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Original Research Article.

Clinicopathological Pattern of Biopsy Proven Renal Disease: A Four-Year Retrospective Study From a Tertiary Care Centre in Southern India

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ABSTRACT

Background: Renal biopsy is the gold standard for diagnosis of glomerular diseases. In many countries there are renal registries which carries the clinical, epidemiological, pathological and therapeutic aspects of each renal diseases. In India such a registry is lacking. In light of the paucity of data, we intend to study the clinicopathological pattern of glomerular diseases from a tertiary care center in southern part of India.
Objectives: 1) To find out the pattern of various biopsy proven glomerular diseases in Government Medical college Kottayam.2) To correlate the pathologic findings in glomerular diseases with the clinical and laboratory parameters.
Methods: Descriptive study from Jan 2013 to Dec 2016. All biopsies are assessed by light microscopy and special stains (Periodic acid Schiff, Jones reticulin and Masons trichrome).
Results: Out of 318 biopsies males (58.5%) predominated and mean age of patients was 39.16 +/_ 15.7yrs. The primary glomerular diseases (86.5%) predominated with a dominance of diffuse endocapillary proliferative glomerulonephritis (20.8%). The most common secondary glomerular disease as diabetic nephropathy. Only a significant difference was noted in age and systolic BP among two study groups.
Conclusion: The significant difference in age may because most of the secondary diseases are constituted by nephropathy due to diabetes mellitus which is very common in India.

Keywords: Clinicopathological Pattern, Biopsy Proven, Renal Diseases, Four-Year, Retrospective Study.

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BACKGROUND

Medical renal diseases are usually suspected based on clinical and laboratory parameters such as proteinuria, hematuria, renal failure and history of systemic diseases affecting kidney like diabetes, hypertension, SLE, amyloidosis etc. The gold standard method for the confirmation of diagnosis is by renal biopsy with the use of light microscopy, special stains and electron microscopy. In many countries there are renal registries which collect data from different hospitals across the country for the better care of patients with renal disease and these registries can be linked with many other registries to study the association between renal and many other diseases and we can also have easy access to the patient data easily from any part of the country. In India such a registry is lacking and we only have data from individual institutions from various parts of country.[1]

RATIONALE

From the southern part of India also there are not much data regarding the pattern of renal diseases. In light of the paucity of data from Kerala, we intend to study the pattern of glomerular diseases from a tertiary care centre in southern part of India. This study will be performed with the purpose to interpret the renal biopsies and to correlate the pathological findings of glomerular diseases with clinical and laboratory parameters and also to analyse the fluctuating trends among the biopsy proven glomerular disease.

AIMS

1) To find out the pattern of various biopsy proven glomerular diseases in Government Medical college Kottayam.

2) To correlate the pathologic findings in glomerular diseases with the clinical and laboratory parameters

MATERIALS AND METHODS

Type of Study: Descriptive study -Retrospective

Study Period: 4 yrs. from January 2013 to December 2016

Study Location: Department of Pathology, Government Medical college, Kottayam, Kerala, India.

Sample Size: All cases of renal biopsies received in the department of pathology during the period from January 2013 to December 2 016.

Material: The histopathology reports of renal biopsies received in the department of pathology during the period from January 2013 to December 2016 and the clinical and laboratory data of these patients as from completely filled pathology requisition form.

Exclusion Criteria: Renal biopsies where the sample is inadequate for interpretation and incomplete biopsy requisition forms.

Methodology: A retrospective review of reports of native renal biopsies performed on patients at Government Medical College, Kottayam, Kerala, India, from Jan 2013 to Dec 2016 will be undertaken. All renal biopsies were analysed by the same pathologist by light and special stains (Periodic acid Schiff, Jones reticulin and Masons trichrome). and were classified into different renal pathology categories. The clinical data of the patients will also be collected with the biopsy findings.

Data Analysis: The data thus collected will be analysed by SPSS 16 version and the different glomerular diseases are categorized according to histopathology, and the clinical presentation (age, gender,24 hr. urine protein, serum creatinine, systolic and diastolic BP) of each diagnosis are studied. A comparative study of features of primary and secondary glomerular diseases were also done. If the data followed normality, we used to mean to assess the frequency. In those case was normality is not followed we used median. We used chi-square test to compare the mean age between primary and secondary glomerular diseases since it followed normality. Other variables were compared using Man Whitney U test.

Table 1: Correlation of clinical features with each pathological finding

Diagnosis	N	Gender		Age		Creatinine			Blood Pressure			24 hr. urine protein		
		F	M	Mean	SD	Med	Q1	Q3	Med	Q1	Q3	Med	Q1	Q3
Iga Nephropathy	58	25	33	35.5	12.37	2	1.2	3.8	150/98	120/80	170/106	2.8	1.4	4.0
Focal Segmental Glomerulosclerosis	25	10	15	26.52	10.63	1.1	.75	2.9	130/80	120/80	144/90	3.0	1.6	4.3
Diffuse Proliferative Glomerulonephritis	29	12	17	30.66	18.43	1.1	.7	2.3	120/80	120/80	139/90	3.9	3.0	5.7
Diffuse Endocapillary Proliferative Glomerulonephritis	66	31	35	39.48	16.16	1.7	1	3.1	140/90	120/80	160/100	3.04	1.3	6.8
Crescentic Glomerulonephritis	22	10	12	45.68	13.51	8.0	4.9	11	156/90	140/80	180/100	2.45	.99	4.0
Minimal Change Disease	13	6	7	40.23	15.10	4.9	1.4	5.6	150/90	140/90	160/100	4.0	3.0	5.0
Lupus Nephritis	10	3	7	47.30	7.28	4.3	1.5	7.2	166/90	155/88	192/102	3.6	2.9	6.3
Membranoproliferative Glomerulonephritis	31	13	18	41.23	15.8	1.6	1.1	2.3	140/90	130/80	180/100	3.0	2.0	6.3
Mesangioproliferative Glomerulonephritis	13	5	8	44.15	11.71	5.8	2.4	10.2	160/100	126/80	186/110	3.0	1.2	5.2
Amyloidosis	14	5	9	41.50	16.52	1.7	1.1	4.2	160/100	130/90	170/100	3.4	1.9	6.0
Diffuse Sclerosing Glomerulonephritis	4	1	3	59.50	4.04	1.0	.85	1.17	130/90	120/76	156/90	5.9	4.3	7.0
Diabetic Nephropathy	19	6	13	53.58	14.77	1.4	.9	2.1	140/90	120/80	160/100	4.8	1.2	6.1
Membranous Nephropathy	4	1	3	46.75	11.75	4.5	2.8	7.3	156/100	120/76	220/126	4.1	1.1	6.1
Chronic Sclerosing Glomerulonephritis	10	4	6	40.21	12.80	1.7	.82	6.1	140/90	120/80	158/100	1.6	.81	2.6

F: Female; M: Male; Med: Median

RESULTS

Total number of renal biopsies during the study period were 318. 186(58.5%) were males and 132(41.5%) were females. The age of the patients ranged between 4-83 yrs. with a mean age of 39.16 +/_ 15.7yrs. The average S. creatinine was 1.8 mg% (Q1 - 1.1mg%; Q3 – 4 mg%), BP was 140/90mm of Hg (Q1-120/80mm of Hg; Q2 – 160/100mm of Hg) and 24 hour urine protein was 3.1gm (Q1 – 1.6gm; Q3- 5.3gm).

The primary glomerular diseases accounted for 275 patients (86.5%) and secondary glomerular diseases was seen in 43(13.5%) cases. The most common primary renal pathologic change was diffuse endocapillary proliferative glomerulonephritis in 66 patients (20.8%) followed by IgA Nephropathy in 58 patients (18.2%).and most common secondary glomerular disease was diabetic nephropathy in 19 patients (6%). The age group, gender

predilection ,24 hr. urine protein and serum creatinine values of each diagnosis is listed in the table 1. We performed independent sample T test to know is there any significant difference in the average age between primary (mean age -37.75; SD – 15.45) and secondary glomerular diseases (mean age – 48.19; SD – 14.75) and it is observed that there is a statistically significant difference (T-statistic is -4.14 and P value less than 0.001) in the average age between these groups. No significant difference among two genders was observed between primary and secondary renal diseases (Table 2). Among S. creatinine, Systolic BP, Diastolic BP and 24 hr. urine protein, only systolic BP showed significant difference between primary & secondary renal diseases. (table 3)

Table 2: Comparison of gender among primary and secondary glomerular diseases

Group	Primary glomerular disease	Secondary glomerular disease	Chi square statistics	P value
Male	157	29	1.64	0.2
Female	118	14		

Table 3: Comparison of clinical variables other than age in primary and secondary glomerular diseases

Variable	Group	Median	Q1	Q3	U statistics	P value
Creatinine	**Primary glomerular disease**	1.9	1.1	4.2	5724	0.73
	Secondary glomerular disease	1.6	1.2	4.0		
Systolic BP	**Primary glomerular disease**	140	120	160	4646	0.023*
	Secondary glomerular disease	160	130	170		
Diastolic BP	**Primary glomerular disease**	90	80	100	5262	0.23
	Secondary glomerular disease	90	80	100		
24 hr. urine protein	**Primary glomerular disease**	3.0	1.6	5.0	5097	0.146
	Secondary glomerular disease	3.8	2.0	6.1		

*P value less than 0.05 is significant

DISCUSSION

In our study the mean age of those who have undergone biopsy for glomerular diseases is 39.16 yrs. This is comparable to other studies done in India and Nepal and Pakistan.[2-7]

Likewise, in many other studies in India[8] our study also showed male preponderance, but in few studies done in Nepal females predominated.[2,9,10]

Mean S. creatinine in our study was 1.8mg%. In a study done among older age group in Italy[11], the mean serum creatinine was more than 4 mg%. The mean blood pressure of our study population was 140 /90 mm of Hg. The average 24 hr. urine protein was 3.1 gm in our study. These were comparable to one study done in Turkey.[12]

The most common pathological change observed among primary glomerular diseases was diffuse endocapillary proliferative glomerulonephritis followed by IgA Nephropathy. Different regions show different patterns in the histopathological diagnosis. One study done in Nepal [2] and a study done in South India[13] shows predominance of IgA Nephropathy followed by Focal segmental Glomerulosclerosis. Two studies done in Pakistan[14,15] shows predominance of Focal segmental glomerulosclerosis. Among studies done in India, a North-western Indian[7] and south Indian study showed Minimal change disease as the most common histological type, another study from other part of India[16] showed predominance of Focal segmental glomerulosclerosis. One large study from South India[17] shows Non-IgA mesangioproliferative glomerulonephritis as the most common pathology.

Most common secondary glomerular disease in our study was diabetic nephropathy. In one study from Republic of Korea[18], North western India[7], North Eastern India[19] and three studies from

South India and[5,13,17], Lupus nephritis accounted for the most common secondary glomerular disease. Another study from India[16] showed amyloidosis as the most common secondary glomerular pathology

In our study only a significant difference was found in age and systolic BP among the primary and secondary glomerular diseases. Mean age was higher for those with secondary glomerular diseases. In a study done in Brazil[20] age was insignificant but gender, duration of symptoms haematuria, proteinuria and serum creatinine showed a significant association.

CONCLUSION

The significant difference between primary and secondary glomerular diseases in our study may be due to the fact that most of the patients among the secondary glomerular disease in our study were diabetic patients which was usually occurring in older age group and is very common in this part of India.

There is very much variation among clinicopathological features of glomerular diseases worldwide and within a country itself. Hence a national renal registry is required for every country for a better understanding of renal diseases

LIMITATIONS

This is just a descriptive study. Further studies have to be done for confirmation of the findings

IMPLICATION FOR HEALTH POLICY/ PRACTICE/ RESEARCH/ MEDICAL EDUCATION

If every nation is setting up a renal registry, we can have a better understanding of the disease and improve the care of patients with renal diseases

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ETHICAL STATEMENT

The research followed the tents of the Declaration of Helsinki. The Ethics Committee of Government Medical College, Kottayam, Kerala, India approved this study. The institutional ethical committee at Government Medical College, Kottayam, Kerala, India approved all study protocols (IRB No: 15/2017). Accordingly, written informed consent taken from all participants before any intervention. This study was not extracted from any M.D/MSc thesis.

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