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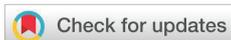
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Thesis

Renal biopsy correlation between indications and histopathology diagnosis

Abstract

Introduction: Renal biopsy is a procedure in which a sample of renal tissue is obtained for microscopic examination. Renal biopsy has contributed greatly to the classification of intrinsic renal diseases and, therefore, to a better knowledge of the pathogenesis involved. Although there are many studies regarding Renal Biopsy. There is little literature regarding correlation between indications and histopathology Diagnosis especially from India.

Patients and Methods: Patients who presented with clinical and/or laboratory features of renal disease, whose diagnosis were uncertain with non invasive modalities and fulfilled the requirement for renal biopsy were subjected to renal biopsy

Aims and objectives: The aim of this study was to find out the correlation between indications and histopathology of renal biopsy.

Results: In this prospective study 115 renal biopsies were performed in 70 males and 45 females. The mean age of males were 36 ± 14.3 and in females mean age was $29.6 + 12.8$. The most common age group biopsied was between 19-45yrs of age both among males (58.6%) and females (66.7) respectively. The number of patients below 18yrs of age was 21, 11 male and 10 female. Patients above the age of 45 were 23. 18 male and 5 females. The most common indication for renal biopsy was proteinuria with hematuria and subnephrotic proteinuria 26 patients each followed by nephrotic syndrome 25 patients. IgA nephropathy was the most common histopathology diagnosis (15.7%). The second most common histopathology diagnosis was Minimal change disease (10.4%) patients, however all these patients had nephrotic syndrome and normal renal biopsy on histology as no electron microscopy was done. Nephrosclerosis was third most common histopathology diagnosis seen (8.7%) patients. Focal segmental glomerulosclerosis was reported in (7.8%), Membranous glomerulonephritis in (7%), Lupus nephritis in (7%) Mesangiocapillary glomerulonephritis in (7%), chronic graft rejection in 3 (2.6%) all these three patients had presented with post, transplant azotemia. Acute tubular necrosis was reported in 5 (4.2%) patients, chronic interstitial nephritis in (5.2%) patients. In 6 patients (5.2%) biopsy were inconclusive which showed either blood clot, medullary tissue.

Conclusion: Renal biopsy is one of the most important diagnostic modality with nephrologists. In our study most common indication for renal biopsy was Proteinuria and Hematuria and most common histopathology diagnosis was IgA nephropathy.

Introduction

Renal biopsy an invasive procedure in which a sample of renal tissue is obtained [1]. Microscopic examination of the biopsied tissue can provide information needed to diagnose, monitor and/or treat renal disorder. The introduction of renal biopsy in clinical practice has represented one of the most important advances in the field of clinical nephrology. Renal biopsy has contributed greatly to the classification of intrinsic renal diseases and, therefore, to a better knowledge

of the pathogenesis involved. In spite of the flood of new and less invasive tests, renal biopsy is still an irreplaceable tool in assessing diagnosis and prognosis and guiding, the treatment of many renal diseases. It is being more frequently used, especially with the advancement of new biopsy guns and real-time ultrasound guidance. The first open renal biopsy was carried out in 1899 [2]. Percutaneous renal biopsy was first performed by Alwall in 1944 [3]. Iversen and Brun [4] stated that percutaneous renal biopsy is the most useful tool for diagnosing renal diseases causing acute renal failure

(ÁRF). After the publication of the Iversen and Brun study, percutaneous renal biopsy became a diagnostic procedure used increasingly all over the world, making possible the knowledge of diseases previously known only on the basis of autoptical renal sample. The procedure allowed the understanding of the natural history of all renal diseases. In the following years the technique increased its diagnostic potential with the development of immunofluorescence microscopy and electron microscopy. Thus, renal biopsy became a crucial means for establishing the most important knowledge of histopathology, pathogenesis and classification of renal disease [5]. At present with the use of real time ultrasound and automated needles >99% biopsies are diagnostic [6].

There is no doubt that percutaneous renal biopsy is extremely useful in clinical nephrology to establish an accurate diagnosis, to obtain data of prognostic value and to choose the most appropriate treatment for most patients affected by renal disease [7]. Nevertheless, the morbidity and occasional mortality associated with this procedure require a careful evaluation of the risk to benefit ratio for each patient. This evaluation, however, is quite subjective [8,9]. Thus, it is not surprising that the indications for kidney biopsy vary considerably among nephrologists [10,11].

Indications for renal biopsy

1. Rapidly progressive glomerulonephritis failure (RPGN):- In patients with rapid fall of kidney function when an acute inflammation involving small vessels, glomeruli, or interstitium is suspected, renal biopsy should be done. In these circumstances, the clinical diagnosis may be difficult and incomplete. In such a condition, renal biopsy is indicated despite a high risk of complication is the determining factor in identifying potentially treatable diseases.

2. Haematuria: - There is no rule of renal biopsy in patients with isolated haematuria with or without asymptomatic proteinuria. The presence of 75 to 80 per cent of dysmorphic erythrocytes and/or more than 4 to 5 per cent of acanthocytes strongly suggests an underlying glomerular disease. Only renal biopsy can allow a firm diagnosis in these cases

3. Chronic renal failure:- Chronic renal failure represents a contraindication to renal biopsy. However, for patients with moderate renal insufficiency and a normal sized kidney, a kidney biopsy may be indicated to recognize the type of renal disease and the potential reversibility of histological lesions.

4. Non-nephrotic proteinuria:- The indications for renal biopsy in patients with proteinuria less than 1 to 2 g per day, normal renal function, and mild urine sediment abnormalities. Some of them may have orthostatic proteinuria,, others have an underlying nephrosclerosis or a reflux nephropathy causing a secondary focal glomerulosclerosis. However, biopsy is considered if the clinical setting is compatible with a primary glomerular disease.

5. Diabetic nephropathy:- Proteinuric non-insulin-dependent diabetic patients without retinopathy may require renal biopsy. However, non-diabetic renal disease may develop

in diabetic patients. Moreover, a multitude of glomerulopathies may be associated with diabetic nephropathy, including membranous nephropathy [11], minimal change nephropathy [12], acute glomerulonephritis [13], anti-GBM nephritis [14], and IgA nephropathy [15]. These events are particularly frequent in type 1 diabetes mellitus [16]. The indications of renal biopsy in patients with diabetes are. a) The absence of retinopathy or neuropathy in patients with evidence of nephropathy may imply that the underlying pathology is unrelated to diabetes [17]. b) Rapid fall of renal function, and microscopic or macroscopic hematuria [18].

6. Renal disease in SLE:- Renal biopsy permits the correct classification for staging and therefore for treatment of lupus nephritis. In Patients with SLE who have proteinuria, haematuria, and normal or subnormal renal function can have any stage of underlying glomerular lesions. Patients with SLE may present initially with renal disease and only exhibit systemic features of SLE later in their course of illness. This is frequent in patients with an underlying membranous glomerulonephritis. In some patients, the biological markers of SLE may be absent for years and the diagnosis of idiopathic and lupus membranous nephritis can be established only by renal biopsy, which may show mesangial immune deposits, occasional subendothelial deposits, a full house immunofluorescence pattern typical of lupus nephritis. A different situation is represented by those patients who have no clinical evidence of renal involvement despite underlying glomerular disease on histological examination of renal biopsy. This silent nephritis is characterized by mesangial or mild focal proliferative lesions.

7. Post transplant renal biopsy:- There are a number of possible indications for core renal biopsy of a transplanted kidney. In the early posttransplant period, renal biopsy can show whether oligoanuria is caused by acute tubular necrosis or by irreversible lesions, for example, infarction, and hyperacute accelerated rejection. Graft biopsy has also been largely used to differentiate acute rejection from drug toxicity, infections, or other causes of allograft dysfunction. In a later period, transplant biopsy may help in diagnosing whether a slow deterioration of renal function is caused by chronic rejection, by calcineurin-inhibitor toxicity, by recurrent disease, by a viral infection, or by a de novo glomerulonephritis.

Contraindications and precautions for renal biopsy

1. Renal mass:- The presence of polycystic kidney disease is a formal contraindication to renal biopsy. Large cysts and renal neoplasm are not an absolute contraindication if they are well localized, renal biopsy under the guidance of ultrasonography or an open surgical biopsy should be done in these cases.

2. Single kidney:- This condition is generally considered as a contraindication to percutaneous renal biopsy. An exception is the transplanted kidney, which is commonly biopsied both because it is easy to puncture, being almost subcutaneous, and because compressive haemostasis can be carried out. However, technical advances, such as real-time ultrasound guidance and automated biopsy guns, have improved the safety profile of

biopsy in native single kidney. Good results have been obtained in selected cases both in adults [19] and in children [20]. Open biopsy is an alternative option in patients with a single kidney.

3. Chronic renal failure:- Patients with decreased renal function have a high rate of complications. Moreover, useful information cannot be obtained from the biopsy of small, contracted kidneys. For these reasons, renal biopsy should be considered only in patients with almost normal-sized kidneys after careful control of hypertension and correction of coagulation disorders.

4. Urinary tract infection:- Active untreated infection of the upper urinary tract is considered a contraindication to renal biopsy, in view of the potential communication between the collecting system and a possible perirenal hematoma, with consequent catastrophic infection of the hematoma.

5. High blood pressure:- The risk of complications after biopsy is directly related to the degree of elevation of blood pressure. Although normalization of blood pressure with antihypertensive agents may reduce the risk of complications, nevertheless, the transaction of sclerotic vessels is more likely to produce severe hemorrhage. Uncontrolled hypertension should be considered as a high-risk factor for complications.

6. Coagulation disorders:- Hemorrhagic diathesis is a formal contraindication to renal biopsy. Many patients with renal dysfunction present a prolongation of the skin bleeding time associated with normal results on coagulation tests. The risk of hemorrhagic complications after biopsy is high in patients with very prolonged bleeding time. However, in many cases preoperative infusion of desmopressin (0.3 μ mol/kg over 30 min) can achieve normal values of the bleeding time for some hours and allow renal biopsy.

7. Others: - Renal artery aneurysm marked calcified atherosclerosis, perinephric abscess, and horseshoe kidney are generally considered as contraindications to percutaneous renal biopsy. However, in particular cases an open biopsy may be considered if the clinical situation warrants the risk.

Renal biopsy in pregnancy: Renal biopsy before 30 weeks of gestation is not associated with significant complications [21]. However, in the pre- or postpartum period it is often complicated by perirenal hematomas [22]. Thus, biopsy should be considered only if it may offer the opportunity to make a diagnosis other than severe pre-eclampsia in a patient remote from term. Patients with AL amyloidosis may have a factor X deficiency due to binding of this factor to the amyloid tissue deposit [23]. Moreover, vascular amyloid deposits may impair vascular occlusion and vasoconstriction after transaction of vascular structures by biopsy. In view of the increased risk of hemorrhage, patients with amyloidosis should be assessed carefully to rule out possible haemostatic defects. The goal of a renal biopsy should be to maximize the yield of adequate renal tissue while minimizing the risk of complications. Percutaneous renal biopsies have evolved from a blind procedure to a real-time ultrasound-guided needle biopsy. Although some nephrologists still use the FranklinSilverman needle and the Tru-Cut needle

for blind biopsy, several authors have documented that the use of real-time ultrasonography along with the use of an automatic biopsy gun minimizes complications and provides a high yield of adequate tissue for pathologic diagnosis. Cozens and co-workers [24] retrospectively compared a 15-gauge Tru-Cut renal biopsy with ultrasound localization and marking with an 18-gauge, spring-loaded gun renal biopsy under real-time ultrasound guidance. They reported a 79% yield of adequate renal tissue with the blind technique compared with 93% with realtime ultrasound guidance [22]. Similarly, two other comparative studies reported a higher mean number of glomeruli from biopsies obtained under realtime ultrasound compared with those performed blindly [25, 26].

Objectives

The objective of this study was to find out the correlation between indications and histopathology of renal biopsy.

Patients and methods. This prospective study was conducted in department of nephrology Sher-i-kashmir institute of medical sciences a tertiary care hospital. 115 patients who underwent renal biopsy over a period of two and half years between 2010 to 2013. The average admission rate during the period was 800 patients per year

Subjects:- Patients with renal disease were admitted and subjected to renal biopsy in department of nephrology. The information which was collected before biopsy included, Age, Sex, History of illness, Blood Pressure, KFT, Bleeding time clotting time, activated partial thromboplastin time, Partial thromboplastin time, 'Hemoglobin concentration.

Case definition:- Patients who presented with clinical and/or laboratory features of renal disease, whose diagnosis were uncertain with non invasive modalities and fulfilled the requirement for renal biopsy were subjected to renal biopsy the indications for the biopsy were as below:

1. Proteinuria and Hematuria.
2. Subnephrotic Proteinuria.
3. Nephrotic syndrome.
4. ATN not recovering in 4 weeks.
5. Systemic Disease (eg vasculitis).
6. Subnephrotic Proteinuria with azotemia.
7. Post renal transplant azotemia.

Methods:- The patients who were eligible for the study were taken for detailed history and examination according to prescribed proforma. Routine investigations like Hemogram, ESR, Kidney function test, Liver function test, Blood glucose, ECG, Coagulogram, X-ray chest, Microscopic urine examination, USG abdomen, 24hrs urinary protein, were done before Renal biopsy. All patients were subjected to Percutaneous Renal biopsy after ruling out cause of renal disease by other noninvasive methods.

Procedure

Percutaneous renal biopsy was performed with an automated spring loaded device of various size (15 to 22G). The skin and subcutaneous tissue was anesthetized with lidocaine followed by deeper anesthesia with a spinal needle. The depth on some occasions was noted with an ultrasonography and was confirmed with spinal needle. The biopsy needle was then inserted to the depth and engaged if the renal tissue was not obtained a deeper biopsy was performed. The biopsy was repeated until an adequate amount of tissue was obtained (usually three specimens). After the procedure patient was advised to lie flat on bed on his back and no activity was allowed for six hours and was observed for 24hrs for any complication. Patient blood pressure for initial 3hours was monitored every 30 minutes then hourly for 5 hours then 4 hourly for 16 hrs. Patient was monitored for Hematuria, pain, fever, and any other complication post biopsy Hemoglobin was done after 24hrs of biopsy to see for drop in hemoglobin. Biopsy tissue was sent for histopathology and immunohistochemistry. Only light microscopy was done. Patient was revived after one week on OPD basis and USG abdomen was done to rule out AV fistula.

Ethical issues

The research followed the tenets of the Declaration, informed consent was obtained; and the research was approved by the ethical committee of Shere-kashmir institute of medical sciences (SKIMS) Soura Srinagar India.

Statistical analysis

Analysis was performed in SPSS version 16 software and P value less than 0.05 was considered as statistically significant

Results

In this prospective study 115 renal biopsies were performed 70 males (60.9%) and 45 females (39.1%). The mean age of males were 36 ± 14.3 and in females mean age was 29.6 ± 12.8 the most common age group biopsied was between 19-45yrs of age both among males (58.6%) and females (66.7). The number of patients below 18yrs of age were 21 (18.3%), 11 male and 10 female. Patients above the age of 45 were 23 (20%) 18 male and 5 females (Table 1).

Discussion

The present study was conducted to know the relation between indication and histopathology outcome of renal biopsy which would help to have a clinical knowledge of possible cause of renal disorder. The biopsy was done after proper assessment of patients clinical and lab parameters. There are Gross hematuria isolated was only one patient as it is not considered indication for biopsy unless patient insists for diagnosis (Table 2).

- Nephrotic syndrome 25 patients (21.7%).
- Isolated subnephrotic proteinuria 26 patients (22.6%)
- The most common indication for renal biopsy was

Table 1: Age and gender distribution of the Studied Subjects.

Age (yr)	Male		Female		Total	
	n	%	n	%	n	%
≤ 18	11	15.7	10	22.2	21	18.3
19 to 45	41	58.6	30	66.7	71	61.7
> 45	18	25.7	5	11.1	23	20.0
Total	70	60.9	45	39.1	115	100.0
mean ± SD	36.0 ± 14.3 (9, 70)		29.6 ± 12.8 (13, 60)		33.5 ± 14.0 (9, 70)	

n=No. of patients in each gender and N= total No. of patients.

Table 2: Indications for Renal Biopsy in studied patients.

Indications	n	%
Proteinuria and Hematuria	26	22.6
Subnephrotic Proteinuria	26	22.6
Nephrotic syndrome	25	21.7
Acute Renal failure	6	5.2
Systemic Disease	4	3.5
Subnephrotic Proteinuria with azotemia	23	20.0
Post renal transplant azotemia	4	3.5
Gross hematuria	1	0.9

Showing indication of renal biopsy. N=No of patients.

proteinuria and hematuria (Nephritic syndrome) 26 patients (22.6%)

- few studies available on internet related to present study.

ZHENG et al [27] I conducted a retrospective study about indications and histopathologic findings of renal biopsy. A total of 1 419 renal biopsies were performed in 31 years. Mean age was (8.08 ± 3.46) years (6 months-18 years). Major clinical presentations were haematuria (38.8%, 551/1 419) followed by primary nephrotic syndrome (30.9%, 439/1 419) and renal manifestations secondary to systemic diseases (23.8%, 338/1419). Primary glomerulonephritis (PGN) accounted for 63.9% (907/1 419) of the total patients, secondary glomerulonephritis (SGN) 23.2% (329/1 419) and hereditary glomerulonephritis (HGN) 12.1% (172/1 419). Common causes of PGN were IgAN (26.6%, 241/907) (98 out of 241 were diffuse proliferative type) and MCD (23.0%, 209/907) (120 out of 209 with IgM deposition). FSGS only accounted for 3.0% (27/907). The percentage of IgAN was relatively high and that of FSGS was low. In SGN, HSN(47.1%,155/329) (72 out of 155 were focal segmental proliferative type) ranked first and followed by LN (28.6%,94/329) (43 out of 94 were diffuse proliferative LN).In HGN, thin basement membrane nephropathy(TBMN) accounted for 80.8% (139/172) and Alport syndrome accounted for 17.4% (30/172). During 31 years, the composition of PGN decreased while that of HG-N increased. MsPGN and HBV-GN were on the top in period T and decreased in period II and M. IgAN and HSN had a rise in composition. Most haematuria with proteinuria patients had IgAN (42.6%, 84/197) while most isolated microscopic haematuria had TBMN (52.9%, 109/206). Most primary nephrotic syndrome patients especially steroid dependent and frequently relapse (SDITR) had MCD (61.8%, 97/157). The indication of renal biopsy for isolated microscopic

hematuria should be stricter. In our study correlation between histopathology and indication was as shown in table 3 and 4.

- IgA nephropathy was the most common histopathologic diagnosis, 18 (15.7%) out of 115 patients were reported as IgA nephropathy, among them 6 (33%) patients had proteinuria with hematuria, 2 (11.1%) patients subnephrotic proteinuria, 7 (38.9%) patients nephritic syndrome 1 (5.6%) SLE with proteinuria, 1 (5.6%) patient gross hematuria, 1 (5.6%) patient had azotemia with subnephrotic proteinuria respectively.
- Minimal change disease was reported in 12 (10.4%) patients out of them 9 (75%) patients had nephrotic range proteinuria and 3 (25%) had proteinuria with hematuria respectively.
- Nephrosclerosis was reported in 10 (8.7%) patients. out of them 5 (50%) patients had subnephrotic proteinuria 3 (30%) patients had azotemia with subnephrotic proteinuria and 2 (20%) patients had hematuria with proteinuria.
- Lupus nephritis was reported in 8 (7%) patients. All of them were already diagnosed as SLE stage III in 3 patients stage IV in 2 patients and stage V in 3 patients,
- Focal segmental glomerulosclerosis was reported in 9 (7.8%) patients among them 3 (33.3%) patients had subnephrotic proteinuria, 3 (33.3%) patients had

azotemia with subnephrotic proteinuria, 2 (22.2%) patients had nephritic syndrome and 1 (11.1%) patient had hematuria with proteinuria.

- Membranous glomerulonephritis was reported in 8 (7%) patients among them 5 (62.5%) patients had proteinuria and hematuria 2 (25%) had subnephrotic proteinuria and 1 (20%) had nephritic syndrome.
- Mesangiocapillary glomerulonephritis was reported in 8 (7%) of patients among them 3 (37.5%) patients had proteinuria with hematuria 1 (12.5%) patient had subnephrotic proteinuria 4 (50%) patients had azotemia with proteinuria
- Chronic interstitial nephritis was reported in 6 (5.2%) patients, among them 2 (33.3%) patients had subnephrotic proteinuria, 2 (33.3%) patients proteinuria with hematuria, 2 (33.3%) patients had azotemia with proteinuria.
- Membranoproliferative glomerulonephritis was reported in 5 (4.3%) patients among them 3 (60%) patients had subnephrotic proteinuria 1 (20%) had had nephritic syndrome and 1 (20%) had acute renal failure
- Rapidly progressive glomerulonephritis was reported in 5 (4.3%) patients among them 4 (80%) patients had proteinuria with azotemia and 1 (20%) patient had proteinuria with hematuria.
- Acute tubular necrosis was reported in 5 (4.3%) patients among them 2 (40%) patients had proteinuria with hematuria, 2 (40%) patients had acute renal failure and 1 (20%) patient had nephritic syndrome.
- Myeloma nephropathy was reported in 4 (3.5%) patients 2 (50%) patients had subnephrotic proteinuria 1 (25%) patient had acute renal failure and 1 (25%) patient had azotemia with proteinuria.
- Chronic graft rejection was reported in 3 (1.7%) patients all of them had post renal transplant azotemia.
- HSP was reported in 3 (2.6%) patients among them 1 (33.3%) patient proteinuria with hematuria 1 (33.3%) patient had subnephrotic proteinuria and 1 (33.3%) had nephritic syndrome.
- Amyloidosis was reported in 2 (1.7%) patients 1 (50%) patient had proteinuria with hematuria and 1 (50%) patient had nephritic syndrome.
- Wegners granulomatosis, Glomerulosclerosis and diabetic nephropathy was reported in 1 (0.9%) each. They presented with vasculitis, subnephrotic proteinuria with azotemia and hematuria with proteinuria.
- Inconclusive was reported in 6 (5.2%) patients among them 2 (33.3%) patients had subnephrotic proteinuria, 2 (33.3%) patients had nephrotic syndrome, 1 (16.7%) patients had vasculitis with active urinary sediment and 1 (16.7%) post renal transplant azotemia.

Table 3: Histopathology report of renal biopsies

Histopathology	n	%
MCD	12	10.4
MPGN	5	4.3
MGN	8	7.0
Myeloma Nephropathy	4	3.5
IgA Nephropathy	18	15.7
Inconclusive	6	5.2
Acute tubular necrosis	5	4.3
FSGS	9	7.8
CIN	6	5.2
RPGN	5	4.3
Amyloidosis	2	1.7
Chronic Graft Rejection	3	2.6
Wegners Granulomatosis	1	0.9
Lupus Nephritis	8	7.0
Diabetic Nephropathy	1	0.9
Glomerular Sclerosis	1	0.9
HSP	3	2.6
Nephrosclerosis	10	8.71
Mesangiocapillary Glomerulonephritis	8	7.0

Showing histopathology diagnosis and their incidence in our study. The most common diagnosis is IgA nephropathy the second most common diagnosis was MCD, however the diagnosis of MCD was considered in patients with nephritic syndrome and normal histopathology in renal biopsy.

Table 4: showing relationship between biopsy indications and histopathology diagnosis.

Histopathology	Proteinuria and Hematuria		Subnephrotic Proteinuria		Nephritic syndrome		ARF		Systemic Disease		Subnephrotic Proteinuria with azotemia		Post renal transplant azotemia		Gross hematuria	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
MCD	3	25.0	0	0.0	9	75.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
MPGN	0	0.0	3	60.0	1	20.0	1	20.0	0	0.0	0	0.0	0	0.0	0	0.0
MGN	5	62.5	2	25.0	1	12.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Myloma Nephropathy	0	0.0	2	50.0	0	0.0	1	25.0	0	0.0	1	25.0	0	0.0	0	0.0
IgA Nephropathy	6	33.3	2	11.1	7	9	0	0.0	1	5.6	1	5.6	0	0.0	1	5.6
Inconclusive	0	0.0	2	33.3	2	33.3	0	0.0	1	16.7	0	0.0	1	16.7	0	0.0
Acute tubular necrosis	0	0.0	2	40.0	1	20.0	2	40.0	0	0.0	0	0.0	0	0.0	0	0.0
FSGS	1	11.1	3	33.3	2	22.2	0	0.0	0	0.0	3	33.3	0	0.0	0	0.0
CIN	2	33.3	2	33.3	0	0.0	0	0.0	0	0.0	2	33.3	0	0.0	0	0.0
RPGN	1	20.0	0	0.0	0	0.0	0	0.0	0	0.0	4	80.0	0	0.0	0	0.0
Amyloidosis	0	0.0	1	50.0	1	50.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chronic Graft Rejection	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	100.0	0	0.0
Wegners Granulomatosis	0	0.0	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0
Lupus Nephritis	1	12.5	0	0.0	0	0.0	2	25.0	1	12.5	4	50.0	0	0.0	0	0.0
Diabetic Nephropathy	1	100.0	0	0.0	0	0.0	0	0.0	0	0	0	0.0	0	0.0	0	0.0
Diffuse Glomerular Sclerosis	0	0.0	0	0.0	0	0.0	0	0.0	0	0	1	100.0	0	0.0	0	0.0
HSP	1	33.3	1	33.3	1	33.3	0	0.0	0	0	0	0.0	0	0.0	0	0.0
Nephrosclerosis	2	20.0	5	0.0	0	0.0	0	0.0	0	0	3	30.0	0	0.0	0	0.0
Mesangiocapillary Glomerulonephritis	3	37.5	1	0.0	0	0.0	0	0.0	0	0	4	50.0	0	0.0	0	0.0

Mesquita et al. [28], conducted a retrospective study on histopathological findings in renal biopsy Records of 326 adult renal biopsies performed at their hospital from January 1991 till the end of December 2006 were retrospectively examined. Overall, secondary glomerular diseases (SGD) were predominant (39.9%), followed by primary glomerular diseases (PGD) (30.4%), vascular diseases (13.2%) and TIN (6.7%). Total sclerosis of the kidney did not allow histopathological diagnosis in 5.8% of all biopsied kidneys. Focal and Segmental Glomerular Sclerosis (FSGS), IgA Nephropathy (IgAGN) and Minimal Change Disease (MCD) and Membranous Glomerulopathy (MGN) were the most common POD, altogether representing 75.7% of all PGD. FSGS was the most frequent (30.3%), followed by IgAGN (21.2%), MCD (19.1%) and MGN in 15.1%. Vasculitis, HIVAN, diabetic nephropathy and amyloidosis were the most common SGD, altogether representing 90% of all SGD. Immune Mediated Glomerulonephritis (IMGN) were the most frequent (32.3%), followed by HIVAN (16.9%), diabetic nephropathy (14.6%) and amyloidosis (10%). Nephrosclerosis (benign and malignant nephrosclerosis) was the most frequent vascular nephropathy responsible for 79% of all vascular diseases. Thrombotic microangiopathy was seen in 9.3% and atherothrombotic disease in 7% of all vascular diseases. Concerning tubular diseases, chronic TIN accounted for 63.6% of all tubular diseases, followed by light chain-cast nephropathy (22.7%) and acute TIN (13.6%). 13 because of lack of material, 3.4% of all biopsies could not be analyzed.

HAMDY et al. [29], conducted a study on the histopathological profile of Kidney Diseases. The indications

for renal biopsy were categorized into: nephritic syndrome (NS), acute nephritic syndrome, mixed, asymptomatic urinary abnormalities (AUA) or haematuria. Acute renal failure (ARF), chronic renal failure (CRF), accidentally discovered impaired kidney function (IKF), and malignant infiltration. 413 biopsies from native kidneys were analyzed in this study. It was noted that most of the biopsies were done in adults above the age of 18 years, which represented 87.65 % of the biopsies, which suggested either a higher age of onset of the renal diseases especially the glomerular diseases, or a very strict criteria for biopsying the pediatric patients. It was found that the most common indication of renal biopsy was nephrotic syndrome, representing 43.1 % of all the cases, followed by asymptomatic urinary abnormalities (25.18 %) and ARF (15.98 %). Regarding the renal biopsy pattern, MPGN was found to be the most histopathological feature of nephrotic syndrome in this data (43.26), followed by MGN (33.71). The second common cause for the renal biopsy was AUA, representing 25.18 % of the cases. About 49 % out of them showed the pathological diagnosis of MPGN. ARF was the third indication for kidney biopsies, representing 15.98 % of all the biopsies and 19.69% of them had the pathological feature of ATN.

Rahbar et al. [30], conducted a study on histopathology and complications of renal biopsy over a period of 6 yrs from 2003 to 2007. Nephrotic syndrome was the most common indication for biopsy followed by acute renal failure of unknown etiology and nephritic syndrome. Primary glomerular disease was reported in 78 patients (70.2%) and also secondary glomerular disease in 33 patients (29.7%). Among the primary

glomerulonephritis disease, minimal change disease and membranous glomerulonephritis were the commonest findings in children below the age of 16 years. Minimal change disease ranked first in adults whole membranous glomerular disease and focal segmental glomerulosclerosis were more common in the elderly. In all patients lupus glomerular disease was the commonest secondary glomerular disease.

Maya et al. [31], conducted a retrospective study outcomes of renal biopsy on patients undergoing a percutaneous native kidney biopsy during a 2-year period (January 1, 2004 to December 31, 2005). Of 129 renal biopsies, 65 were ultrasound-guided and 64 were performed by the blind technique. All biopsies were performed by nephrology fellows under direct faculty supervision. The two patient groups were comparable in terms of age, sex, race, diabetes, hypertension, serum creatinine, and hematocrit. The mean number of glomeruli per biopsy was higher in the ultrasound-guided group than in the patients with a blind biopsy (18 +/- 9 versus 11 +/- 9, $p = 0.0001$). An inadequate tissue sample requiring repeat biopsy occurred in 0% of the ultrasound-guided biopsies and 16% of the blind biopsies ($p = 0.0006$). Large hematomas requiring vascular intervention or transfusion were less frequent in the ultrasound-guided biopsies (0% versus 11%, $p = 0.006$). The hematocrit 24 hours post biopsy was higher in the ultrasound-guided biopsies when compared with the blind biopsies (32 +/- 5% versus 30 +/- 4%, $p = 0.04$). When compared with blind renal biopsy, real-time ultrasound-guided percutaneous renal biopsy provides a superior yield of kidney tissue and results in fewer hemorrhagic complications. They concluded that Realtime ultrasound-guided renal biopsy is the preferred technique.

The limitations of study were short duration of study and its prospective nature which resulted in small sample size of only 114 patients. There were no ethical errors made during the study as only those patients were subjected to renal biopsy who fulfilled the criteria strictly for renal biopsy and were benefits outweighed the risk.

Conclusion

Renal biopsy is one of the most important diagnostic modality with nephrologists. In our study of 115 patients the indication for renal biopsy was Proteinuria and Hematuria (22%) isolated subnephrotic proteinuria (22.6%) Nephrotic syndrome (21.7) ARP (5; 2%) systemic disease (3.5%) Subnephrotic Proteinuria with azotemia (20%) and post renal transplant azotemia (3.5%). The most common histopathology diagnosis was IgA nephropathy (15.7%) followed by MCD (10.4%) FSGS (7.8%) MGN (7%) Lupus nephritis and RPGN was (5.2%) and (4.3%) respectively. In 5.2% of patients either no tissue was obtained or it was insignificant. I-ISP was reported in 2.6 % of patients, and nephrosclerosis in 7% of patients. The study reveals that there is no alternative to renal biopsy, as is evident from this study that same disease present with different urinary and renal abnormalities.

Limitations of the study

Non availability of electron microscopy and number of

patients is a limitation of our study. However the project was to be completed in two and half years which limited the number of patients.

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Ethical considerations: Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

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