.27	9	10	20.31	16.7	26	1.22		26.33
FC+CONGESTION	4.55								
CIRRHOSIS	8.18	14	7.5	9.37	7.4	16	2.44	0.8	6.44
STEATOHEPATITIS	2.73			3.12				2.1	
CHRONIC HEPATITIS	3.64	3	18.3	12.5	13.9	10	0.98	2.6	11.48
AUTOLYSED	10		5.8	3.12					
UNREMARKABLE	2.73	30	21.7	26.56	25.9	22	56.97		35.02
CENTRILOBULAR NECROSIS	0.91		3.3 (necrosis)				1.22		
Granuloma (Tuberculosis)	1.81		0.8				0.49	0.2	2.80
Total	100								

Discussion:

Histopathological examination of viscera is an important part of autopsy and is useful in diagnosing many incidental findings in the present study liver diseases were most commonly seen in males 78.19% as compared to females 21.81%. This is comparable to studies done by Bal MS et al (83%) [6] and Sotoudehmanesh R et al (486.7%). [8] This may be since men are more prone to alcohol consumption especially in Punjab.

Congestion of liver [Fig 1] is end stage of the death seen in most of the liver autopsies. Our study showed only congestion 37.27% of cases and congestion with fatty change in 4.55% of cases. Similarly, Alagarsamy reported maximum cases of congestion (26%) [9] whereas Bal et al reported congestion in only 9% of cases.[6] Copeland et al reported congestion with fatty change in 3.4% of liver autopsies of alcoholics who died suddenly.[10] The present study revealed congestion and fatty change in 4.55% cases, which is comparable to Copeland's findings.[10]

In the present study fatty change was seen in 28.18% of cases [Fig 2] which is comparable with study done by Selvi et al (26.9%) [11] but Patel et al reported a higher percentage of cases (35.69%).[12]

Fatty change was more common in age group of 31-40 years which is comparable to study done by Patel et al. [12] Selvi et al reported maximum cases of fatty change in age group of 50-70 years of age.[11]

Hepatitis was found in 4 cases (3.64%) in present study. In study by Selvi et al 13.9% of cases of hepatitis, while that of Bal et al hepatitis found in 3% cases. [11,6]

Steatohepatitis was seen in 2.73 %cases. This is comparable with study done by Sotoudehmanesh et al which showed a percentage of 2.1%. [8] Chronic hepatitis was seen in 3.64%cases which is little higher when compared with Sotoudehmanesh et al which showed 2.6%. [8] Shakoori reviewed the report of histology of 4025 liver specimens during a 5-year period. He found a 6.8% prevalence rate for chronic hepatitis but he did not separate steatohepatitis from

chronic hepatitis.[13] So this may be the reason for the large difference.

Cirrhosis is the morphologic change most often associated with chronic liver disease; it refers to the diffuse transformation of the liver into regenerative parenchymal nodules surrounded by fibrous bands [14] It is the irreversible form of liver disease which usually have a slow and insidious process but, in some cases, may develop in 1-2 years. In our study, cirrhosis was seen in 9/110 (8.18%) cases [Fig 3,4,5,6] and all were males Seven out of 9 cases showed micronodularity while remaining 02 cases showed mixed nodularity. Similar results were seen in a study by Majethia NK et al [15] who studied the pattern of liver cirrhosis in 118 autopsy patients. History of alcohol was seen in 83.25% of cases of which 95% were males. Among alcoholics, 48.4% showed micronodularity. Studies by Selvi et al and Bal et al also reported 7.40 % and 14% incidence of cirrhosis respectively. [11,6]

In our study, two cases (1.81%) showed granulomas with giant cells. Liver was part of generalised military tuberculosis. Soutoudehmanesh R et al [8] observed granulomatous hepatitis in only 0.2%, which was lower as compared to our study and 2% cases of hepatic granulomatous lesions were seen in a study by Devi Ph. M et al. [16] Hepatic Tuberculosis of liver occur in 50-80% of patients as a part of generalised military tuberculosis. Liver is a common site of granuloma formation as it has rich blood supply. Primary hepatic tuberculosis is rare because low oxygen tension in liver is unfavourable for growth of mycobacteria.[17] In the study by Cunnigham, et al they have detected granuloma in 2 - 10% of liver biopsies in large series.[18]

Liver necrosis was seen in 0.91%cases [Fig 7] which is much lower than other studies. [12,19]

Autolysed specimen was received in 10%cases which is a significant number as we missed diagnosis due to autolytic changes. Poor preservation which includes inadequate quantity and dilution of formalin, inadequate size of container and sending specimens in normal saline and poor handling of container leading onto spillage of formalin and delay in sending the viscera are the main reasons for autolysis.

All the comparisons of our study with other studies in various histopathological findings of liver are summed up in Table 6.

Limitation:

The limitation of the study is limited sample size and in most of cases only a part of the organ was received for the histopathological study. However, if this shortcoming is overcome, histopathological reporting would be more precise and would help much more to understand the cause of death.

Conclusion:

From our study, we conclude that autopsy specimens of liver help to identify the liver disease patterns, among them the most common findings being congestion followed by fatty change. Liver diseases are more common in males as compared to females and the most affected age group being 31-40 years.

Histopathological study of autopsy specimen helps in identifying various lesions that were undiagnosed. It also gives a valuable information for quality control

of health care system. However, it is an autopsy study, so it does not tell us the actual incidence of various liver diseases in our population. But it will help us in understanding the different pattern of disease.

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