Histomorphological Spectrum of Renal Diseases: A Prospective Study for A Period of Two Years

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ABSTRACT

Introduction: Kidneys are vital organs of the body with multiple functions like excretory, acid base balance and maintenance of blood pressure. Renal parenchyma is mostly subjected to noxious insults but is last to respond. Simple nephrectomy is done for irreversibly damaged kidney. Most common indication for nephrectomy is chronic pyelonephritis. Aim of the study is to analyze the histopathological patterns of renal lesions and to analyze age and sex distribution.

Materials and Methods: The study included a total number of 70 cases, during a period of 2 years i.e., from October 2017 to September 2019. All renal biopsies and nephrectomy specimens received in pathology department, SVS Medical College, Mahabubnagar, Telangana, India were included in the study.

Results: In our study, 70 cases were analyzed. Out of which majority of the lesions (25.7%) were in the age group of 21-40 years and showed male preponderance (68.5%). Present study showed chronic pyelonephritis being the most common non-neoplastic lesion. Among malignant tumors renal cell carcinoma was most common.

Conclusion: The present study reveals various histological patterns of lesions in renal biopsies and nephrectomy specimens. Our study reveals that non-neoplastic lesions are more commonly encountered lesions.

Keywords: Chronic Pyelonephritis, Renal Cell Carcinoma, Malignant Tumor.
Among all the renal lesions, non-neoplastic lesions (n=57; 81.42 %) were more common than the neoplastic tumors (n=13; 18.58 %). Out of 57 cases, maximum number of non-neoplastic cases (n=14; 24.30%) were found to be chronic pyelonephritis with hydronephrosis followed by membranous nephropathy (n=10; 14.30%). Few cases of diffuse proliferative glomerulonephritis, benign nephrosclerosis, Lupus nephritis and Focal segmental glomerulosclerosis were diagnosed (Table 3).

In this study, membranous nephropathy was most common among glomerular lesions. Chromophobe Renal cell carcinoma was the most common malignant tumor followed by clear cell renal cell carcinoma and mucinous tubular renal cell carcinoma. Benign tumors like renal oncocytoma and angiomyolipoma were diagnosed with equal incidence (2.85%) (Figure 1 & Figure 2).

**Discussion**
In the present study, 70 cases were analyzed. Most common age group was 3rd to 4th decade. This is in concordance with the studies done by Muhammad et al., and Kishore H Suryawanshi et al.[7,8] This is variable with other studies done by Shanmuga Swamy et al and Swarnalatha Ajmera.

### Table 1: Age wise distribution of renal lesions.

| Age group    | No of cases | Percentage |
|--------------|-------------|------------|
| 0-10 Years   | 1           | 1.43 %     |
| 11 – 20 Years| 5           | 7.14 %     |
| 21 – 30 Years| 10          | 14.28 %    |
| 31 – 40 Years| 18          | 25.72 %    |
| 41 – 50 Years| 14          | 20.00 %    |
| 51 – 61 Years| 12          | 17.15 %    |
| 61 – 70 Years| 10          | 14.28 %    |
| **Total**    | **70**      | **100 %**  |

### Table 2: Sex wise distribution of renal lesions.

| Sex       | No of cases | Percentage |
|-----------|-------------|------------|
| Male      | 48          | 68.57 %    |
| Female    | 22          | 31.43 %    |
| **Total** | **70**      | **100 %**  |

### Table 3: Histopathological spectrum of renal lesions.

| Lesions                                           | No of cases | Percentage |
|---------------------------------------------------|-------------|------------|
| Diffuse proliferative glomerulonephritis           | 2           | 2.85 %     |
| Membranoproliferative glomerulonephritis           | 4           | 5.72 %     |
| Membranous nephropathy                            | 10          | 14.30 %    |
| Benign nephrosclerosis                            | 2           | 2.85 %     |
| Focal segmental glomerulosclerosis                | 2           | 2.85 %     |
| Lupus nephritis                                   | 2           | 2.85 %     |
| Diabetic nephropathy                              | 6           | 8.58 %     |
| Tubulo interstitial nephritis                      | 4           | 5.72 %     |
| Granulomatous pyelonephritis TB                    | 4           | 5.72 %     |
| Xanthogranulomatous pyelonephritis                | 4           | 5.72 %     |
| Oncocytoma                                         | 2           | 2.85 %     |
| Angiomyolipoma                                     | 2           | 2.85 %     |
| Thyroid follicular carcinoma like RCC              | 1           | 1.43 %     |
| Chromophobe RCC                                    | 3           | 4.29 %     |
| Clear cell RCC                                     | 2           | 2.85 %     |
| Mucinous tubular RCC                               | 2           | 2.85 %     |
| Renal squamous cell carcinoma                      | 1           | 1.43 %     |
| **Total**                                          | **70**      | **100 %**  |
Fig. 1: A. & B. Gross and microscopy of Chronic Pyelonephritis. C. & D. Gross and microscopy of Tubulo interstitial nephritis. E. Diffuse proliferative Glomerulonephritis & F. Membrano Proliferative glomerulonephritis.
Fig. 2. A. Thyroid follicular carcinoma like renal cell carcinoma. B. Tubular mucinous variant of renal cell carcinoma. C. Chromophobe variant of RCC. D. Clear cell variant of RCC. E. Renal Oncocytoma. F. Angiomyolipoma. G. Squamous cell carcinoma of kidney.
et al, where the most common age group affected was 5th and 6th decade.[3,10,11] This study is also variable with Vinay KS et al, Ajay Kumar et al and Kotta Devender Reddy et al studies, where most common age group affected was 4th decade.[3,10,11] In our study, the mean age of the population was 39 ± 5.87 years. Study by Jaynul Islam et al, shows that the most common affected age group was 21–30 years, it is quite similar to Habib et al., and Mohammad et al.[12-14] Whereas, in a study by Pankaj Beniwal et al., the mean age was 64.02 ± 7.87 years; 67.7 ± 6.4 years in Gupta et al.; and 63.5± 3.2 years in Kohli et al. study.[15,16]

In the present study, 48 cases were males and 22 cases were females showing male preponderance. This is in concordance with Baswaraj et al, Mohammad Rafique et al., and Kishore H Suryawanshi et al.[8,17,18]

In a study by, Vikram Narang et al., encountered male preponderance with a M:F ratio of 1:7:1 which was also noted by Neggada et al., (1.6:1) and Eke N et al., (1.6:1).[17-20]

In a study by Pankaj Beniwal et al., males accounted for 70.4% (n = 162) of the study population. Nephrotic syndrome (NS) is the most common (57.02%) clinical presentation, followed by nephritic syndrome (33.19%) which was quite closer to the study of Jalalah at Saudi Arabia and Mardanpour et al at Iran.[21,22]

Among the adequate biopsies, 95.19% were glomerular diseases, 3.37% were tubulointerstitial nephritis and 1.44% were ATN. Study at CMC, Velor and China shows above frequency and Pakistan reveals the very high incidence of TIN (11.6%). Mohammad et al., got 3% ATN among 100 renal biopsies in Pakistan.[23-25]

Out study results shows discrete spectrum of renal lesions. Study by Vikram Narang et al., shows that there were 82 cases renal tumours; out of which 70 (85.3%) cases were of renal cell carcinoma followed by transitional cell carcinoma 7 cases (8.5%). Beisland et al., who had 72.7% cases of RCC and 21.9% cases of TCC Jha et al, had 87.3% cases of RCC and 12.6% cases of T.C.C. while Ali Tebibi et al., encountered 84.6% cases of RCC and 4.7% cases of TCC.[26-28] Low grade RCC (nuclear grade 1 and 2) comprised of 63.1% case while high grade RCC (nuclear grade 3 and 4) comprised of 36.9% cases and Srivastava et al., also had 52.8% low grade tumours.[28,29]

In the present study, among neoplastic lesions, majority were malignant (69.72 %). This is in concordance with Vinay KS et al, Bharti Devi Thaker et al[31] studies. In the present study, non-neoplastic lesions (81.4 %) were predominant over neoplastic lesions (18.6 %). Studies conducted by Bersland et al., shows 30.8% non-neoplastic and Danepport et al., shows 48.6% non-neoplastic.[32,33]

In a study by Vikram Narang et al. shows the total of 155 total nephrectomy specimens, out of which 82 cases were neoplastic and 73 cases with chronic pyelonephritis(60.3%). Renal neoplasms constituted 82 cases. Clear cell RCC was the commonest (57 cases) followed by transitional cell carcinoma of renal pelvis (7 cases).

In the present study, among non-neoplastic lesions, chronic pyelonephritis with hydronephrosis was predominant. This is in concordance with Shanmuga Swamy et al and Ashima N Amin et al studies.[33] In a study by Bharti Devi Thaker et al.,[31] showed that maximum number of cases were of Non neoplastic. Non Neoplastic (62 cases) were the most common followed by malignant cases (7cases) and the least common were benign tumours (1 case).[34,35]

**Conclusion**

The present study reveals various histological patterns of lesions in renal biopsies and nephrectomy specimens. Our study reveals that non-neoplastic lesions are more commonly encountered lesions. Most common age group affected was 3rd and 4th decade. Chronic pyelonephritis is the most common non-neoplastic lesion and Chromophobe renal cell carcinoma being common among malignant tumors. Benign tumors of kidneys are less common.

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