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Original Article

Kidney Lesions in an autopsy: 3-year study in a Tertiary Health care Hospital

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Abstract
Objectives: *The Main aim of the present study is to analyse the spectrum of renal lesions detected on Post mortem.*
Material and Method: *This was a prospective 3-year study from January 2016 to December 2018 in our department of pathology. The kidneys of post-mortem autopsies performed during these years were subjected to our study. After excluding 14 cases of severely damaged and autolysed tissue, 550 cases of well-preserved renal post-mortem autopsies were included in our study. The stained microscopic sections were examined.*
Results: *374 of the 550 autopsies were males, while 186 were females. In 117 (21.27%) cases, the microscopic morphology was close to normal histology. Remaining 433 (78.7%) cases had a nephropathological findings. The percentage of non-glomerular nephropathies (55.04%) was higher as compared to that of glomerular lesions (14.17%). 78 (14.17%) cases exhibited glomerular alterations such glomerular sclerosis and glomerulonephritis. Tubular and interstitial lesions were observed in 180 cases (30.90%) which included acute tubular necrosis, chronic pyelonephritis, tubular haemorrhages and interstitial nephritis. Renal arteriosclerosis was observed in 125 (22.7%) cases. Other lesions such as simple cyst, nephrolithiasis, end stage kidney diseases and cloudy change comprised of 57 cases (0.9%) Renal cell carcinoma was incidentally detected in 3 cases (0.54%).*
Conclusion: *Our study provided satisfactory information in respect to morphological spectrum of various renal lesions in autopsy.*

Introduction

The term "autopsy" is derived from the Ancient Greek word autopsia, means "to see for oneself", autos ("oneself ") and opsis ("eye").[1,2] Autopsy aids to the knowledge of pathology by unveiling the rare lesions which are a source of learning from a pathologist's perspective Some of them are only diagnosed at autopsy as they do not cause any functional derangement.[3] Kidneys are the vital organs of the body which are having multiple functions. Their main function is not only excretion but they also maintain water and salt metabolism along with acid base balance, they are going to maintain the blood pressure through renin angiotensin mechanism and haematopoiesis by producing erythropoietin.[4]

Histologic evaluation of autopsy kidneys may be the first opportunity to identify renal lesions. A wide spectrum of renal pathology in adult autopsies including diabetic nephropathy,

thrombotic microangiopathy, glomerulonephritis (often infection-related), vasculitis, amyloidosis, light chain cast nephropathy, membranous nephropathy, focal segmental glomerulosclerosis, atheroembolic disease, polyomavirus nephropathy, bile cast nephropathy, oxalosis, nephrocalcinosis, and urate nephropathy have been encountered.[5]

Chronic kidney disease is now recognized as a major global public health problem and is an independent risk factor for cardiovascular disease. [6-7] Chronic Kidney Disease affects 10-15% of the adult population worldwide.[8-9] The increased prevalence of kidney diseases is a consequence of the accumulation of risk factors such as hypertension, diabetes, dyslipidaemia and obesity.[10]

Aims and Objectives

The Main aim of the present study is to analyse the spectrum of renal lesions detected on autopsy.

Material and Methods

This was a prospective 3 study from January 2016 to December 2018 in the department of pathology, Dr. Shankarrao Chavan government medical college, Vishnupuri, Nanded. The kidneys of medico legal autopsies performed during these years were subjected to our study. After excluding 14 cases of severely damaged and autolysed tissue, 550 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. A minimum of two sections per kidney were studied. All the histological sections were stained in H & E stain & mounted. All the histological sections were examined microscopically & findings were recorded and tabulated.

Results

In our study, males constituted 68 percent (374 cases) and females, 32 per cent (176 cases), hence, the male to female ratio was 2.12:1 [Table 1]. The highest percentage of patients belonged to the age group of 20-40 years. The youngest patient was 1 day old and the oldest patient was 90 years old.

Table 1: Gender Distribution of Kidney Diseases

Gender	No. Of Cases
Males	374 (68%)
Females	176 (32%)
TOTAL	550

Table 2: Spectrum of Kidney Diseases

Histomorphological Finding	Number of cases
I. Glomerular lesion: • Glomerulosclerosis	**78 14.17%**68 (12.36%)
• Glomerulonephritis	10 (1.81%)
II. Tubular Lesions: • Tubular Haemorrhage	**30.90%**30 (5.45%)
• Tubular Necrosis	10 (1.81%)
• Pyelonephritis	95 (17.27%)
• Interstitial Nephritis	35 (6.36%)
III. Vascular Lesion: Renal arteriosclerosis	**22.7%** 125 (22.7%)
IV. Renal cell carcinoma	3 (0.54%)
V. Others: • Simple Cyst	**56 0.9%**3 (0.54%)
• Nephrolithiasis	1 (0.18%)
• End Stage Kidney Disease	1 (0.18%)
• Cloudy Change	52 (**9.45%**)
VI. Normal Histology	117 (**21.27%**)

- In 117 (21.27%) cases, the microscopic morphology was close to normal histology.
- Remaining 433 (78.7%) cases had a nephropathological findings.
- The percentage of non-glomerular nephropathies (55.04%) was higher as compared to that of glomerular lesions (14.17%).
- 78 (14.17%) cases exhibited glomerular alterations such glomerular sclerosis and glomerulonephritis.
- Tubular and interstitial lesions were observed in 180 cases (30.90%) which included acute tubular necrosis, chronic pyelonephritis, tubular haemorrhages and interstitial nephritis.
- Renal arteriosclerosis was observed in 125 (22.7%) cases.
- Other lesions such as simple cyst, nephrolithiasis, end stage kidney diseases and cloudy change comprised of 57 cases (0.9%)
- Renal cell carcinoma was incidentally detected in 3 cases (0.54%).

Table 3: Male to Female ratio in Kidney Lesions

Histomorphological Finding	Male	Female
I. Glomerular lesions:		
• Glomerulosclerosis	45 (66.17%)	23 (33.82%)
• Glomerulonephritis	6 (60%)	4 (40%)
II. Tubular Lesions:		
• Tubular Haemorrhage	21 (70%)	9 (30%)
• Tubular Necrosis	4 (40%)	6 (60%)
• Pyelonephritis	73 (76.84%)	22 (23.15%)
• Interstitial Nephritis	28 (80%)	7 (20%)
III. Vascular Lesions: Renal arteriosclerosis	105 (84%)	20 (16%)
IV. Renal cell carcinoma	2 (66.67%)	1 (33.34%)
V. Others:		
• Cloudy Change	27 (53.15%)	24 (46.84%)
• Simple Cyst	2 (66.67%)	1 (33.34%)
• Nephrolithiasis	1 (100%)	0
• End Stage Kidney Disease	1 (100%)	0
VI. Normal Histology	103 (85.83%)	17 (14.16%)

Table 4 Age Incidence in Kidney Lesions

Histomorphological Finding	0-20 yrs.	21-40 yrs.	41-60 yrs.	>60yrs.
I. Glomerular lesion:				
• Glomerulosclerosis	4 (5.88%)	22 (32.35%)	25 (36.76%)	17 (25%)
• Glomerulonephritis	0	2 (20%)	6 (60%)	2(20%)
II. Tubular lesion:	0	8 (44.45%)	9 (50%)	2 (11.2%)
• Tubular Haemorrhage				
• Tubular Necrosis	0	2 (40%)	3 (60%)	0
• Pyelonephritis	1 (1.42%)	13 (18.57%)	36 (51.42%)	22 (31.42%)
• Interstitial Nephritis	1 (5.55%)	7 (38.89%)	6 (33.34%)	4 (22.23%)
III. Vascular Lesion: Renal arteriosclerosis	8 (6.4%)	67 (53.6%)	35 (28%)	15 (12%)
IV. Renal cell carcinoma	0	0	2 (66.67%)	1 (33.34%)
V. Others:	13 (11.7%)	28 (25.22%)	51 (45.94%)	19 (17.18%)
• Cloudy Change				
• Simple Cyst	1 (33.34%)	0	1 (33.34%)	1 (33.34%)
• Nephrolithiasis	1 (100%)	0	0	0
• End Stage Kidney Disease	0	0	1 (100%)	0
VI. Normal Histology	29 (24.17%)	45 (37.5%)	39 (32.5%)	7 (5.83%)

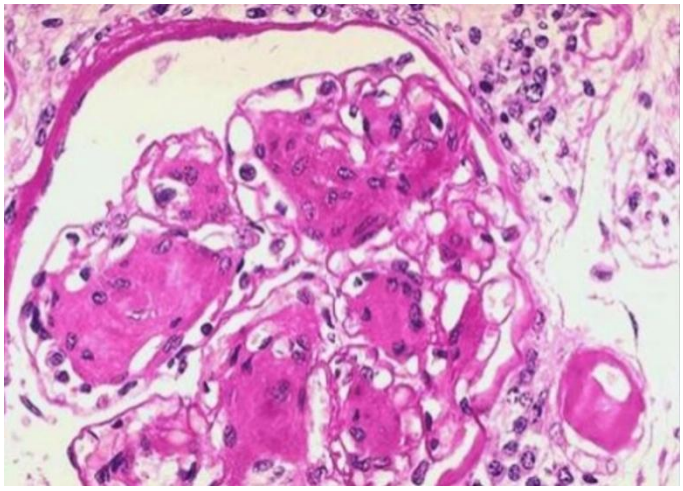

Figure 1: 400x Mgn: PAS positive staining in glomerulosclerosis

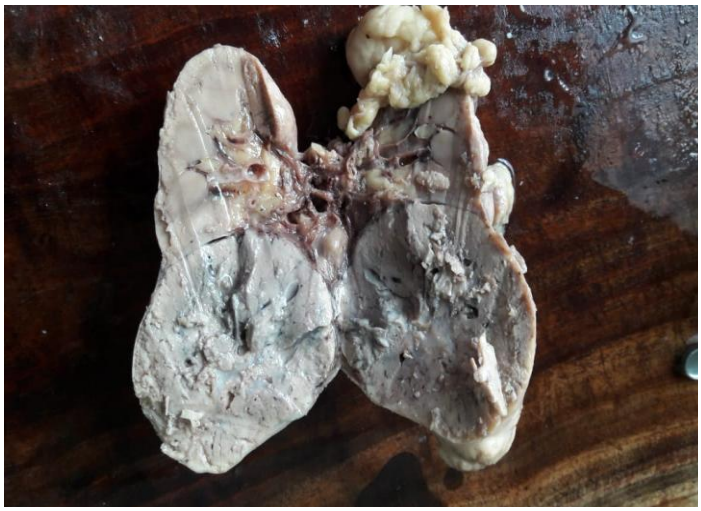

Figure 2: Chromophobe Renal Cell Carcinoma; Tumor in the lower pole of the kidney

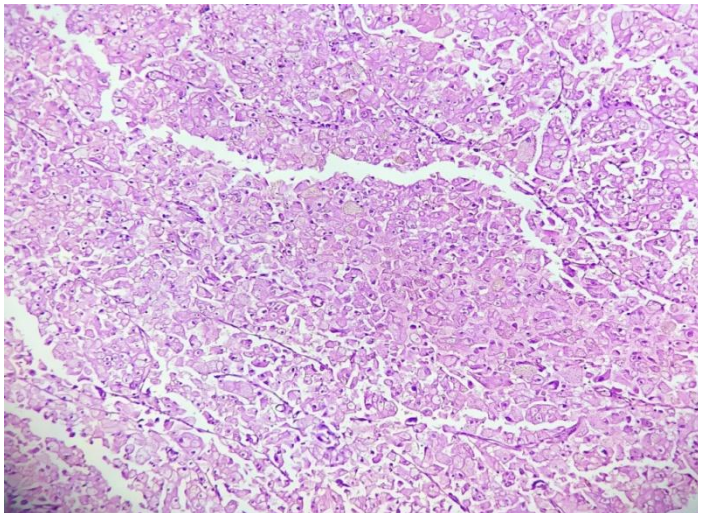

Figure 3: Chromophobe Renal Cell Carcinoma; (100x Mgn) Tumor cells arranged in solid sheet like pattern

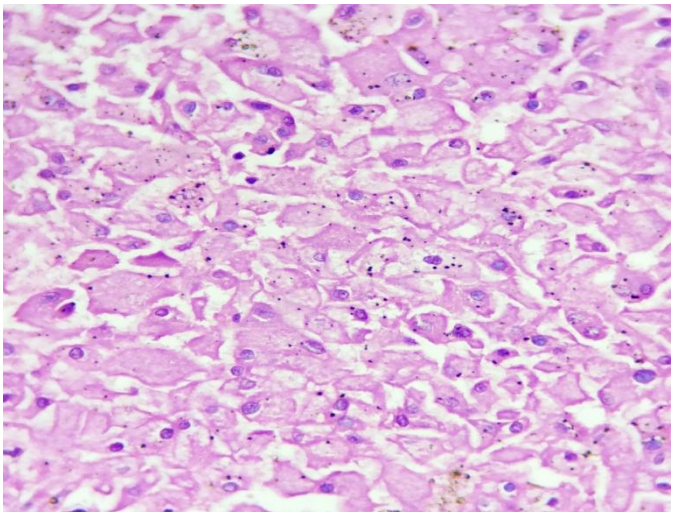

Figure 4: Chromophobe Renal Cell Carcinoma; (400x Mgn) Pleomorphic tumor cells with small nuclei with perinuclear halo and abundant eosinophillic granular cytoplasm

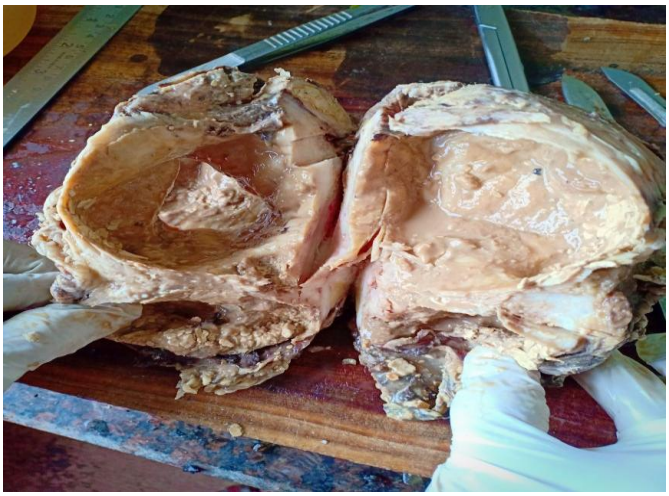

Figure 5: Squamous Cell Carcinoma; Extensive destruction of the kidney architecture with pus like fluid on the cut section along with growth and a little residual renal parenchyma

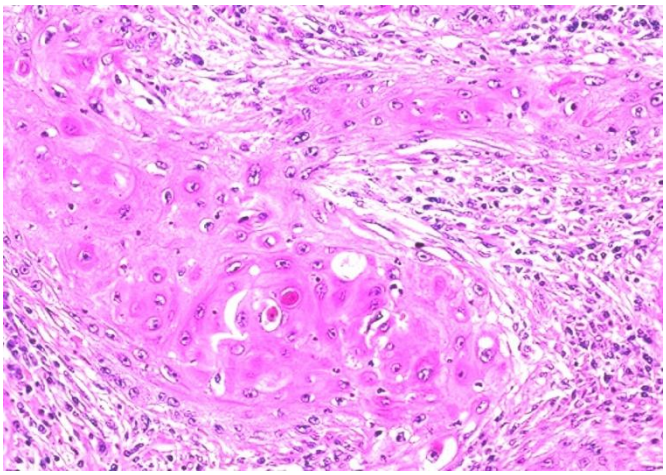

Figure 6: Squamous Cell Carcinoma; (400x Mgn) Moderately differentiated tumor with formation of ketatin pearls.

Discussion

The distribution of renal lesions vary with geographic area, age, gender, environmental, nutritional and genetic factors.[11,12]

Table 5: Comparable study of the age incidence

S.No.	Study	Age Group
1.	Sapna et al (2016)	21-40
2.	Amandeep et al(2018)	21-40
3.	Present Study	21-40

Study by Sapna et al[13] and Amandeep et al[14] showed maximum number of cases between 21-40 years of age. This is in concordance with our study in which maximum number of deaths with renal lesions occurred in 21-40 yrs. of age.

Table 6: Comparison of percentage of normal histology in various studies

S.No.	Study	Age Group
1.	Vaneet et al (2017)	27 out of 120 cases (22.5%)
2.	Amandeep et al (2018)	25 out 0f 100 cases (25%)
3.	Present Study	117 out of 550 cases (21.27%)

In current analysis in 117 (21.27%) cases the microscopic findings were close to normal histology. This is in concordance with study conducted by Vaneet et al.[15] on 120 renal autopsy in which 27 cases (22.5%) and Amandeep et al[14] showing25 out of 100 cases (25%) exhibiting almost normal histology.

The histopathologic findings in the present study revealed presence of non-glomerularnephropathies in 472(85.81%) cases and glomerular lesions 78(14.17%) cases. A study conducted by Hailemariam S et al[16]on 237 autopsies observed presence of glomerular or vascular pathology in 28%, nonglomerular lesion in 33% and 29% had combined lesions.

We observed glomerular sclerosis in 68 (12.36%) cases. However, Usta et al.[17]in their work observed focal global sclerosis in eleven out of 55 cases, (20%).

In the present study, tubular and interstitium changes were observed in 170 (30.90%). This might be attributed to death due to intake of toxic substance, drugs over dose and snake bite. This is in concordance with study conducted by Vaneet et al.[15] in which 41 out of 120 cases (34.16%) showed tubular and interstitial changes.

Three (0.54 %) cases of renal cell carcinoma were observed during our study. Kozlowska Jolanta et al.[18] in their work observed renal tumors in 2.76% cases in post mortem examination.

Conclusion

There is still no substitute for autopsystudy which throws immense light on pathogenesis of disease, 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 information in respect to morphological spectrum of various renal lesions in autopsy.

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