

**HISTOMORPHOLOGICAL SPECTRUM OF LIVER AND KIDNEY LESIONS IN AUTOPSY CASES**

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**ABSTRACT**

**Objectives:** The main objective of this study was to analyze the findings by the histomorphological spectrum of liver and kidney lesions in autopsies. Histopathological evaluation of autopsy specimens helps to identify organ pathologies and determine the cause of death.

**Methods:** The study was carried out among 230 autopsy cases. All the specimens were fixed in 10% formalin, weight and dimensions were recorded. After tissue processing, paraffin blocks sections were studied from liver and kidney specimens. The histological sections were prepared using H and E Stain and microscopic examination was done. Findings were recorded and statistical analysis was performed.

**Results:** Out of the 230 cases evaluated in the present study, 168 liver specimens and 127 kidney specimens were evaluated. Specimens from males were more common compared to females. Age group of 41–60 was found to be most common. Fatty changes in liver and vascular lesions in kidney were most common lesions found in this study. Incidental findings like granuloma and metastatic tumor deposits were found in liver. Incidental finding of simple renal cyst was found in a case of renal autopsy.

**Conclusion:** The present study shows that most common findings are vascular lesions and fatty change in kidney and liver, respectively. Rare lesions like tumor metastasis are also noted. Granulomatous inflammation and simple renal cyst like incidental findings also noted.

**Keywords:** Kidney, Liver, Autopsy.

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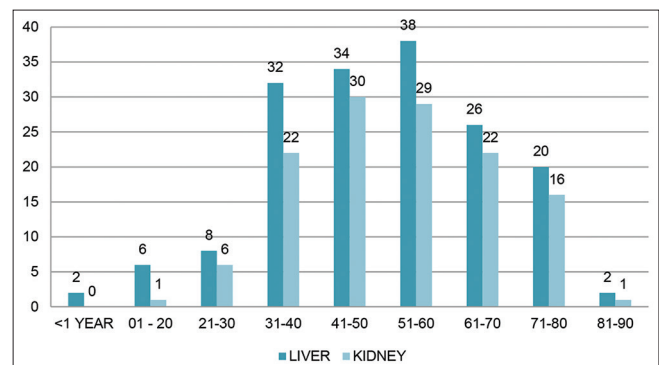
**INTRODUCTION**

Autopsy helps to identify organ pathology and determines the cause and time of death. It is also beneficial to study both the ante-mortem and postmortem aspects of death [1]. Autopsies contribute to pathology knowledge by revealing rare lesions that are a source of learning from a pathologist's perspective. Autopsies also aid in detecting various incidental lesions that would otherwise go unnoticed during a person's life [2,3]. It is also helpful for retrospective quality assessment of clinical diagnoses and as an educational tool for clinicians [4]. Microscopic examination is exceedingly advantageous for studying the disease process [5].

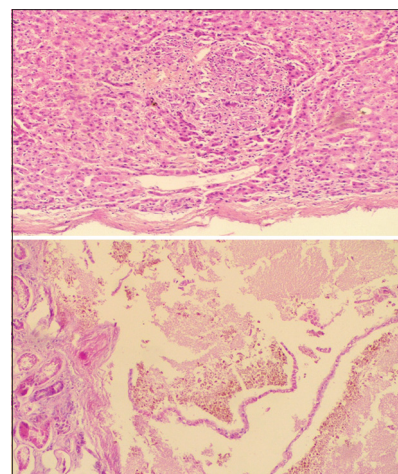
The liver is involved in a variety of inflammatory, neoplastic, and other lesions like metabolic, toxic, microbial, and circulatory insults. In some cases, the disease is primary, whereas, in others, the involvement of the liver is secondary to cardiac decompensation, alcoholism, or extrahepatic infections [6-8]. Even in advanced stages, most chronic liver diseases have no obvious clinical signs or symptoms. They either go undiagnosed or are discovered by chance during routine health checks, investigations for other diseases, surgery, or autopsies [9-11].

Kidney biopsy is usually avoided in critically ill patients; hence, histologic evaluation of autopsy specimen may be the first and only chance to study and diagnose these diseases [12,13]. Kidney functions may be harmed by the following conditions: (a) Obstructive and vascular diseases, (b) infections and inflammatory diseases, (c) interstitial diseases, (d) cystic diseases, (e) neoplasms, and so on [14].

Histologic examination of kidneys at autopsy can aid in the identifying renal lesions and discovering rare lesions [15]. Autopsy cases have revealed a wide range of renal pathology, including diabetic nephropathy, chronic pyelonephritis, acute tubular necrosis, chronic glomerulonephritis, tuberculous inflammation, and many others [16]. The rise in the prevalence of kidney diseases is due to the accumulation of risk factors such as hypertension, diabetes, dyslipidemia, and obesity [17]. The present study was carried out to evaluate various gross and histopathological findings



**Fig. 1: Distribution of cases based on age**



**Fig. 2: Granuloma in liver, simple renal cyst**

in the liver and kidney and to determine the spectrum of liver and kidney diseases among medicolegal autopsy cases.

## METHODS

### Study design

This was a retrospective study.

### Sample size

This study is a time bound study with sample size of 230 cases.

A retrospective study was carried out which included 230 autopsy cases received at Department of Pathology, Hassan Institute of Medical

Sciences, Hassan, Karnataka from June 2018 to May 2022. Age, gender, and clinical history of the deceased were noted from Postmortem note and then gross features were evaluated.

All the specimens were fixed in 10% formalin, weight and dimensions were recorded. After tissue processing, paraffin blocks sections were studied from liver and kidney specimens. The Histological sections were prepared and stained using H and E Stain. Microscopic examination was done and finding was recorded.

The study was conducted after obtaining the permission from ethical committee. Collected data were entered in the MS Excel spreadsheet, coded appropriately, and later cleaned for any possible errors. The statistical analysis was carried out using appropriate statistical software.

**Table 1: Histopathological findings in liver specimens**

Liver pathology	Frequency (%)
Congestion	38 (22.6)
Steatosis	62 (36.9)
Steatohepatitis	7 (4.16)
Chronic hepatitis	3 (1.78)
Cirrhosis	15 (8.93)
Granulomatous inflammation	4 (2.38)
Normal histology	11 (6.54)
Metastatic tumor	1 (0.59)
Autolysis	21 (12.5)
Extramedullary hematopoiesis	5 (2.97)
Massive necrosis	1 (0.59)
Total	168 (100)

**Table 2: Histopathological findings in kidney specimens**

Renal pathology	Frequency (%)
Glomerular lesion	11 (8.66)
Tubular/interstitial lesions	41 (32.28)
Vascular lesions	49 (38.58)
Normal histology	9 (7.09)
Infections	6 (4.72)
Autolysis	10 (7.87)
Simple renal cyst	1 (0.79)
Total	127 (100)

## RESULTS

Out of the 230 cases evaluated in the present study, 168 specimens of liver and 127 specimens of kidney were evaluated. Liver specimens were from 126 males and 42 females. Kidney specimens were from 99 males and 28 females. Age group of 41-60 years was found to be most common in both liver and kidney cases (Fig. 1). On histomorphological evaluation of liver specimens, most common finding was steatosis (36.9%) followed by congestion (22.6%). Granulomatous lesions and metastasis were incidental finding in liver specimens (Table 1).

On histomorphological evaluation of kidney specimens, most common finding was vascular lesions (38.6%) followed by tubular/interstitial lesions (32.3%). We found simple renal cyst in a case of renal autopsy (Table 2 and Fig. 2).

## DISCUSSION

The term autopsy is derived from Greek and it means auto (oneself) and ophis (eye) which is "to see for self." Autopsy helps identify pathologies occurring in the organ and determine the cause and time of death. It is also advantageous to study both the ante-mortem and postmortem aspects of death. In the present study, we evaluated 230 cases. 168 specimens of liver and 127 specimens of kidney were evaluated. Liver specimens were from 126 males and 42 females. Kidney

**Table 3: Comparison of liver autopsy findings in various studies**

Liver pathology	Selvi et al.	Umesh et al.	Patel et al.	Alagarsamy et al.	Smita et al.	Madhubala et al.	Porwal et al.	Kulkarni et al.	Present study
Congestion	16.70	9.52	1.22	26	29.05	5	49.31	16.5	22.6
Steatosis	26.90	22.90	35.69	20	15.52	17	39.72	30	36.9
Hepatitis	13.90	20.90	0.98	10	21.2	22	38.35	7.8	4.16
Cirrhosis	7.40	1.90	2.44	16	4.43	25	3.42	4	1.78
Steatohepatitis	-	32.2	-	-	-	-	-	6.5	8.93
Granuloma	-	3.80	0.49	-	3.10	-	2.05	2.3	2.38
Abscess	7.40	-	-	-	-	-	0.68	2.6	6.54
Tumor	1.90	-	-	-	2.88	-	-	-	0.59
Metastasis	-	-	-	-	-	-	-	-	12.5
Normal	25.90	4.76	56.97	6	21.51	11	6.84	28	2.97
Autolysed	-	-	-	-	-	-	13.69	-	0.59

**Table 4: Comparison of renal autopsy findings in various studies**

Renal pathology	Vaneet et al.	Amandeep et al.	Desai et al.	Khare et al.	Neha et al.	Present study
Glomerular lesions	20	17	18	14.62	71.3	8.66
Tubular and interstitial lesions	41	32	58	22.30	20.6	32.28
Normal histology	27	25	16	16.06	22.90	7.09
Vascular findings	-	26	-	45.80	14.7	38.58
Infections	-	-	-	-	-	4.72
Autolysis	-	-	-	-	-	7.87
Simple renal cyst	-	-	-	-	-	0.79

**Table 5: Comparison of most common age group in various studies**

Studies	Most common age group
Kataria <i>et al.</i>	41-50
Khare <i>et al.</i>	11-30
Desai <i>et al.</i>	41-50
Amandeep <i>et al.</i>	21-40
Sapna <i>et al.</i>	21-40
Neha <i>et al.</i>	41-60
Umesh <i>et al.</i>	30-39
Kulkarni <i>et al.</i>	21-30
Porwal <i>et al.</i>	31-40
Present study	41-60

specimens were from 99 males and 28 females. Forty-one-60 years of age group was found to be most common.

In the present study, we observed steatosis as most common liver lesion which correlated with other studies by Singh *et al.* and Devi *et al.* [18,19]. We observed vascular lesion as most common kidney lesion which was similar to the other studies.

In a study conducted by Selvi *et al.*, they found steatosis as most common liver pathology in liver autopsy specimens. In a study conducted by Umesh *et al.*, they found steatosis as most common liver lesions accounting for 22.90%. In another study conducted by Patel *et al.*, they found that 56% of specimens have normal histology followed by 36% of specimens had steatosis.

In Studies conducted by Smita *et al.* and Alagarsamy *et al.*, they found congestion as most common lesion compared to steatosis [20]. In a study conducted by Madhubala *et al.*, liver cirrhosis is found to be most common. Porwal *et al.* concluded that congestion is most common lesion followed by steatosis. Moreover, a study conducted by Kulkarni *et al.*, they concluded steatosis as most common lesion in liver autopsy specimen (Table 3).

In a study conducted on kidney autopsy specimens by Amandeep *et al.*, they found tubular and interstitial lesions as most common constituting for 41% followed by vascular lesions as 26%.

In another study conducted by Neha *et al.*, they concluded glomerular lesions as most common lesion.

Vaneet *et al.* found tubular and interstitial lesion as most common lesion in kidney autopsy. And a study by Khare *et al.*, they concluded vascular lesion as most common constituting for 45.80% which is correlating with the present study with vascular lesions constituting for 38.58% (Table 4).

In the present study, we found that males cases are more than female cases. Similar gender distribution showing males more than female is found in various other studies like studies conducted by Amandeep *et al.*, Vaneet *et al.*, Desai *et al.*, Khare *et al.*, Neha *et al.*, Selvi *et al.*, Umesh *et al.*, Patel *et al.*, Smita *et al.*, Kataria *et al.*, Kulkarni *et al.*, and Porwal *et al.* Hence, all of the studies found male autopsy more than female autopsy. The present study has 41-60 years age group as most common which is correlating with other studies like study conducted by Neha *et al.* (Table 5).

## CONCLUSION

Histopathological study of liver and renal autopsy specimens helps in establishing the cause of death and also detects incidental lesions. It also acts as magnificent learning tool for pathologist. We concluded that most common findings are fatty liver and vascular lesions in liver and kidney respectively. Hence, this study highlights the importance of autopsy histopathology of liver and kidney specimens.

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## AUTHORS' CONTRIBUTION

All the authors have contributed equally.

## CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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