



“Morphological Spectrum of Kidney Lesions-An Autopsy Study”

Dr.Saniha Pb, Dr.Sowmya Parvathaneni, Dr.Sneha K, Dr.Meena N Jadav

Belagavi Institute Of Medical Sciences, Belagavi-590001, Karnataka, India

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KEYWORDS

Autopsy,
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ABSTRACT:

Introduction: Renal diseases are responsible for great deal of morbidity and mortality. Chronic kidney disease (CKD) is now a global health crisis with prevalence rate of 8-16% world wide. The increased prevalence of kidney disease is a consequence of the accumulation of risk factors such as HTN, DM, dyslipidemia and obesity. The medicolegal autopsy plays an important role in establishment of final diagnosis and determine the immediate cause of death. Histopathological Examination (HPE) of renal tissue in autopsy provides useful information for preventing chronic renal disease that tends to be silent and go undiagnosed.

Objective: To study the morphological spectrum and frequency distribution of renal lesions in autopsy specimens.

Materials and methods: The medico legal autopsy kidney specimens of aged above 18 years received in our Department of pathology from February 2018 to November 2021 were studied. The relevant clinical history and autopsy findings were taken before HPE. Formalin fixed specimen was grossed, processed and sections were stained with routine hematoxylin and eosin stain. Microscopic examinations of all the sections were done by pathologist. Special stains like Periodic Acid Schiff (PAS), Jones Methenamine Silver (JMS), Masson's Trichrome (MT) were done wherever necessary.

Results: The age range of the autopsies was between 22 and 80 years. Out of 55 cases, 41 (74.54%) of the were males, while 14(25.45%) were females. The microscopic findings are of normal histology in 8(14.54%) cases. Out of remaining 47(85.45%) cases which had nephropathological findings, non-glomerular lesions 36(65.45%) were higher than glomerular lesions 9(16.36%). Glomerular lesions included focal segmental glomerular sclerosis-3(5.45%), focal nodular glomerular sclerosis-1(0.55%) and glomerular hyalinisation-3(5.45%) cases. Tubular and interstitial lesions included 6(10.9%) cases of Acute tubular necrosis (ATN), 9(16.36%) Chronic pyelonephritis, 5(9.09%) Chronic pyelonephritis (CPN) with hydronephrosis and 7(12.72%) Chronic interstitial nephritis. In 5(9.09%) cases, simple renal cyst was found as associated findings. Renal arteriosclerosis was observed in 4(7.27%) cases.

Conclusion: Our study provided in-depth data of morphological pattern and frequency distribution of renal lesions in medico legal autopsy specimens. Thus autopsy study has become an indispensable part of medicine which aids in identifying the risk factors, consequences of disease, patient management along with improved patient care and also reduces the mortality due to renal pathology.

1. Introduction

Autopsy study is an essential tool in medicine, because by correlating the gross and microscopic feature of the organs with the clinical features and laboratory findings, the exact cause of death can be known. The autopsy epitomizes clinical based learning and clinicopathologic correlation along with valuable source for HPE including nephropathology. It also provides more accurate

spectrum and frequency of renal disorders. Thus, autopsy aids to the knowledge of pathology by unveiling the rare lesions which are a source of learning for a pathologist.^{2,3} Further autopsy kidney also helps in preventing the mortality due to renal disorders.² Renal diseases were responsible for great deal of morbidity and mortality. The increased prevalence of kidney disease is a consequence of the accumulation of risk factors such as HTN, DM, dyslipidemia and obesity. Chronic Kidney Disease



(CKD) is now recognized as a major global public health crisis with prevalence rate of 8-16% worldwide and acts as an independent risk factor for cardiovascular disease.¹The acute and chronic renal disorders also result in following complications like renal infections, end stage renal disease, cardiovascular accidents, renal osteodystrophy, cognitive decline and anemia.⁶Certain renal pathologies might not affect the renal function without any clinical manifestations. Such asymptomatic disorders was diagnosed by HPE of renal tissue in autopsy which provides useful information for preventing chronic renal diseases.⁷

2. Objectives

- To determine the morphological spectrum of renal lesions in autopsy specimens.
- To analyze the frequency distribution of renal lesions in autopsy specimens.

3. Materials and Methods

Present 3year prospective study was carried out from 2018 to 2021, to review the postmortem cases aged above 18years which were received in the Department of Pathology from Department of Forensic medicine, clinical history and autopsy findings were noted down from the autopsy records.The study included kidney autopsy specimen above 18 years of age .It excluded the specimens which are autolysed and received in parts. Detailed gross examination was done and minimum of six sections were taken. Sections were routinely processed and stained with hematoxylin and eosin. Detailed HPE were done. Special stains like PAS, Methanamine silver, Congo red were done wherever necessary. The microscopic sections for stenosis of renal arteries were graded on the basis of luminal narrowing of arteries and was grade from grade 0 (normal) to grade IV(complete obstruction)Grade 0: normal, Grade I: 1-25% narrowing of lumen, Grade II: 26-50% narrowing of lumen, Grade III: 51-75% narrowing of lumen, Grade IV: 76-100 narrowing of lumen.

4. Results

The study of renal pathology also requires integration of clinical and laboratory data along with light microscopy and electron microscopy.

In critical ill patient the biopsy was avoided, in these cases HPE of autopsy kidneys may be the only opportunity to identify the renal lesions, especially with genetic disease.

The age range of the autopsies was between 22 and 80 years.Out of 50 nephrectomy specimens,40 were males and 10 were females with male to female ratio 4:1.In 3(5.45%) cases, the microscopy findings are of normal histology. The Remaining 47 cases had nephropathological findings at autopsy.

The percentage of nonglomerular lesions 36(65.45%) was higher as compared to that of glomerular lesions 9(16.36%)(Fig 1,2).

In 9(16.36%). cases of renal autopsies, glomerular changes were found. It included focal segmental glomerular sclerosis 3(5.45%)(Fig 7,12),Chronic glomerulonephritis 1(0.55%) and diabetic glomerulosclerosis 5(9.09%)(Fig 9, 11).

The tubular and interstitial findings were observed in 18(34.62%).Out of which 5(9.09%) showed chronic pyelonephritis with hydronephrosis,7(12.72%) were chronic interstitial nephritis,9(16.36%) were chronic pyelonephritis(Fig 3-4,6) and 6(10.9%) were Acute tubular necrosis(Fig 8).5(9.09%) cases of simple renal cyst was found as an incidental finding (Fig 5,10).

Renal arteriosclerosis was observed in 4(7.27%) of cases,out of which 2(1.10%)cases showed Grade 1,1(0.55%) case showed grade II and another Grade III lumen narrowing.

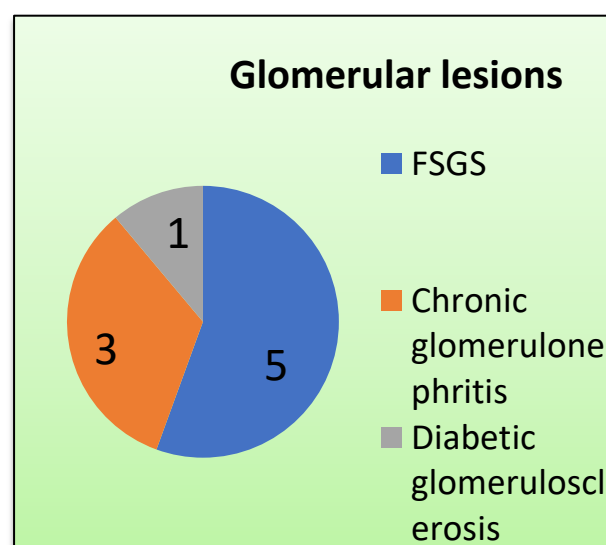


Fig 1:Spectrum of glomerular lesions

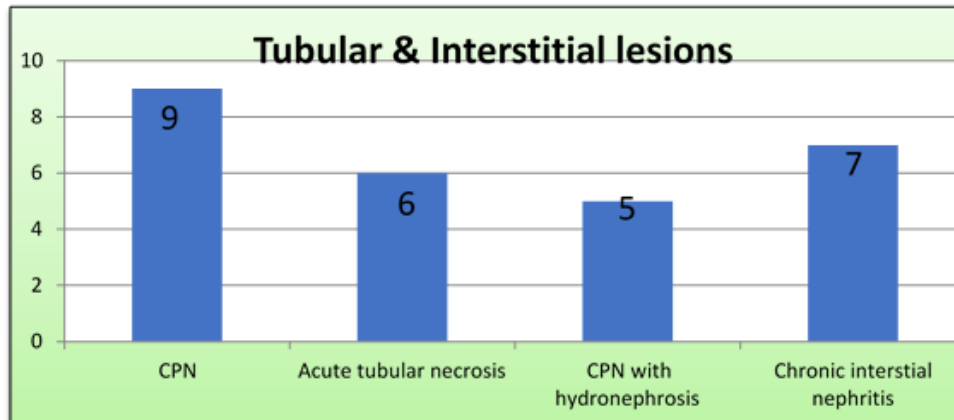


Fig 2: Spectrum of tubulointerstitial lesions

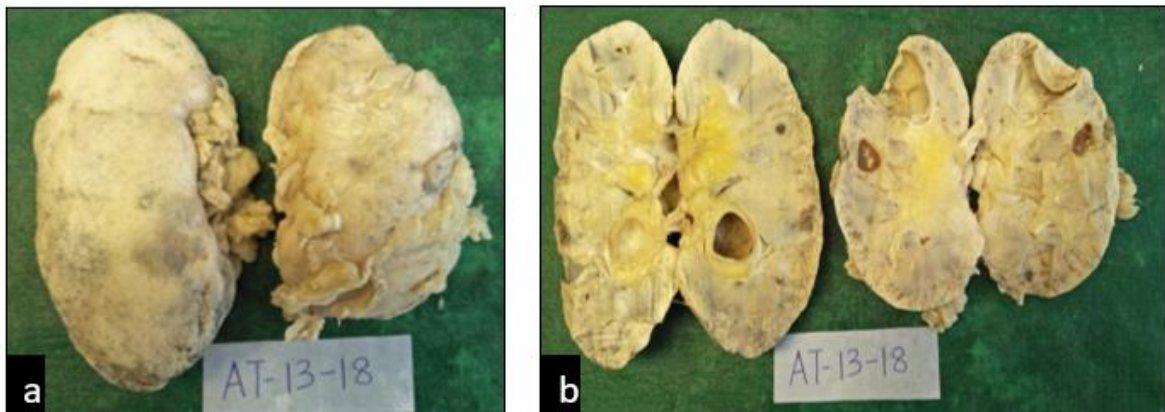


Fig 3: Gross photograph of CPN a) outer surface b) cut section



Fig 4: Gross photograph showing distorted architecture and surface scarring in CPN

Fig 5: Gross photograph of simple cyst

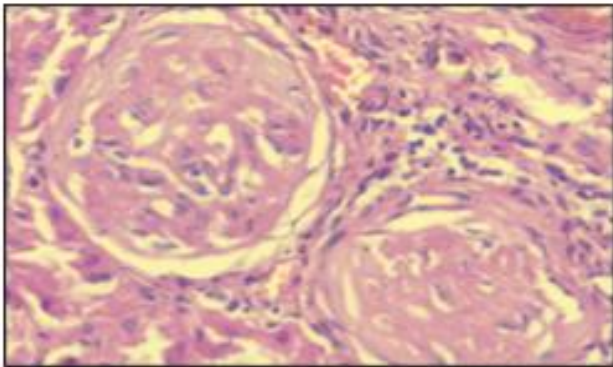


Fig 7:Microphotograph of FSGS

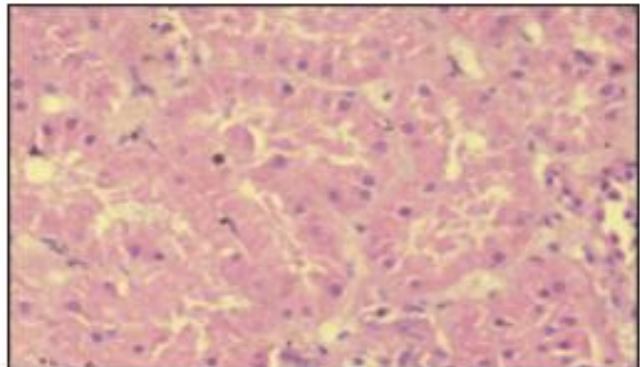


Fig 8:Microphotograph of Acute tubular necrosis

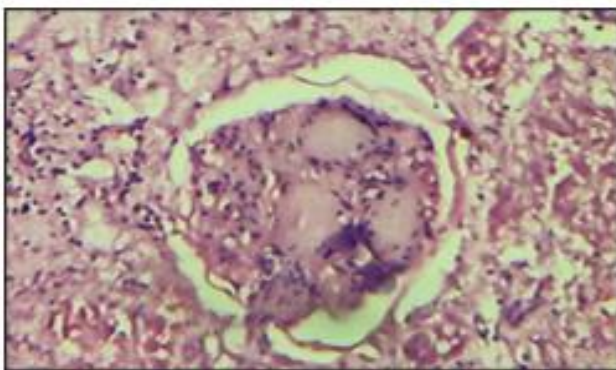


Fig 9:Microphotograph of DN showing KW nodule

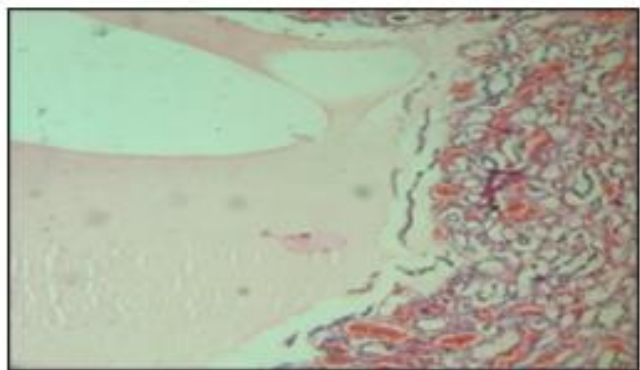


Fig 10:Microphotograph of simple renal cyst

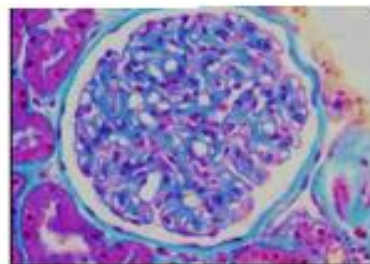
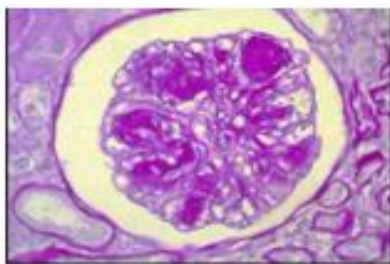


Fig 11:Microphotograph of DN a)PAS b)MT

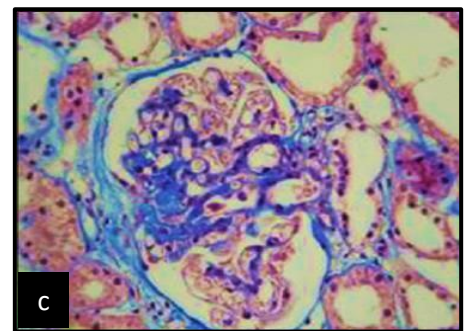
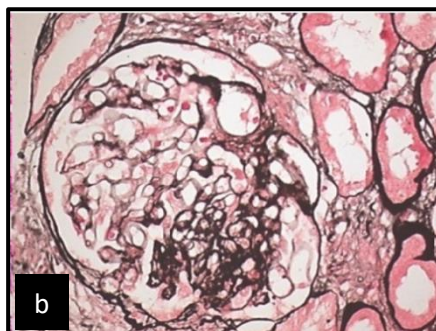
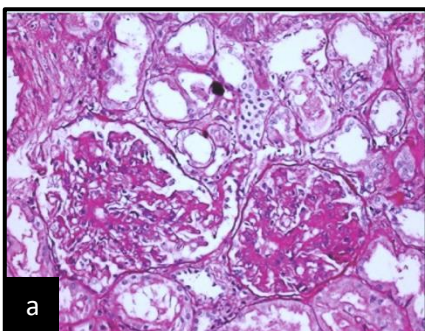


Fig 12:Microphotograph of FSGS a)PAS b)JMS c)MT



5. Discussion

Autopsy remains a valuable tool in understanding limitations of medicine and serves as an important quality assurance indicator of clinical, diagnostic and therapeutic services. Despite the recent diagnostic tools, autopsy has revealed major antemortem diagnostic findings in 30% of cases.^{8,9} Histopathological examination of autopsy has enormous value in improving clinical assessment, and has helped in identifying etiology of more than 80 diseases.^{10,11} It also a useful tool to assess the mortality statistics which play a role in health and treatment planning.¹²

The distribution of renal lesions vary with geographic area, age, gender, environmental, nutritional and genetic factors.

In present study, the most common age group affected was 25-35years, which was in concordance with the study conducted by Amandeep kaur et al⁵ and Sapna et al.²Table 1

The nonglomerular lesions 36(65.45%) was higher compared to glomerular lesion 7(12.72%) in our study. This is in concordance with the study done by

Vanneet kaur et al⁴ and Amandeep et al.⁵ Table 2

Overall most common lesion encountered in the present study was chronic pyelonephritis 9(16.36%) which was in concordant with the studies done by Amandeep et al and Popal et al.

Out of 7(12.72%) glomerular lesion, each 3(5.45%) cases of focal segmental glomerular sclerosis and glomerular hyalinization were found followed by focal nodular glomerular sclerosis. However study conducted by Sandhu et al¹ found 11 cases of focal segmental sclerosis followed by 1 case of basement membrane thickening.

In present study, the most common tubulo-interstitial lesion was 9(16.36%) chronic pyelonephritis followed by 7(12.72%) chronic interstitial nephritis, 6 (10.9%) cases of ATN and 5(9.09%) CPN with hydronephrosis. The study done by Sandhu et al¹ found 6(5%) cases of renal tuberculosis and 8(6.6%) cases of CPN.

Renal arteriosclerosis was observed in 4(7.27%) of cases. Sandhu et al¹ study found 30 cases of Renal arteriosclerosis.

Conclusion:

Our study provided a fair insight into the morphological spectrum of various lesions in autopsy specimens of kidney. The autopsy has remained as important complementary tool for identifying large number of preventable renal lesions and hence can be prevented in future management of patients

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