Original Article

DOI: 10.21276/APALM.1455

Histomorphological Spectrum of Renal Lesion in An Autopsy Study

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ABSTRACT

Background: Autopsy provides normal as well as diseased human tissue for morphologic studies, for establishment of cell and organ culture as well for xenotransplantation. It provides the opportunity to discover new diseases, to evaluate toxic effects of drugs and therapies. The kidneys are often affected by chronic inflammatory lesions, neoplasms , toxic effects of various drugs and metabolic disorders.

Material and Methods: This was a five year study from January 2011 to December 2015 in our department of pathology. The kidneys of medico legal autopsies performed during these years were subjected to our study. After excluding 30 cases of severely damaged tissue, 120 cases of well preserved renal medico legal autopsies were included in our study. The stained microscopic sections were examined by two histopathologists independently.

Results: Seventy five of the 120 autopsies were males, while 45 were females. In 27 (22.5%) cases, the microscopic morphology was close to normal histology. Remaining 93(77.5%) cases had a nephropathological findings The percentage of non glomerular nephropathies (60.8%) was higher as compared to that of glomerular lesions (16%). 20 (16%) cases exhibited glomerular alterations such focal global glomerular sclerosis, segmental glomerular sclerosis, nodular mesangial sclerosis, basement thickening and mesangial cellular proliferation. Tubular and interestium lesions were observed in 34.16% which included acute tubular necrosis, chronic pyelonephritis and tubercular pyelonephritis. Renal arteriosclerosis was observed in 25% cases. Renal cell carcinoma was incidentally detected in1.6%

Conclusion: Our study provided satisfactory data in respect to morphological spectrum of various renal lesions in autopsy.

Keywords: *Autopsy, Renal diseases,*

Introduction

The autopsy data continue to embellish the medical literature; it provides a unique opportunity for physicians to correlate their physical and laboratory findings with the pathologic changes of disease process. The autopsy pathologists uncover the changing patterns of disease. The autopsy aids in the education of students in medicine and other health related disciplines by providing teaching material for anatomy, histology and pathology. Further it plays an important role in establishment of diagnosis and whenever possible determines the possible cause of the death.

Renal diseases are responsible for great deal of morbidity. Chronic kidney disease is now recognized as a major global public health problem and is an independent risk factor for cardiovascular disease.[1-2]CKD affects 10-15% of the adult population worldwide.[3-4]The increased prevalence of kidney diseases is a consequence of the accumulation of risk factors such as hypertension, diabetes, dyslipidaemia and obesity.[5]Pathologic examination of renal tissue in autopsy throws a light on renal histologic changes in the general population, might provide useful information for preventing chronic renal diseases that tend to be asymptomatic and often go undiagnosed.

The aim of the present study was to analyze varied spectrum of renal lesions detected on autopsy.

Material and Methods

This was a five year study from January 2011 to December 2015 in our department of pathology. The kidneys of medico legal autopsies performed during these years were subjected to our study. After excluding 30 cases of severely damaged tissue, 120 cases of well preserved renal medico legal autopsies were included in our study. The data pertaining to age, gender, and clinical findings were recorded from deceased post mortem papers. The thorough gross examination including weight, measurements, colours were recorded and then tissue was fixed in 10% neutral buffered formalin. The formalin fixed tissues were sampled, each sample included the cortico-medullary region then were further processed by automatic processor. The three micrometer thick sections were obtained from paraffin embedded tissue samples and were histochemically stained with haematoxylin and eosin. The special stains periodic acid Schiff reagent and silver methanamine were

done as and when required. The microscopic sections were observed by two histopathologists indepentantly. The 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.

Results

The age range of the autopsies was between 25 and 80 years. Seventy five of the 120 autopsies were males, while 45 were females. In 27(22.5%) cases, the microscopic morphology was close to normal histology. Remaining 93(77.5%) cases had a nephropathological finding at autopsy. Table 1 summarizes the various renal lesions in renal autopsies. The percentage of non glomerular nephropathies (60.8 %) was higher as compared to that of glomerular lesions (16%).

Glomerular Findings: In 20 cases of renal autopsies glomerular alterations were observed of which 12 males and remaining 8 were were females. Ten cases (8.3%) exhibited focal global sclerosis. There were two cases (1.6%) of segmental glomerular sclerosis and three (2.5%) cases exhibited nodular glomerular sclerosis. Basement membrane thickening was observed in two (1.6%) cases. Three (2.5%) cases showed moderate degree of mesangial cellular proliferation.

Tubular and Interestium Findings:. There were tubular and interestium alterations in 41(34.16%) cases of which 29 were males and twelve were females. Acute tubular necrosis was seen in 27(22.5%) cases of renal autopsies fig1. The chronic pyelonephritis fig2 was noted in 8 (6.6%) cases out which 5 cases had diffuse interstitial fibrosis, tubular atrophy and diffuse global sclerosis. Remaining three cases had focal interstitial inflammation with focal tubular atrophy fig 3. In addition to chronic pyelonephritis three were accompanied by hydronephrosis and two cases had nephrocalcinosis. The tubercular pyelonephritis was observed in 6 (5% cases) of renal autopsies. The caseating epitheloid cell granulomas, langhan type of giant cells were noted in cases of tuberbular pyelonephritis fig 4 and fig 5. The Ziehl Neelson stain exhibited acid fast bacilli.

Vascular Findings: The most frequent histological diagnosis was renal arteriolosclerosis observed in 30 (25%) of renal autopsies, of which 20 were males and 10 were females. Grade II renal arteriolosclerosis was observed in 18 (60%) cases followed by Grade I renal arteriolosclerosis in 6 (20%), Grade III in 4 (13.3%) and remaining had grade IV renal arteriolosclerosis 2(6.6%). The arterial nephrosclerosis was characterized by intimal fibrous thickening of arteries fig [6]

The incidental renal masses in the study comprised of clear cell renal cell carcinoma in two renal autopsies, of which one was 65 year old male and other being 55 year old female.

Table 1: Distribution of various renal findings on autopsy study (120).

Histopathological findings	Number	Gender M F
A.Glomerular lesions	20(16.6%)	12 8
1.Focal global glomerular sclerosis	10 (8.3%)	7 3
2.Segmental glomerular sclerosis	2 (1.6%)	1 1
3.Nodular glomerular sclerosis	3 (2.5%)	2 1
4.Mesengium proliferation	3(2.5%)	1 2
5.Basement membrane thickening	2 (1.6%)	1 1
B. Tubular and Interstitial findings	41(34.16%)	29 12
1.Acute tubular necrosis	27(22.5%)	20 7
2.Chronic pyleonephritis	8(6.6%)	5 3
3.Tubercular pyleonephritis	6(5%)	4 2
C. Vascular findings	30 (25%)	20 10
1. Renal arteriosclerosis	18(60%)	15 3
a.Grade II	6 (20%)	2 4
b.Grade III	4(13.3%)	2 2
c.Grade I	2(6.6%)	1 1
d.Grade IV		
D.Neoplasm		
1.Renal cell carcinoma	2 (1.6%)	1 1
E.Normal histology	27(22.5%)	13 14
Total	**120**	**75 45**

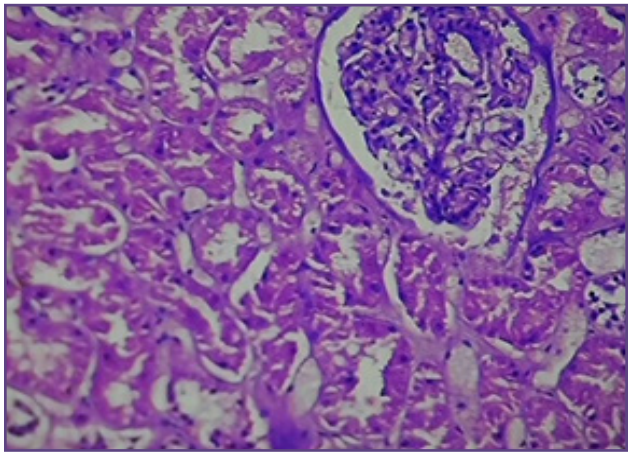

Fig. 1: Sections shows a viable glomerulus with tubular epithelial cells exhibiting necrosis in case of Acute tubular necrosis H& E x 40.

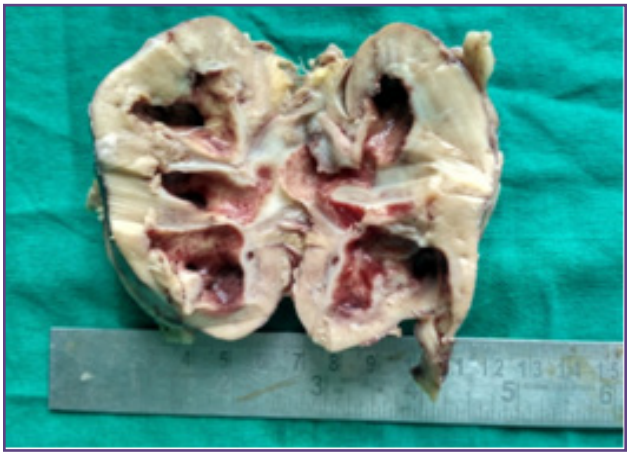

Fig. 2: Gross appearance of a kidney from a case of chronic pyleonephritis shows dilation and blunting of pelvic calyces.

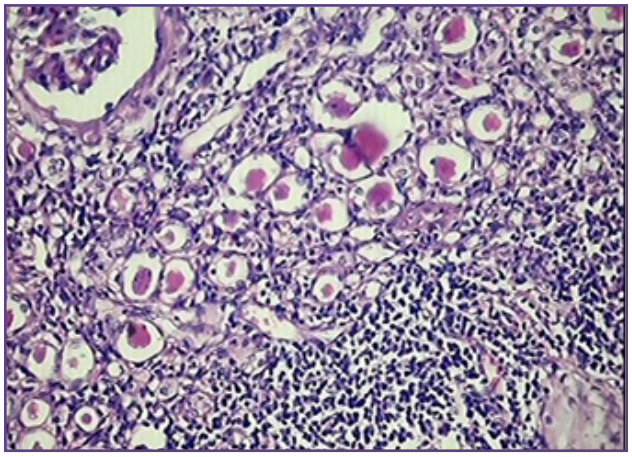

Fig. 3: Sections shows dense inflammatory infiltrate in the interestium with thyroidization of tubules in case of chronic pyleonephritis H& E x 40.

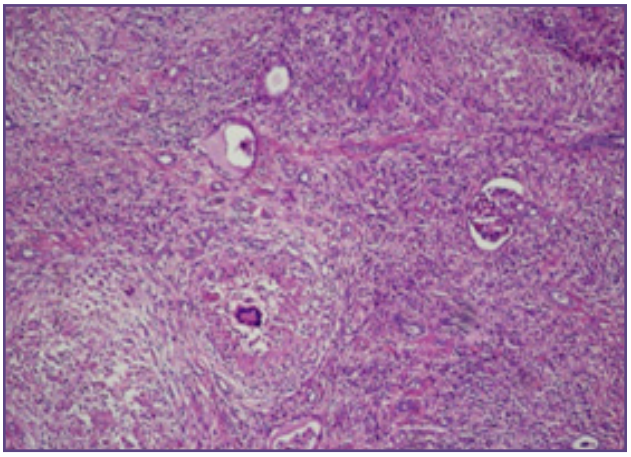

Fig. 4: Sections show epitheliod cell granulomas in the interestium in case of tuberbular pyleonephritis H& E x 10

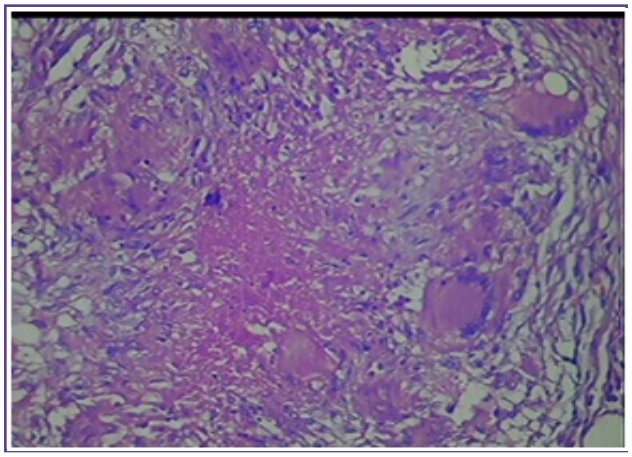

Fig. 5: High power view of caseating epitheloid cell granulomas in case of tubercular pyleonephritis H & E x 40

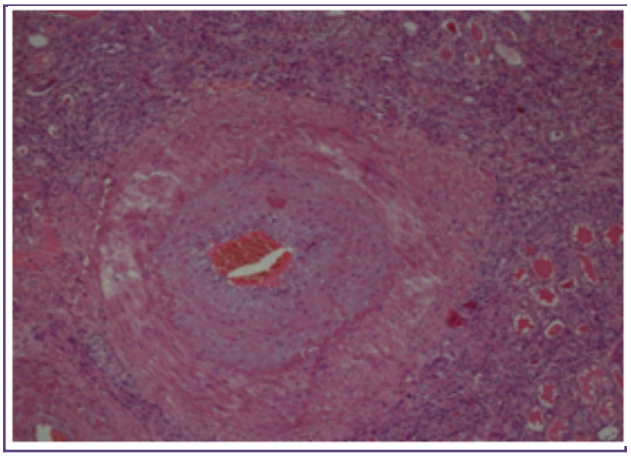

Fig . 6: Sections show renal artery exhibiting arteriosclerosis with thickening of the wall and narrowing of the lumen H& E 10

Discussion

The distribution of renal lesions vary with geographic area, age, gender, environmental, nutritional and genetic factors.[6-7] In current analysis in 27 cases the microscopic findings were close to normal histology. This is in concordance with study conducted by Usta et al.[8] on 55 renal autopsy in which 23 cases exhibited almost normal histology. We observed nephropathological changes in 77.5% of renal autopsies .How ever slightly lower percentage of renal lesions were obtained by Monga et al.[9] and Martinez et al.[10] in their respective work on renal autopsies who found renal lesions in 68% and 59% cases respectively. The histopathologic findings in the present study revealed presence of non glomerular nephropathies in 73(60.8%) cases and glomerular lesions 20(16%) cases .A study conducted by Hailemariam S et al.[11] on 237 autopsies observed presence of glomerular or vascular pathology in 28% ,non glomerular lesion in 33% and 29% had combined lesions.

We observed glomerular sclerosis in 20 (16.6%) cases of which 10 (8.3%) cases exhibited global focal glomerular sclerosis, two (1.6%) cases had segmental glomerular sclerosis, three (2.5%) cases had nodular sclerosis, three(2.5%) cases had moderate to severe degree of mesangial cellular proliferation and two (1.6%) case had basement membrane thickening. However Usta et al.[8] in their work observed focal global sclerosis in eleven cases, followed by 12 cases of mesangial cellular proliferation and one case of basement membrane thickening.

In current analysis 30 (25%) cases exhibited renal arteriosclerosis .Mc Namara BJ et al.[12]in their work on 81 renal autopsies reported arteriolar nephrosclerosis in 34% cases . Nephrosclerosis at autopsy is associated with increasing age and is more frequent in blacks than whites. [13] Some observers suggest that renal arteriosclerosis is strongly linked with hypertension.[14-16]

Among present work tubular and interstitium changes were observed in 41 (34.16%) cases of which27 (22.5%) cases had acute tubular necrosis .This might be attributed to death due to intake of toxic substance, drugs over dose and snake bite. Renal tuberculosis and chronic pyelonephritis were observed in 6 (5%) and 8 (6.6%) of cases respectively in our work. Tuberculosis has been described as a global emergency by WHO and in developing countries it still remains as a major cause of morbidity and mortality. [17] Renal tuberculosis develops in approximately 5 % of patients with active tuberculosis. Renal tuberculosis usually remains clinically silent and often detected incidentally in autopsy studies.[18]

Two (1.6%) cases of renal cell carcinoma (clear cell type) were observed during our study. Kozlowska Jolanta et al.[19] in their work observed renal tumors in 2.76% cases in post mortem examination. Shah VB et al.[20] and Sapna P et al.[21] in their respective autopsy studies revealed 5 cases and 4 cases of renal masses detected incidentally.

Conclusion There is still no substitute for autopsy study which throws immense light on pathogenesis of disease, reveals hazardous effects of therapies and drugs administered and lastly often reveal cause of death. The present study on renal autopsies showed renal vascular and tubulointerstitial lesions outnumbered in comparison to glomerular lesions. We observed 1.5% cases of renal cell carcinoma. Our study provided satisfactory data in respect to morphological spectrum of various renal lesions in an autopsy study however it does not reflect the actual incidence of renal lesions in a population.

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Financial or other Competing Interests: None.

Date of Submission : 02.04.2017
Date of Acceptance : 25.05.2017
Date of Publication : 31.08.2017