

# RENAL BIOPSY IN 100 CASES OF SIGNIFICANT PROTEINURIA

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## ABSTRACT

**Objective:** Proteinuria is a common manifestation of Glomerular diseases, which may or may not be accompanied by haematuria and renal impairment. We conducted a prospective study to assess the value of renal biopsy, complications and the type of renal pathology at the Department of Medicine Hayatabad medical complex Peshawar from September 1998-2001.

**Material and Methods:** One hundred (100) patients having significant proteinuria, confirmed on 24 hours urinary protein estimation underwent ultrasound guided renal biopsy. Initially Tru-cut needles were used but later on monopty gun was used.

**Results:** There were 70 male patients (70%) and 30 female patients (30%); the mean age at presentation was 29.5 years (range 10-90 years). All patients tolerated the procedure well and there were no failure. The common complications noted were pain at biopsy site in 15 patients (15%), gross haematuria in 10 patients (10%). None of the patients needed blood transfusion or prolonged hospitalization. Nephrotic syndrome was the most common indication for biopsy followed by lupus nephritis and interstitial nephritis. Among the Nephrotic patients, minimal change disease and post- infectious glomerulonephritis (GN) were the commonest findings in patients below the age of 25 years, membrano-proliferative GN ranked first in adults while membranous GN and amyloidosis were more common in the elderly.

**Conclusion:** We conclude that renal biopsy is associated with an acceptably low rate of complications in our practice and that the pattern of renal histology varies slightly from those reported from other countries.

**Key words:** Proteinuria, Glomerular disease, Nephrotic syndrome, Minimal change disease, Renal biopsy.

## INTRODUCTION

The incidence of renal disease with its attending high morbidity and mortality is on rise for the last one and half decade in NWFP accounting for approximately 15- 20% of hospital admission in a general medical ward from our own unpublished data. Histological examination of the biopsied kidney remains the Gold standard for renal diagnosis, which has contributed enormously to nephrology.<sup>1</sup> In 1951, Inverson and Brun reported the first large series of needle biopsies of the kidney;<sup>2</sup> subsequently hundred of papers have been published reporting on the technique, ease and safety of percutaneous renal biopsies in different age groups.<sup>3</sup> Also, it is a common observation that various racial, genetic and environmental factors can influence the pattern of renal diseases. Laparoscopic renal biopsy is safe alternative to open renal biopsy where closed percutaneous renal biopsy is either a relative or absolute contraindicated.<sup>4</sup> Transjugular renal biopsy is also used in percutaneous renal biopsy failure cases. It is a safe procedure and allows multiorgan biopsy during same procedure.<sup>5</sup> Renal biopsy enable the physician to evaluate the histological process in the kidney for the purpose of diagnosis, prognosis and to see response to therapy.

We conducted a prospective study at the Department of Medicine Hayatabad Medical Complex, 1998-2001 to assess the value, complications of kidney biopsy and to study the pattern of renal diseases in 100 cases of significant proteinuria.

## MATERIAL AND METHODS

This prospective study was carried out at Department of Medicine Hayatabad Medical Complex Peshawar over a period of three years 1998-2001. One hundred patients were

included in the study. Inclusion criteria was very liberal, age 10-90 years and anyone having proteinuria of >1 gram/24 hours were included.

Those patients who were diabetic, cirrhotic, patients with CCF, and malabsorption were not included in study. Also those below 10 years of age, having coagulopathy, uncontrolled hypertension, single kidney, morbid obesity and patients with shrunken kidneys were excluded from this study.

Patients who fulfilled the criteria for renal biopsy were admitted and informed consent was taken from patient/guardian. All patients were thoroughly examined for any evidence of infection or bleeding diathesis. Blood grouping and cross matching was done and blood pressure was adequately controlled. Prior to biopsy clotting profile including platelets counts, clotting time, prothrombin time and partial thromboplastin time was done. Hb estimation and renal *u/s* was done in each case. Only a small number of patients needed correction for one or more abnormalities of these parameters. Most of the biopsies were done using Trucut needle (Braxton) R\* [6]. After biopsy patient's vital signs were recorded hourly for 12 hours and were discharged after 24 hours. Specimen was subjected to only light microscopy, as immunofluorescence and electron microscopy are not available. Biopsy specimen was considered satisfactory for diagnosis if they contain five or more glomeruli.

## RESULTS

The total number of cases included in this study was one hundred. Their age ranged between 10 years to 90 years, with a mean of 29.5 years. Majority of the patients were from south districts of NWFP and FATA. Eighty seven (87%) were Pakistani while 13 patients (13%) were from Afghanistan. There were 70 male patients (70%) and

PATTERN OF GLOMERULONEPHRITIS IN 100 CASES.

| Type of GN.            | Group I*<br>n=15 | Group II†<br>n=62 | Group III‡<br>n=15 | Group IV**<br>n=8 | Total<br>n=100 | %  |
|------------------------|------------------|-------------------|--------------------|-------------------|----------------|----|
| Membrano proliferative | —                | 22                | 3                  | 1                 | 26             | 26 |
| Minimal change Disease | 10               | 5                 | 2                  | —                 | 17             | 17 |
| Membranous             | —                | 8                 | 2                  | 3                 | 13             | 13 |
| Lupus                  | 1                | 10                | 1                  | —                 | 12             | 12 |
| Post infective         | 3                | 4                 | 2                  | —                 | 9              | 9  |
| FSGN                   | —                | 5                 | 2                  | —                 | 7              | 7  |
| Amyloidosis            | —                | 3                 | 1                  | 3                 | 7              | 7  |

\*age <25 yrs, † age 26-40 yrs, ‡ age 41-55 years & \*\* age > 56 yrs

TABLE-1

30 female patients (30%). Fifteen patients (15%) were less than 25 years old (group 1), sixty-two (62 %) were 26-40 years (group II), fifteen patients (15%) were 41-55 years (group III) and eight patients (8%) were more than 56 years old (group IV). Indication for biopsy among different age groups were the nephrotic syndrome in 60 patients (60%), lupus nephritis and interstitial nephritis was present in 12% and 9% respectively while amyloidosis in 7% and endocapillary GN was present in nine patients (9%). Sixty patients (60%) with nephrotic syndrome were aged 26-40 years, while the rest were distributed between other age groups as shown in table. As expected, minimal change disease and histology compatible with post infectious GN were commonest pattern in young patients age less than 25 years. Membrano-

proliferative ranked first in adult while membranous GN and amyloidosis was common in elderly Table-1 The most common complication of the procedure was pain at biopsy site in 14% and gross haematuria in 3%. None of the patients needed open surgical intervention or nephrectomy and there were no death due to procedure. Table 2, 3 and 4 summarizes 24 hours urinary proteins, blood urea and complications of renal biopsy respectively.

DISCUSSION

Renal Biopsy remains gold standard in establishing diagnosis, evaluating the acuteness, severity of the disease process and degree of reversibility. Clinical and laboratory evidence of nephritic syndrome and

24 HOURS URINARY PROTEIN IN 100 CASES OF PROTEINURIA.

| Protein in gram/24hours | Male<br>n=70 | Female<br>n=30 | Total<br>n=100 | %  |
|-------------------------|--------------|----------------|----------------|----|
| 1-2.4                   | 22 (22%)     | 6 (6%)         | 28             | 28 |
| 2.5-3.9                 | 40 (40%)     | 20 (20%)       | 60             | 60 |
| 4-6                     | 6 (6%)       | 4 (4%)         | 10             | 10 |
| More than 6             | 2 (2%)       | —              | 2              | 2  |

TABLE-2

**BLOOD UREA IN 100 CASES OF PROTEINURIA.**

| Blood Urea mg/dl | Male n=70 | Female n=30 | Total n=100 | %  |
|------------------|-----------|-------------|-------------|----|
| 20-39            | 36 (36%)  | 16 (16%)    | 52          | 52 |
| 40-59            | 4 (4%)    | 2 (2%)      | 6           | 6  |
| 60-99            | 12 (12%)  | 4 (4%)      | 16          | 16 |
| 100-150          | 14 (14%)  | 6 (6%)      | 20          | 20 |
| More than 6      | 4 (4%)    | 2 (2%)      | 6           | 6  |

TABLE-3

glomerulopathies are the most common indication for renal biopsy.<sup>7</sup> The main aim of this descriptive study was to know indication for renal biopsy in our setup, and to answer questions like do we have a different complication rate? And does the pattern of renal diseases differ from other countries?

In our study nephrotic syndrome was the commonest indication for performing renal biopsy (60%). This was slightly higher in young adult (group 11) 70%; but less common in older age group designated in this study as (group 111 & group 1V) which were 55% and 60.5% respectively. These percentages are similar to other studies, in which the nephrotic syndrome was an indication in 80.5% cases.<sup>8</sup> The overall complication rate in this study was 42%, of which pain at biopsy site was in 15% and gross haematuria in 10%. There was no mortality in our series. These rates are slightly higher than other studies, in which

overall complication rate was 7%, pain was reported in 4% and haematuria in 3%.<sup>9</sup> Freutz and Figueroa reported a case of prolonged intermittent haematuria which lasted for 61 days after renal biopsy of a transplanted kidney.<sup>10</sup> Bleeding has also reported in other studies.<sup>11</sup> A study from India showed gross haematuria in 6% of patients.<sup>12</sup> Study from Karachi, reported hematuria in 9% of patients.<sup>13</sup> The reported incidence of infection is very low in relation to renal biopsy<sup>14</sup> and none of our patient develop this complication. The incidence of arteriovenous fistula varies from one study to another (0.1%-23%).<sup>15</sup> However in this study we did not report any because renal arteriogram was not carried out.

The pattern of glomerulopathy in our study differs among different age groups. Minimal change disease was seen in 40% of cases in (group 1), which is less than 76.5% reported by some studies,<sup>16,17</sup> but higher than other.<sup>18,19</sup> This relatively low incidence of minimal change disease was due to the fact that these patients received empirical steroid first, biopsy was done in steroid resistant cases or those having frequent relapses. Membranoproliferative GN was the most common histological pattern in adult group (group 11) followed by membranous GN, 25% and 22% respectively. This is in contrast to low incidence of these two entities in international reports,<sup>20,21</sup> however the findings are similar to other studies.<sup>22,23</sup>

**COMPLICATION OF RENAL BIOPSY IN 100 CASES.**

| S. No. | Complications       | No. of patients | %  |
|--------|---------------------|-----------------|----|
| 1.     | Pain at biopsy site | 15              | 15 |
| 2.     | Mic. Haematuria     | 17              | 17 |
| 3.     | Gross Haematuria    | 10              | 10 |
| Total  | —                   | 42              | 42 |

TABLE-4

Nephrotic patients in the older and the elderly groups (group III & IV) had different histopathology. Amyloidosis and membranous GN account for majority of cases (group III 34% & group IV 80%). However the reported incidence of amyloidosis varies.<sup>24</sup> Crescentic GN was common in young adult group 38%, while it was low in other age groups. But it has been reported in adult and elderly patients.<sup>25</sup> FSGN was seen in 7% of our cases as against to 24% in KKHU.<sup>26</sup> Important feature of this study were;

- a) 100% success rate in procuring adequate biopsies and
- b) Absence of major complications. Different studies have reported variable success rate ranging from 76% to 89%.<sup>27</sup>

## CONCLUSION

We conclude that a kidney biopsy is a safe procedure in an experienced hands having acceptable rate of complications and has got a good yield. It is an essential tool to diagnose renal diseases and to assess its response to treatment in renal diseases. A large-scale study is needed to study the epidemiology of renal diseases in our setup.

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