

Histopathological Spectrum of Renal Lesions: A 3 year Prospective Study of a Tertiary Care Teaching Centre

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ABSTRACT

Objective: The present study was undertaken over a period of 3 years prospectively at a single tertiary care centre in the northern part of India catering to urban as well as rural population in an area of poor human developmental indices to take a glimpse into the pattern of the renal diseases. **Methods:** The present study comprised of studying all the biopsies (core needle as well as nephrectomy coming to the pathology department from in and around city of Allahabad, Uttar Pradesh (India)). **Results:** Data in this study showed that glomerulopathies (78.39%) were the most common of the renal lesions followed by chronic pyelonephritis on nephrectomy specimen (10.55%). Of all the glomerulonephritis; end stage renal disease (ESRD) was the commonest glomerulopathy, accounting for 14.14% of all glomerulopathies. **Conclusion:** The study thus concludes that ESRD along with CPN (both leading to dialysis dependant renal failure) continues to be the major challenge to patients suffering from renal disorders. The finding of ESRD as the most common glomerulopathy in the region under investigation should prompt more aggressive health programmes to preserve kidney function and to avoid renal replacement therapies.

KEYWORDS: Epidemiology, Prospective, Renal diseases, Spectrum

INTRODUCTION

To understand and to ascertain the trend/pattern of any disease process, epidemiologic studies are the basic building blocks. These studies are eventually helpful in yielding important information for not only diagnostic purposes but also for therapeutic interventions. Various nodal agencies of government at state and national levels then utilize the information obtained to implement related health and education programmes. Apart from various biochemical and serological investigations it is the ultrasound guided renal core biopsy (histopathological examination) which in the field of nephrology remains the gold standard for diagnosing various renal disorders.¹

The present study was undertaken over a period of 3 years prospectively at a single tertiary care centre in the northern part of India catering to urban as well as rural population in a resources deficient area to over all ascertain the spectrum of the renal diseases.

MATERIALS AND METHODS

The present study comprised of prospective spectra of renal lesions from in and around city of Allahabad, Uttar Pradesh (India). 164 patients with suspected lesions of

renal system especially the kidney, attending the outpatient department (OPD) of Medicine, Surgery and Paediatrics; S.R.N and its allied hospitals, Allahabad were included in the prospective study during the period of January 2006 to December 2008. Both renal biopsies and nephrectomy specimen were subjected to light microscopic studies with conventional H& E and other special stains.

RESULTS

Overall

In the current study, glomerulonephritis (78.39%) was the most common renal lesion as shown in Table-1. Chronic pyelonephritis (CPN) followed the glomerulopathies as the next most common renal lesion (10.55%). Cystic disease of kidney and post traumatic kidney were the least common lesions having one case (0.62%) each. Of the 162 cases in the study conducted; males and females accounted for 107 (66.04%) and 53 (32.71%) cases respectively. The average age recorded in the present study was 32.87 years.

Subcategorizing as done in Table-2 of all the renal lesions revealed that end stage renal disease (ESRD) followed by

How to cite this article:

Mannan R, Kaur H, Singh PA, Misra V, Mehrotra R, Manjari M. Histopathological Spectrum of Renal Lesions: A 3 year Prospective Study of a Tertiary Care Teaching Centre. Int J Dent Med Res 2015;1(6):11-13.

LESION	TOTAL	% OF ALL LESION	M:F Ratio	AVG AGE
Glomerulopathies	127	78.39	2.15:1	34.67
End Stage Renal Disease (ESRD)	21	13.04	2.5:1	37.91
Membranous	16	09.93	3:1	34.75
Mesangial Proliferative	11	06.83	1.75:1	31.77
Diffuse Proliferative	10	06.21	4:1	36.66
Focal Segmental/ Proliferative	10	06.21	2.3:1	49.33
Membrano Proliferative (MPGN)	08	04.96	1:1	27.64
Systemic Lupus Erythematosus (SLE)	08	04.96	1:7	33.56
Diabetic Nephropathy	07	04.34	1.3:1	48.20
Focal Segmental Glomerulosclerosis (FSGS)	07	04.34	6:1	17.57
Inadequate	07	04.34	6:1	34.66
Crescentic	05	03.10	4:1	27.00
Minimal Change Disease	05	03.10	3:2	14.40
Amyloid Nephropathy	04	02.48	3:1	33.75
Normal	03	01.86	2:1	37.00
Renal Cortical Necrosis	02	01.24	0:2	37.00
Benign Nephrosclerosis	01	00.62	1:0	60.00
Focal Necrotizing	01	00.62	1:0	60.00
Focal Global Glomerulosclerosis	01	00.62	0:1	07.00
Chronic Pyelonephritis	17	10.55	1.5:1	34.87
Neoplasia	14	8.69	1.8:1	37.46
Tubercular Pyelonephritis	02	1.24	1:1	26.50
Cystic Disease of Kidney	01	0.62	0:1	00.60
Normal Kidney (post trauma)	01	0.62	1:0	21.00
TOTAL	162	100.00	2:1	32.87

TABLE-1: Subdivision of various renal lesions according to the frequency, age and sex distribution

LESION	TOTAL	% OF ALL NEPH.	M:F	AVG AGE(Yrs)
Chronic Pyelonephritis	17	48.57	2:1	34.87
Neoplasia	14	40.00	2:1	37.46
Tubercular Pyelonephritis	02	05.71	1:1	26.50
Cystic Disease of Kidney	01	02.85	0:1	00.60
Normal Kidney (post trauma)	01	02.85	1:0	21.00
TOTAL	35			32.87

TABLE -2: Renal lesions distributed according to the total nephrectomy specimens received

CPN were the most common renal lesions in the current study pointing towards the dominance of the renal replacement nature of these lesions. If taken together, both the lesions together accounted for 23.45% of all the renal lesions in the present study.

The male predominance trend was seen in virtually every lesion (overall, 109 males for 53 females), however; more female cases were recorded in systemic lupus (SLE), renal cortical necrosis (RCN), tubercular pyelonephritis, focal global glomerular sclerosis and renal cystic disease accounting for 8, 2, 1, 1 and 1 case each respectively.

Glomerulopathies on Renal Core Biopsies

Distribution of various types of glomerulopathies is shown in Table-1. In the study; end stage renal disease

(ESRD) accounted for majority of glomerulopathies (16.53%), followed by membranous glomerulopathy (12.59%). Males outnumbered females by a ratio of 2:1. Apart from SLE and RCN which were common in females, all the other glomerulopathies showed a male predominance. The average age group in glomerulopathies was 34.90 years, with age groups ranging from 7.0 years to 60.0 years. Focal global glomerulosclerosis, focal necrotizing glomerulonephritis and benign nephrosclerosis were the least common of all the glomerulopathies accounting for one case (0.62%) each.

Combined Renal Lesions on Nephrectomy specimen

Table-2 and 3 shows the renal lesions distributed according to the nephrectomy specimen. As the second most common lesion overall, CPN was recorded as the most common reason for patients undergoing nephrectomies, accounting for 48.57% of all the received nephrectomy specimen followed by renal neoplasia (40.00%). The least end of spectrum was the one case each of post traumatic kidney and the cystic kidney disease nephrectomy specimen. The nephrectomy specimens accounted for 21.06% of all the renal cases in which males predominated the females (107 cases versus 53 cases respectively). The average recorded age was 32.87 years.

TUMOR	TOTAL	% OF TUMOR	% OF ALL RENAL LESION	M:F	AVG.AGE (IN YRS)
BENIGN					
Angiomyolipoma (AML)	01	07.14	00.61	0:1	45.00
MALIGNANT					
Renal Cell Carcinoma	08	57.14	04.93	3:1	63.33
Wilm's Tumor	04	28.57	02.46	3:1	03.65
Transitional Cell Carcinoma	01	07.14	00.61	0:1	70.00
TOTAL	14	100.00	08.64	2:1	37.46

TABLE-3: Distribution of renal neoplasia according to age, sex and relative proportion

Renal Neoplasia on Nephrectomy Specimen

Table-3 shows distribution of renal neoplasia in the present study which revealed only a single case of benign neoplasm (angiomyolipoma) of kidney seen in a 45 year old female. Of the malignant neoplasms; renal cell carcinoma (RCC) was the commonest one with an overall proportion of 57.14% (approximately 2/3 of the renal lesions). RCC was seen to be more common in males with M: F ratio of 3: 1. Wilm's tumor was seen in 28.57% of cases and accounted for the commonest neoplastic lesion in the paediatric age group with an average age of 3.65 years.

DISCUSSION

The significant point which was noted in the present study was that the commonest lesion noted if sub-categorized overall and on core biopsies was ESRD. If the sub-categories of renal failure due to diabetes and amyloidosis were added in primary ESRD, then the overall sub-group of all causes of chronic renal failure

(CRF) becomes very large pointing towards the gravity of the situation. In contrast to the findings of our study; ESRD is not prevalent to such a degree in other studies which were done in various parts of India.²⁻⁵

After ESRD; the next most common pattern of glomerular injury was recorded as Membranous (MGN) and Mesangio-proliferative glomerulonephritis (MEGN). The prevalence of MGN is again a little lower documented in comparison to studies done elsewhere in India.^{6,7} In contrast to Indian studies; MGN remains the main cause of glomerular injury in most of the adults in Europe, China and Indonesia. It is the second commonest lesion in many countries such as Italy, Japan, Hong Kong, Singapore and Taiwan after MEGN.⁸⁻¹¹ In India, various glomerulopathies are seen according to various geographical locations whilst in south and west India it is MEGN is the commonest cause of glomerulopathy; it is the Minimal Change Disease (MCD) which is the commonest pattern noted in studies originating from north India.²⁻⁵

In the present study, CPN was the commonest reason for nephrectomy presenting with fever and backache similar to that observed by other researchers. RCC was the commonest neoplasm recorded in the nephrectomy specimens (57.14% cases) with a mean age of 63.3 years. Motzer et al, (1996) observed that the average age range of diagnosis of RCC was 55 to 66 years. Male: Female (M: F) ratio of 2: 1 was almost similar to that reported by Rosai, (2004).^{12,13}

A high prevalence of ESRD in the current study along with CPN (as the commonest cause of nephrectomy) points towards the delayed presentation as a great challenge to the physicians not only working in and around Allahabad but also in other third world countries.

CONCLUSION

The study concludes that ESRD along with CPN (both leading to dialysis dependant renal failure) are the major challenge to patients suffering from renal disorders in our area. This in the region under investigation should

prompt both the practising physicians and the pathologist in this region to be ever vigilant against a possibility of renal failure in patients attending outpatients so that early action can be initiated.

REFERENCES

1. Mannan R, Bhasin TS, Singh PA, Misra V, Manjari. The Pattern of Glomerulonephritis in the North Indian Gangetic Plain- A 13-Year Epidemiological Study. *J Clin Diagn Res.* 2012; 6(5): 855-8.
2. Narasimhan B, Chacko B, John GT, Korula A, Kirubakaran MG, Jacob CK. The characterization of kidney lesions in Indian adults: Towards a renal biopsy registry. *J Nephrol.* 2006;19:205-10.
3. Vanikar AV, Kanodia KV, Patel RV, Trivedi HL. Primary IgA nephropathy in western India. *Indian J Nephrol.* 2005;15:227-31
4. Agarwal SK, Dash SC. The spectrum of renal diseases in Indian adults. *J Assoc Physicians India.* 2000;48:594-600.
5. Date A, Raghavan R, John TJ, Richard J, Kirubakaran MG, Shastry JC. Renal disease in adult Indians: A clinicopathological study of 2,827 patients. *Q J Med.* 1987;64:729-37.
6. Deshpande GU, Munjal R, Rai R: Spectrum of nephropathies with special reference to primary glomerulopathies. *Med J Arm For Ind.* 2000; 56 (2):125-9.
7. Chandrika BK: Non – neoplastic renal disease in Kerala, India-analysis of 1592 cases, a two year retrospective study. *Ind J Path Micro.* 2007; 50 (2): 300 -2.
8. Li LS. Renal disease in China: an overview. Singapore: Proc 3rd Asian Pacific Congr Nephrol; 1986; 292-96.
9. Chiang GS, Woo KT, Edmondson RP. The pattern of glomerulonephritis in Singapore. Singapore: Proc 3rd Asian Pacific Congr Nephrol; 1986; 249-61.
10. Lim GJ. Hepatitis B virus associated membranous glomerulonephritis in children in Taiwan. Taipei: Proc 7th Asian Colloquium Nephrol; 1987; 119-20.
11. Sidabatur RP, Lumenta NA, Suharjono T. Glomerulonephritis in Indonesia. Singapore: Proc 3rd Asian Pacific Congr Nephrol; 1986; 282-91.
12. Motzer RJ, Bander NH, Nanns DM, Renal cell carcinoma. *New Eng J Med* 1996, 335: 865-875.

Source of Support: Nil
Conflict of Interest: Nil