KIDNEY BIOPSY PROVED DIAGNOSIS OF RENAL DISORDERS IN A TERTIARY CARE HOSPITAL: SHARING A 4 YEARS EXPERIENCE

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ABSTRACT

Objective: To evaluate outcome of renal biopsies in patients at a nephrology unit of a tertiary care centre at Rawalpindi over a period of 4 years.

Study Design: Retrospective and cross sectional observational study.

Place and Duration of Study: Department of Nephrology, Military Hospital Rawalpindi, from 2008-2012

Methodology: The study was based upon the data of patients with different renal pathologies who underwent kidney biopsy for establishment of diagnosis. All the patients who underwent successful kidney biopsy from 2008-2012 in our hospital were included in the study.

Results: A total of 235 patients underwent successful kidney biopsy (with conclusive pathological findings). Out of these, 170 (72%) were males and 65 (28%) were females and the age ranged from 06 years to 55 years, with mean age of 28.6 years among males and 31.5 years among females. Out of these 100 (42.6%) patients had mesangioproliferative glomerulonephritis, 65 (27.6%) had membranous nephropathy, 37 (15.7%) patients had focal and segmental glomerulosclerosis, 11 (4.7%) patients had IgA glomerulopathy, 7 (3%) had minimal change nephropathy whereas 15 (6.4%) patients had other causes of glomerulonephritis (including systemic illnesses, pyelonephritis, acute tubular necrosis and interstitial nephritis).

Conclusion: The most common biopsy proved diagnosis in the patients with different renal disorders was mesangioproliferative glomerulonephritis and the least common was minimal change nephropathy.

Keywords: Kidney biopsy, nephritic, nephrotic.

INTRODUCTION

Percutaneous renal biopsy in admitted as well as outpatient settings is a minimally invasive diagnostic modality with pivotal role in the diagnostic and therapeutic decision making. It may be obtained for a number of reasons, including the establishment of cause of renal damage, determine the extent and nature of kidney damage, staging of an already existing disease and sometimes involvement of kidneys by a systemic disorder[1,2].

The common indications for which renal biopsies are done include unexplained renal failure, proteinura, hematuria and staging of different diseases[1,3]. It is important to know the disease outcome in these kidney biopsies since it shows the relative prevalence of different causes of nephritic and nephrotic syndromes along with other possibilities (including systemic disorders etc) among these patients. It also helps in assessing the changing trends in the pattern of different renal disorders as well. These observations further lay down the basis for research workers to look for specific causes affecting these changing patterns in one specific geographic area. Furthermore these changing trends can be attributed to the increasing frequency of some non renal disorders prevalent in that area like hepatitis B and C infection in our country.

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METHODOLOGY

It is a descriptive study carried out at department of Nephrology, Military Hospital, Rawalpindi. The patient records including the biopsy reports from the year 2008-2012 were retrieved and included in the study. New patients presenting with a concurrent renal disease and requiring renal biopsy were also included in the study till Feb 2012. All the patients presenting

with a renal disease and requiring biopsy for affirmation of diagnosis were included in the study. However, patients with inconclusive biopsy results (including inadequate biopsy sample and inconclusive pathological findings) and renal transplant were excluded. All biopsies were performed by a trained nephrologist using a spring loaded tru-cut biopsy needle on admitted patients with adequate pre-procedure precautions to minimize peri-procedural morbidity.

Necessary pre and post biopsy data of all the patients undergoing renal biopsy was gathered from the patients' records at our hospital. All the biopsies were performed under ultra sound guidance (real time imaging). The outcome of the study was the pathological diagnosis of renal biopsies. The samples were separately collected for both histopathological and immunofluorescence studies. These were then sent under direct care of the conducting nephrologist to the laboratory in separate containers bearing appropriate labels. The sample for histopathology was sent in formalin and that for immunofluorescence in normal saline. For histopathologic evaluation, biopsied tissue was stained with hematoxylin-eosin and periodic acid Schiff stain after initial processing including embedding and cutting. Immunoflourescence staining was done with antibodies against IgG, IgM, IgA, C3, and other markers if indicated. All specimens were reviewed by a consultant pathologist.

The data has been analyzed using SPSS 15. The frequencies were calculated for gender distribution and for different pathological diagnoses of kidney biopsies whereas mean was calculated for age.

RESULTS

A total of 235 patients underwent successful renal biopsy (with conclusive pathological findings), out of these 170 (72%) were males and 65 (28%) were females, with age ranging from 06 years to 55 years with a mean age 29 years. Out of these 100 (42.6%) patients had mesangioproliferative glomerulonephritis, 65 (27.6%) had memebranous nephropathy, 37 (15.7%) patients had focal and segmental glomerulosclerosis, 11 (4.7%) patients had IgA glomerulopathy, 7 (3%) had minimal change nephropathy whereas 15 (6.4%) patients had other causes of glomerulonephritis (including systemic illnesses, acute tubular necrosis and interstitial nephritis.

DISCUSSION

Despite the dangers associated with kidney biopsy ranging from asymptotamatic hematuria to nephrectomy and death, it remains an important diagnostic intervention in patients with wide variety of renal disorders[4]. This risk has recently been minimized by active involvement of ultrasound examination for localizing biopsy site and follow up for post biopsy complications[5].

The difference in the pattern of diseases causing nephritic and nephrotic syndromes in an area is a well known phenomenon. It partly depends upon the racial and genetic factors and also on the prevalence of certain disease associations like high prevalence of chronic hepatitis C and B in our country. Furthermore the periodic assessment of such data can help in deciding future guidelines for the diagnosis and treatment of important renal disorders[6].

In our study we found that mesangioproliferative glomerulonephritis was the commonest cause of glomerulonephritis followed by others. This is however contrary to most international data that suggest that IgA nephrapathy is the commonest cause of glomerulonephritis world wide. This discrepancy is probably due to the high prevalence of chronic hepatitis B and C infection in our country which is an important cause of secondary mesangioproliferative glomerulonephritis here7.

A slightly different disease pattern was shown in the data published form Sindh Institute of Urology and Transplant where a total of 316 adult patients were included in

the study. Of these, 201 (63.6%) were male and 115 (36.4%) were female. Mean age was 28.4 ± 10.51 years with a range of 16-78 years. The spectrum of pathological lesions in the adult nephrotic population was wide and comprised focal and segmental glomerulosclerosis (39.87%), followed by membranous nephropathy (26.58%), minimal change disease (14.82%), mesangiocapillary glomerulonephritis (4.3%), mesangio-proliferative glomerulonephritis (4.11%), post-infectious glomerulonephritis (2.84%), IgA nephropathy (2.53%), and other rare lesions[8]. The difference of results seen in this study as compared to our study can be attributed to the different age groups included in both studies. In our study we considered both paediatric and adult age groups whereas only adult population was included in the above mentioned study by Sindh Institute of Urology and Transplant. Secondly the upper limit of age in this study was 78 years and in ours was 55 years.

Likewise the statistics published by our regional neighbor India, reveals an even different pattern of diagnoses made on kidney biopsies of the patients. One of such studies conducted in a tertiary care hospital located in the South India analyzed the distribution of biopsy-proven renal disease and its changing pattern over a period of 19 years. All the renal biopsies performed from 1990 to 2008 were reviewed retrospectively. Biopsies were evaluated by light microscopy and immunofluorescence microscopy and also special stains when warranted. A total of 1849 biopsies were analyzed. The mean patient age was 32.27 ± 18.38 (range 10-80) years. The male:female ratio was 1.4:1. The most common indications of renal biopsy were nephrotic syndrome (49%), followed by renal failure (13.6%) and rapidly progressive renal failure (12%). Primary glomerulonephritis comprised 1278 (69.1%) of the total patients. Among the cases, the most common one was minimal change disease (21.8%), followed by focal segmental glomerulosclerosis (15.3%), membranous glomerulonephritis (10%), chronic glomerulonephritis (9.7%), postinfectious glomerulonephritis (8.1%), mesengioproliferative glomerulonephritis (7.5%), diffuse proliferative glomerulonephritis (6.7%), crescentic glomerul-onephritis (6.5%), IgA nephropathy (6.3%), membranoproliferative glomerul-onephritis (5.7%), focal proliferative glomerulonephritis (1.6%) and IgM nephropathy (0.5%). Secondary glomerular disease accounted for 337 (18.2%) of the cases. The most common secondary glomerulonephritis was lupus nephritis (80.1%), followed by amyloidosis (8%) and diabetic nephropathy (6.5%). Tubulointerstitial disease 124 (6.7%) and vascular disease 60 (3.2%) were less common. End-stage changes and miscellaneous disease were found in 37 (2%) and 13 (0.7%) cases, respectively[9].

Likewise international studies describe another different disease pattern. As published by Japanese national registry, where the data was collected from 818 patients from 18 centers in 2007 and 1582 patients from 23 centers in 2008, including the affiliated hospitals. Renal biopsies were obtained from 726 native kidneys (88.8%) and 92 renal grafts (11.2%) in 2007, and 1400 native kidneys (88.5%) and 182 renal grafts (11.5%) in 2008. The most common clinical diagnosis was chronic nephritic syndrome (47.4%), followed by nephrotic syndrome (16.8%) and renal transplantation (11.2%) in 2007. A similar frequency of the clinical diagnoses was recognized in 2008. Of the native kidneys, the most frequent pathological diagnosis as classified by pathogenesis was immunoglobulin A nephropathy both in 2007 (32.9%) and 2008 (30.2%). Among the primary glomerular diseases, membranous nephropathy was the most common disease both in 2007 (31.4%) and 2008 (25.7%)[10].

If we look carefully at the results of all the studies that we have referred here, then we find that all of these have generated different results from each other and from our study. This difference can partly be attributed to geographical, social, and racial factors with

difference of awareness but at the same time it invites more deliberate insight into these different patterns of biopsy proved renal disease patterns. Now-a-days lot of work is being done in the field of genetics to look for familial clustering of different causes of nephritic and nephrotic syndromes. This may explain in coming times the difference of statistics occurring in the same geographical area.

CONCLUSION

The histological examination of a percutaneous renal biopsy specimen provides important diagnostic help in a multitude of patients presenting with clinical suspicion of renal disease or renal parenchymal involvement in systemic diseases like vasculitis and autoimmune disorders. Mesangiproliferative glomerulonephritis remains the major histopathologic diagnosis in majority of the cases in the local patients.

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