

## Spectrum of Liver Pathology in Autopsy Cases: A Study at Ajmer

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### ABSTRACT

**Background:** It is a known fact that silent liver diseases are common amongst apparently healthy individuals and are sometimes diagnosed only at autopsy. The underlying causes of chronic liver diseases vary in different geographic areas and are based on various factors such as socioeconomic status, life style, diet, local or regional infections, and other endemic diseases.

**Method:** The present study was conducted in the Department of Pathology, J.L.N. Medical College, Ajmer during the period from January 2016 to September 2016 on 200 medico-legal autopsy cases brought to the mortuary. Information regarding age, sex, place and previous history of any disease etc., were collected from the records and from the relatives. The liver specimens from these cases were examined grossly as well as microscopically to establish presence of liver diseases.

**Results:** Satisfactory tissue samples for histologic evaluation were available in all the cases with a mean age of 40.78 years. Males predominated the study with a male: female ratio of 4.4: 1. Normal histology was found in 10 (6.84%) cases. Important findings included congestion in 72 (49.21%), steatosis in 58 (39.72%), chronic hepatitis in 44 (30.13%), steatohepatitis in 12 (18.21%), cirrhosis in 5 (3.42%) cases, hepatic granulomas in 4 (3.8%) cases. Causes of death were: sudden deaths (35.61%), old disease (13.69%), murder (20.53%), insecticide spillage (7.53%), Road traffic accident (5.47%), alcohol poisoning (4.79%), head injury (2.70%).

**Conclusion:** The study was conducted only on specimens collected from the mortuary and may not reflect the actual pattern of liver diseases in the local.

**Keywords:** Autopsy, Liver Disease, Histopathology, Congestion

### Introduction

Liver is vulnerable to a variety of metabolic, toxic, microbial and circulatory insults. Sometimes, the disease is primary while in others the hepatic involvement is secondary to cardiac de-compensation, alcoholism or extrahepatic infections. Quite rightly liver is, called as “the custodian of milieu interior”.<sup>[1]</sup>

The major primary diseases of liver are circulatory disturbances, hepatic steatosis, alcoholic liver diseases and neoplasms. Most of the chronic liver diseases even in advanced stages may cause no prominent clinical signs or symptoms. They either go undiagnosed or are found incidentally during general health check-ups, investigations for other diseases, surgery, or at autopsy.

The main purpose of this study was to analyse different patterns of liver diseases that are reflected in the morphology of the liver at autopsy in Ajmer (Rajasthan) and to compare these patterns with other studies done in different parts of India & world.

### Material and Method

This study was done on the 200 autopsy specimens received in the histopathology section of Department of Pathology,

J.L.N. Medical College, Ajmer during the period of January 2016 to September 2016. Autolysed specimens (20) and specimens without liver (34) were excluded from the study. Rest autopsy specimens (146) irrespective of age, sex and cause of death were included in this study.

Liver specimens were received as a part of multiple viscera from mortuary for pathological examination. Rectangular pieces of liver along with bits of other organs were submitted to the histopathology section for evaluation. After fixation in 10% formalin, sections from representative area were submitted for processing. Sections were stained with H&E stain and other special stains wherever necessary. Different findings of cases were analysed and expressed as frequencies and percentage.

### Results

The study was conducted in the Department of Pathology, J.L.N. Medical College, Ajmer for a period of nine months, from January to September 2016.

The age wise distribution of the cases in the present study was wide from 18 months to 85 years. Mean age was 40.78 years. Maximum liver autopsies were in the age group 31-40 years (27.39%). [Table 1] The male: female ratio in the

present study was 4.4:1 showing preponderance of males ie.33 cases (22.06%). [Fig 1]

In the current study, the most common cause of death was sudden death- 52 cases (35.61%) followed by previously diagnosed chronic diseases -22 cases (13.69%). [Table2] Out of 146 cases, pathological lesions were noted in 136 (93.15%) cases, while in remaining 10 cases (6.84%) no pathology was seen. [Table3]

The most common pathological lesion noted was circulatory disturbances in the form of acute sinusoidal congestion and chronic venous congestion seen in 72 cases (49.31%) followed by steatosis in 58 (39.72%), chronic hepatitis

in 44 (30.13%), cirrhosis in 05 (3.42%), granulomatous hepatitis in 03(2.05%) and liver abscess in 1(0.68%)case. [Fig 2]

Age related changes which were observed in liver included increase in the number of binucleated cells and increased lipofuscin pigment in hepatocytes [Fig 3]. The pathological findings seen in burn cases included focal degeneration and necrosis of hepatocytes, proliferation of kupffer cells showing active phagocytosis. Inflammation, focal/centrilobular necrosis was seen in poisoning cases. Postmortem cases with history of diabetes mellitus showed glycogen vacuoles within nucleus. [Fig 4]

**Table 1: Age Incidence.**

Age Group (Years)	Male (Number)	Female (Number)	Total	
			No.	Percentage
0-10	1	2	3	2.05%
11-20	4	1	5	3.42%
21-30	21	11	32	21.91%
31-40	33	7	40	27.39%
41-50	28	5	33	22.60%
51-60	19	0	19	13.01%
61-70	8	0	8	5.47%
71-80	4	1	5	3.42%
81-90	1	0	1	0.68%
<b>Total</b>	<b>119</b>	<b>27</b>	<b>146</b>	

**Table 2: Cause of Death Distribution.**

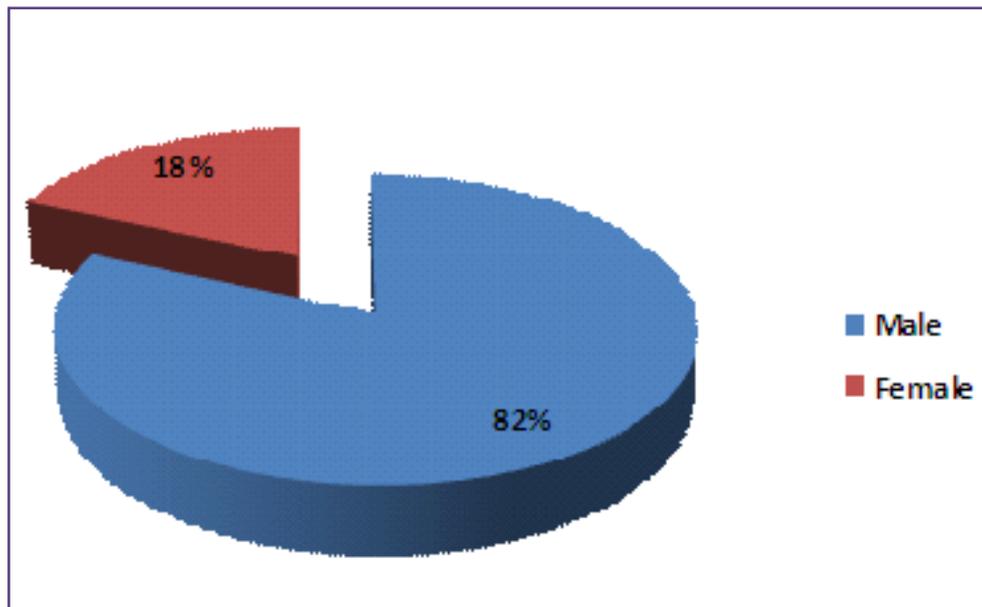
Cause of Death	No. of Cases	Percentage
Sudden Death	52	35.61%
Old disease	22	13.69%
Murder by weapon	18	12.32%
Murder by poisoning	12	8.21%
Insecticide spillage	11	7.53%
Road side accidents	8	5.47%
Alcohol poisoning	7	4.79%
Head Injury	4	2.70%
Hanging	3	2.05%
Snake bite	2	1.36%
Heat Stroke	2	1.36%
Railway track accidents	1	0.68%
Asphyxia	1	0.68%
Electric shock	1	0.68%
Burn	1	0.68%
Pregnancy complications	1	0.68%
<b>Total</b>	<b>146</b>	

**Table 3: Comparison studies in India.**

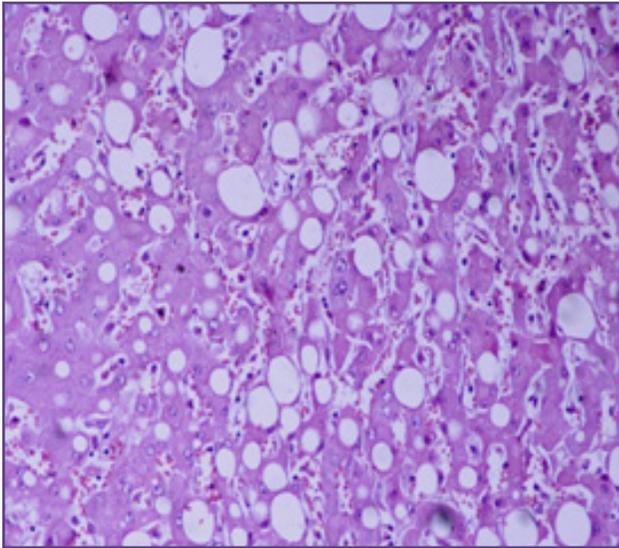
Types of Hepatic Lesion	Salem, Tamil Nadu (Tamil Selvi et al)	Kolar, Karnataka (Umesh Babu R et al)	Imphal, Assam (Ph. Madhubala Devi et al.)	Patiala, Punjab (M.S. Bal et al.)	Solapur, Maharashtra (Smita et al)	2017 Present study
Congestion	16.70%	9.52%	5.00%	9.00%	29.05%	49.31%
Steatosis	26.90%	22.90%	17.00%	30.00%	15.52%	39.72%
Hepatitis	13.90%	20.90%	22.00%	3.00%	21.29%	38.35%
Cirrhosis	7.40%	1.90%	25.00%	14.00%	4.43%	3.42%
Hepatic Granuloma	-	3.80%	-	-	3.10%	2.05%
Hepatic abscess	7.40%	-	-	2.00%	-	0.68%
Tumours	1.90%	-	-	3.00%	2.88%	-
Normal	25.90%	4.76%	11%	30.00%	21.51%	6.84%
Autolysed	-	-	-	-	-	13.69%

**Table 4: Histopathological Findings.**

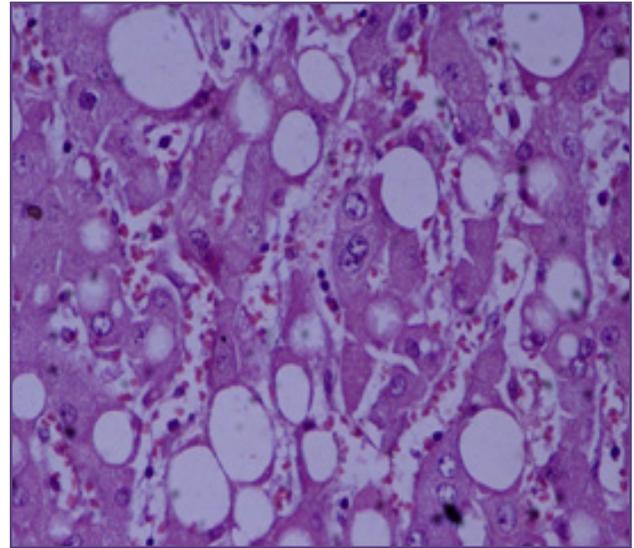
Histopathological Findings	No. of Cases	Percentage
Congestion	72	49.31%
Steatosis	58	39.72%
Steatohepatitis	12	18.21%
Chronic hepatites	44	30.13%
Bile ductular proliferation	7	4.79%
Cirrhosis	5	3.42%
Hepatic granuloma	3	2.05%
Hepatic abscess	1	0.68%
Normal	10	6.84%



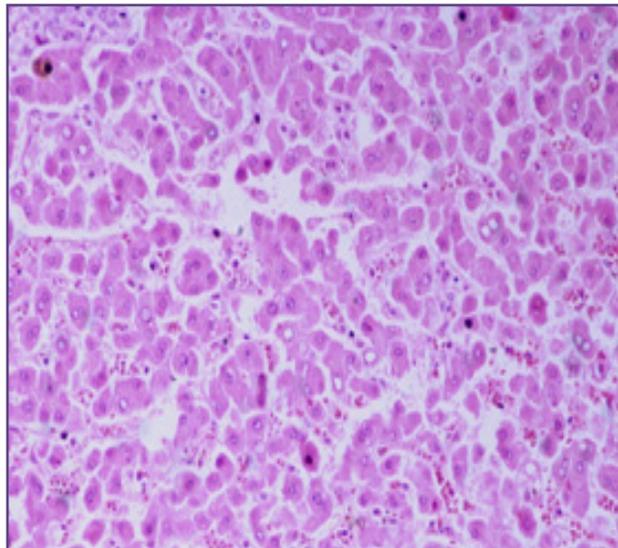
**Fig. 1 : Gender Distribution.**



**Fig. 2: Microphotograph showing diffuse macrovesicular steatosis( H& E stain, 200X).**



**Fig. 3: Microphotograph showing bilobed nucleus in hepatocytes( H& E stain, 400X).**



**Fig. 4 Microphotograph showing glycogen vacuoles within the nucleus of hepatocytes( H& E stain 200X).**

## Discussion

The importance of histopathology in diagnosing liver diseases cannot be overemphasised as some may remain silent and diagnosed only at autopsy. In studies conducted by Bal MS et al<sup>[2]</sup> and Fubara S et al<sup>[3]</sup> it was observed that the commonest affected age group was 41-50 years (53.85%) and 41-49 years (28%) respectively which is comparable to the findings of the present study. Liver diseases predominated in males in the present study which was in concurrence with the findings of several workers<sup>[2-6]</sup> and this may be attributed to the fact that men indulge themselves more to alcohol and smoking as compared to women.

In the study of 4908 autopsy cases from Russia, the most frequent hepatic lesions were Steatosis and Inflammatory disorders.<sup>[7]</sup> Berry in 1500 autopsies performed in the coronal system in South-East London reported Cirrhosis, Adenoma, Metastatic carcinoma and Hamartoma as the most common findings. Space occupying lesions were found in about 5% of livers in that study.<sup>[8]</sup>

Another study based on analysis of 1839 necropsies in Singapore revealed that unanticipated liver lesions are common. The most important ones were cholelithiasis, cirrhosis, and primary carcinoma of the liver.<sup>[9]</sup>

In contrast to these studies conducted abroad, Circulatory disturbances, Steatosis and Chronic hepatitis were frequent hepatic lesions in our study which is quite comparable to studies done in different states of India. [Table 4]

Venous congestion of liver is seen in most of the liver autopsies. The present study revealed circulatory disturbances in the form of acute and chronic venous congestion in 48.9% cases in contrast to 29.05% and 16.7% cases as reported by Smita S et al <sup>[10]</sup> and Tamil Selvi R et al <sup>[5]</sup> in their studies conducted in Solapur (Maharashtra) and Salem (Tamil Nadu) respectively.

Steatosis of liver was a frequent histological finding seen in routine autopsies in association with other histological features or as the only structural abnormality. Umesh R et al <sup>[11]</sup> and Madhubala Devi et al <sup>[12]</sup> found 22.9% and 17% prevalence of steatosis in their studies conducted in Kolar (Karnataka) and Imphal (Assam) respectively, which is comparable with present study (39.72%).

Surprisingly the most common pathological lesion in studies by Madhubala Devi et al <sup>[12]</sup> is Cirrhosis. This is in contrast to other studies in India and present study where Steatosis and Congestion were the common pathological lesions. [Table 4]

Granulomas are frequently encountered in liver biopsies and their existence captures the attention of clinicians and pathologists. <sup>[13]</sup> They are found virtually in all patients with disseminated tuberculosis. <sup>[14]</sup> Drugs are an important cause of otherwise unexplained granulomas. They are sometimes the only or main manifestation of a drug reaction but can also form part of cholestasis or hepatitis picture. In the study by Cunningham et al they have detected granuloma in 2 - 10% of liver biopsies in large series. <sup>[14]</sup>

In our study 2.05% cases showed the presence of hepatic granulomas which is comparable with study by Smita S et al (3.10%) <sup>[10]</sup> and Umesh R et al (3.80 %). <sup>[11]</sup> All cases in present studies were known case of Pulmonary Tuberculosis.

Extra hepatic bacterial infections, particularly sepsis can induce mild hepatic inflammation and varying degrees of hepatocellular cholestasis. In severe cases it may even cause cell necrosis and abscess formation.

Both benign and malignant, epithelial as well as mesenchymal neoplasms arise in liver. Of the malignant tumors, metastatic tumors are more common than primary tumors. But in the present study not a single neoplastic lesion was found.

The difference in frequencies of various lesions in these studies may be due to difference in sample size, age group

and patterns of study. Most of the studies are conducted on bits of liver or whole liver in forensic autopsies who are relatively young subjects and usually in better health conditions and may not reflect the actual pattern of liver diseases in the local population. In more than 70% of the cases the cause of death was acute event. While very few studies included only clinical autopsies done on hospitalized patients and as per clinical interest.

## Conclusion

Finally we conclude that histopathological study of liver is a magnificent learning tool in the hands of pathologists to study the spectrum of liver diseases which is a great value in improving the vision and diagnostic setup for clinical assessment. In our autopsy cases based study chronic venous congestion was the most common liver pathology followed by steatohepatitis. Although autopsy based studies do not reflect the actual pattern of liver diseases but emphasizes the need of further studies for early detection and treatment of vulnerable groups.

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