Clinicopathological correlations of biopsy proven renal disease In Minia University Hospital

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Abstract:
Background: Glomerular disease (GD) is one of the most common forms of renal diseases and can have many different clinical presentations. It can present as nephrotic syndrome (NS), nephritic syndrome, rapidly progressive renal failure (RPRF), acute kidney injury (AKI), chronic kidney disease(CKD), macroscopic hematuria (MH), recurrent disease in the post-transplant kidney, as well as isolated proteinuria or hematuria. In any case, a kidney biopsy is needed for the correct characterization of various types of GD.
Aim of the work: To comprehensive information about the demographics, clinical presentation and pattern of kidney diseases diagnosed by renal biopsy in Minia Univrsity Hospital.
Patients and Methods: The study included 104 patients admitted to renal unit at El-Minia university hospital with mean ages 31.65±13.77 years. These patients selected from January 2014 to Augest 2016.This study included 40 patients retospectively from January 2014 to March 2015 and continued prospectively for 64 patients from April 2015 to Augest 2016.
Results: All renal biopsy specimens obtained were prepared as the standard protocol analysis included light microscopy (LM) . In Our Study, the most common renal diseases was Lupus Nephritis (27.9%), followed by membranoproliferative glomerulonephritis (15.4%) , focal segmental glomerulosclerosis (13.5%),tubulointerstitial nephritis (11.5%), amyloidosis (7.7%) , crescentic glomerulonephritis (5.8%), thrombotic microangiopathy (4.8%), vascular nephropathies (3.8%), minimal change disease (3.8%), membranous nephropathy (2.9%), postinfectious glomerulonephritis (1.9%) and diabetic nephropathy (1%).
Conclusion: The most often diagnosed glomerular disease in our study was lupus nephritis which was the main cause of secondary kidney disease followed by membranoproliferative glomerulonephritis and focal segmental glomerulosclerosis.
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Keywords: Clinicopathological; biopsy; renal disease

7-Thin basement membrane disease.

Secondary glomerular diseases:

1-lupus Nephritis.
2-Systemic vasculitis.
3-Amyloidosis.
4-Diabetic Nephropathy.
5-Thrombotic Microangiopathy.
6-Postinfectious Glomerulonephritis.
7-Hereditary nephropaty.
8-Aloprts syndrome.

The diagnostic renal pathology is an integrated process wherein the results of all pathological assessments are correlated with the clinical and the serological data to arrive at the correct diagnosis. Recent advances in the serology and percutaneous renal biopsy (RB) study have proved invaluable for an accurate diagnosis of

Introduction

Glomerular diseases

Diseases involving the renal glomeruli are encountered frequently in clinical practice and are the most common causes of endstage renal disease worldwide ***(Cibrik et al.,1997).***

Glomerulonephritis is defined here as a disease characterized by intraglomerular inflammation and cellular proliferation associated with hematuria.

Classification of glomerular disease:

Primary glomerular diseases:

1. Minimal change disease.
2. Focal segmental glomerulosclerosis.
3. Membranous nephropathy.
4. Membranoproliferative GN.
5. Mesangioproliferative GN.
6-IgA nephropathy.

This group included 25 patients, 9 males (36%) and 16 females (64%) with mean age 31.48 ± 10.81years.

D)Group IV (non-nephrotic proteinuria, hematuria):

This group included 26 patients , 11 males (42.3%) and 15 females (57.7%) with mean age 31.5 ± 15.24 years.

E)Group V(rapid progreeive GN):

This group included 3 patients , one male (33.3%) and two females (66.7%) with mean age 32 ± 13.89 years.

All groups were subjected to:

A)Thorough History Taking:

Personal history for name, age, sex, residence, marital status, occupation and special habits of medical importance as smoking.

Present history of symptoms as fever, repeated vomiting, low oral intake,decrease urine output, puffiness of face,lower limb sewelling, hematuria ,itching ,hair loss were taken.

Past history of blood or blood product transfusion,drugs or previous operation were taken.

B)Thorough Clinical Examination:

General examination included conscious level,puffiness of the face ,lower limb edema.Careful examination of the abdomen to detect organs affection .Other body system affection other than abdomen was examined as well searching for malignancy anywhere or metastasis.

C)Laboratory Investigation:

Blood Sampling Protocol:

-After 12 hour of overnight fasting,7 ml of peripheral venous blood sample was withdrawen from each individual. This sample was divided into three blood collection tubes, one containing ethylene-diamine-tetra acid (EDTA), one tube containing tri-sodium and lastly a plane tube.

-On an EDTA containing tube,1 ml blood was used for determination of complete blood count.

-On a Trisodium citrate containing tube,1.8 ml was used for determination of prothrombin time and concentration.

-On a plane tube , 4 ml blood was left to clot then centrifuged. Expressed serum is used for determination of renal function tests,liver function tests, lipid profile, blood glucose and viral markers.

Complete blood count: It was determined by automated cell counter, Sysmex k-800, TAO Medical Incorporation,Japan.

Chemical analyses: Fasting blood glucose level, renal and liver function tests were done by using auto analyzer kone-lab (20 I), Thermo-electro, clinical chemistery automation systems, Finland.

Lipid profile: The measurement of the triglycerides, HDL Cholesterol and total cholesterol

medical renal diseases, especially the glomerulopathies. To harvest the most advantages from RB studies, many developed countries have established national or regional RB registries. The data from RB registries has helped in understanding the pathoepidemiology of the renal diseases in different parts of the world ***(Mubarak et al.,2013).***

It is well known that the prevalence of biopsy proven renal diseases (BPRD) varies widely depending on a number of factors including the race, age, demography geographic region, socioeconomic conditions, and indication of renal biopsies. The incidence and prevalence of renal diseases also changes over time, as has been amply demonstrated in many studies from around the world ***(Hanko et al,2009).***

There is a variation in the prevalence of the type of GD according to geographical location and race of the study population. IgA nephropathy (IgAN) is the common primary GD in studies from East Asia ***(Zhou et al.,2009)*** as well as in white Europeans and Americans ***(Hanko et al.,2009).*** In contrast, FSGS is the most common GD among African-Americans, South Americans, and in the Middle East ***(Polito et al.,2010).***

Patients and Methods

The study included 104 patients admitted to renal unit at El-Minia university hospital with mean ages 12-65 years. These patients were selected within the period from January 2014 to Augest 2016.This study included 40 patients retospectively from January 2014 to March 2015 and continued prospectively for 64 patients from April 2015 to Augest 2016.

The study was divided into five Groups according to clinical indications for renal biopsies:Nephrotic syndrome,acute kidney injury,non-nephrotic proteinuria,non-nephrotic proteinuria associated with hematuria and rapid progressive GN.

A)Group I(nephritic syndrome):

NS was defined as heavy proteinuria (> 3.5 g/24 hr or 4+ proteinuria) and serum albumin <2.5 g/dL. This group included 41 patients,13 males (31.7%) and 28 females (68.3%) with mean age 30.29 ± 11.82 years.

B)Group II(AKI):

AKI was defined “as rapid(over hours to weeks) and usually reversible decline in GFR occurring, either in the setting of pre-existing normal renal function or with pre-existing renal disease” and RIFLE Criteria was followed to identify these cases. This group included 9 patients,6 males (66.7%) and 3 females (33.3%) with mean age 35.55 ± 17.99 years.

C)Group III (non-nephrotic proteinuria):

check. FBC (Full Blood Count), INR, APTT and APTT ratio were checked and the patient grouped and saved. A urine dipstick should be obtained. If the dipstick was positive for nitrites or leucocytes send MSU. If BP is > 160/90, Additional anti-hypertensive medication may be needed e.g. amlodipine 5mg or atenolol 50 mg (check no asthma).

7. Antiplatelet and anticoagulation therapy were interrupted, the need for bridging therapy with heparin and the timing of admission to hospital pre-biopsy were required.

Biopsy Technique

The Percutaneous Renal Biopsy (PRB)

Percutanous Renal Biopsy was performed under local anesthesia with disposable, automatic, spring–loaded devices using 14-, 16-, or 18-gauge needles (outer diameter of 2.11, 1.65, and 1.27 mm, respectively).

Biopsy Protocol and Specimen Processing

After ultrasound localization of the kidneys, the overlying skin was prepped and draped in a sterile fashion, and a local anesthetic (we use 1% buffered lidocaine) is infiltrated to the depth of the kidney. Post-PRB, we prescribed bed rest for 6 hours, and we measured vital signs every 15 minutes for 2 hours, every 30 minutes for 4 hours, and then, hourly for the remainder of the observation period. A complete blood count was checked 6–8 hours after PRB, and a urine specimen was evaluated for gross hematuria and to confirm voiding before discharge.

The histopathological evaluation included light microscopy (LM). For LM, 3 sections were stained with Hematoxylin and Eosin (H&E), two with periodic acid Schiff (PAS), one with Masson's trichrome, and one with Jones silver methenamine. Further special stains were used as and when required.

Histological categories were classified as follows:

1-Primary glomerulonephritis (PGN) which included 8 groups – minimal change disease (MCD), membranous nephropathy (MN), focal and segmental glomerulosclerosis (FSGS), membranoproliferative glomerulonephritis (MPGN), chronic glomerulonephritis (CGN), Crescentic glomerulonephritis (CreGN), Diffuse proliferative glomerulonephritis (DPGN) and IgA nephropathy (IgAN).

2- Secondary glomerulonephritis (SGN) which included 8 groups: diabetic nephropathy (DN), lupus nephritis (LN), amyloidosis, Goodpasture syndrome (GPS), haemolytic- uremic syndrome (HUS)/ thrombotic microangiopathy (TMA).

3-Tubulointerstitial nephritis (TIN) which included acute TIN, chronic TIN, acute kidney injury/ acute tubular necrosis (AKI/ATN).

were performed with the kits manufactured by Transasia Biomedicals Ltd (In technical collaboration with ERBA diagnostics Mannheim ,Germany).The triglycerides was measured enzymatically by use of Glycerol kinase and glycerol phosphate oxidase method.

Prothombin time and concentrations: were done using option 2 ,Biomerieux , Vitek ,Inc.595 , USA.

Serum viral markers : HCV antibodies and HBV antigens were detected in the serum by radioimmunoassay Humareader-Jermany.

Serum anti nuclear antibody (ANA) level was measured by ELISA technique (positive test if > 1.2U/ml).

Serum anti double stranded DNA (anti dsDNA) level was measured by ELISA technique (positive test if > 20U/ml).

Serum complement 3 and complement 4 (C3,C4) level were measured by ELISA technique (normal C3 range 12-49 U/ml,normal C4 range 63-192 U/ml).

D)Imaging Study:

Abdominal ultrasonography :

With special interest in kidneys size , echogenicity and position. It was done using General Electric ultrasound and convex transducer with a frequency of 3.5 MHz , USA.

E) Renal biopsy:

Procedure:

1. If the patient is seen in Outpatients:

The indication for a biopsy was noted, urinalysis (and urine protein (albumin):creatinine ratio if dipstick proteinuria) and renal function were requested in addition to any other tests relevant to the case.

Check clotting at this point so that any problems can be picked up before the patient is admitted.

Obtain consent in clinic, where possible .

2. Formal ultrasound should have been performed before hand to see that there are two kidneys and their size.

3. At the outpatient visit the need for biopsy is explained to the patient and the benefits and risks of the procedure made clear. For elective biopsies patients should be provided with written information about the biopsy procedure. A careful history should be obtained particularly focussing on a history of a bleeding diathesis and medication.

4. The decision to carry out a renal biopsy must have been agreed with a Consultant.

5. The urgency of the need for the procedure will depend on the clinical presentation.

6. The patient was seen in renal outpatients usually 2 days before the date of the biopsy for a pre-admission

Data were analyzed using Statistical Package for the Social Science SPSS for windos version 20.0(SPSS Inc., Chicago,IL,USA).The continuous variable were expressed as mean ± SD which compared using chi-sequare test.Statistical significance was defined as a probability level of p value <0.05.

Results

A total of 104 biopsy-proven glomerular diseases were recorded over the period of study.

4- Vascular nephropathy (VN) which included benign nephrosclerosis (BNS), malignant nephrosclerosis (MNS), vasculitis and renal cortical necrosis (RCN).

5- Hereditary nephritis comprising of Alport syndrome.

6- End stage renal disease (ESRD), which included biopsies exhibiting severe interstitial fibrosis and tubular atrophy with advanced glomerulosclerosis and arteriosclerosis.

Statistical Analysis:

Table (1): Demographic, clinical and laboratory characteristics of the patients

	Descriptive statistics (n=104)
Males	40(38.5%)
Females	64(61.5%)
Male to female	0.63
Mean age (years)	31.65 ± 13.77
Age range (years)	13-75
Hypertension	17(16.3%)

Males were 40 and females were 64. The mean age of patients was 31.65±13.77 years. and Male: Female ratio was 0.63 as shown in the table (1).

Table (2):The clinical indications for renal biopsies in the patients

Clinical indications	**Descriptive statistics n (%)**
Nephrotic syndrome	41(39.4%)
Acute kidney injury	9(8.7%)
Non-nephrotic proteinuria	25(24%)
Non-nephrotic proteinuria,hematuria	26(25%)
Rapidly progressive GN	3(2.9%)

The indications for Renal Biopies in our study are shown in The Table (2) . The most common indication for renal biopsy was Nephrotic Syndrome (39.4%), followed by Non-nephrotic proteinuria, hematuria (25%), Non-nphrotic proteinuria (24%), Acute kidney injure (8.7%) and Rapidly progressive glomerulonephritis (2.9%).

The contribution of the various glomerular syndromes to the performance of kidney biopsy is presented in Figure (1)

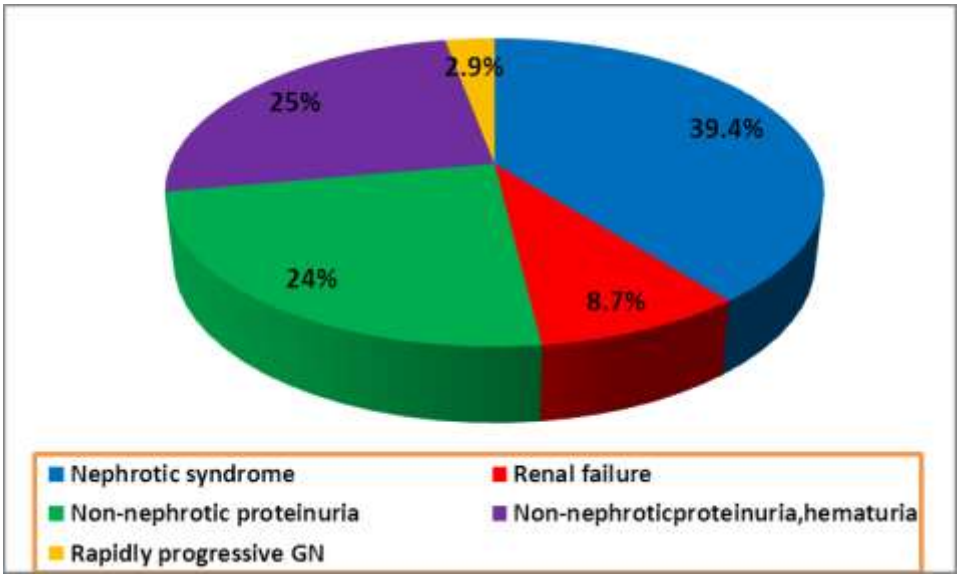

Figure (1): Spectrum of various clinical syndromes

Table (3):Demographic and laboratory characteristics of patients in each clinical syndrome

Variable	Nephrotic syndrome (n=41)	AKI (n=9)	Non-nephrotic proteinuria (n=25)	Non-nephrotic proteinuria, hematuria (n=26)	Rapid progressive GN (n=3)
Age	30.29 ± 11.82	35.55 ± 17.99	31.48 ± 10.81	31.5 ± 15.24	32 ± 13.89
Gender (males)	13(31.7%)	6(66.7%)	9(36%)	11(42.3%)	1 (33.3%)
Hypertension	8(19.5%)	2(22.2%)	1(4%)	6(23.1%)	0(0%)
Serum creatinine (mg/dL)	4.11 ± 2.02	12.4 ± 6.54	1.06 ± 0.67	4.13 ± 3.87	3.83 ± 1.71
Serum albumin (g/dL)	2.64 ± 0.75	2.95 ± 0.95	2.85 ± 0.86	2.77 ± 0.73	2.06 ± 0.25
Hemoglobin (g/dL)	9.08 ± 2.32	8.47 ± 2.02	9.69 ± 2.51	8.46 ± 2.09	6.36 ± 2.05
24-h urinary protein (g)	7.48 ± 3.73	1.76 ± 1.24	1.44 ± 1.05	1.59 ± 0.99	2.26 ± 1.75

The demographic and baseline characteristics of each of these glomerular syndromes are described in The Table (3).

Table (4) Percentage of renal biopsy diagnoses from the patients

Renal Diseases	Number	Overall percentage
Minimal change disease (MCD)	4	3.8%
Focal segmental glomerulosclerosis (FSGS)	14	13.5%
Membranous nephropathy (MN)	3	2.9%
Lupus nephritis (LN)	29	27.9%
Membranoproliferative glomerulonephritis (MPGN)	16	15.4%
Postinfectious glomerulonephritis (PIGN)	2	1.9%
Crecentic glomerulonephritis (CresGN)	6	5.8%
Amyloid	8	7.7%
Diabetic nephropathy (DN)	1	0.96%
Vascular nephropathies (VN)	4	3.8%
Tubulointerstitial N	12	11.5%
Thrombotic microangiopathy	5	4.8%

In Our Study, The most common renal diseases was Lupus Nephritis (27.9%), followed by Membranoproliferative glomerulonephritis (15.4%) , Focal segmental glomerulosclerosis (13.5%),Tubulointerstitial nephritis (11.5%), amyloidosis (7.7%) , Crescentic glomerulonephritis (5.8%), Thrombotic microangiopathy (4.8%), Vascular nephropathies (3.8%), Minimal change disease (3.8%), Membranous nephropathy (2.9%), Postinfectious glomerulonephritis (1.9%) and Diabetic nephropathy (0.96%) as shown in the table (4) and pictures of LM of some renal diseases as shown in figures (2,3,4,5).

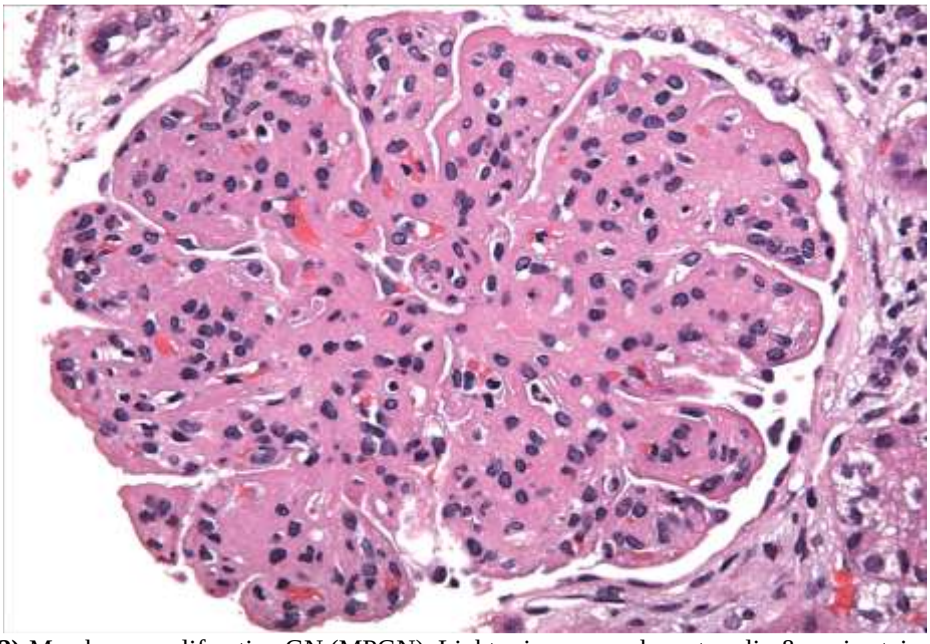

Figure (2): Membranoproliferative GN (MPGN). Light microscopy hematoxylin & eosin stain. Reprinted from Glen Markowitz, with permission.

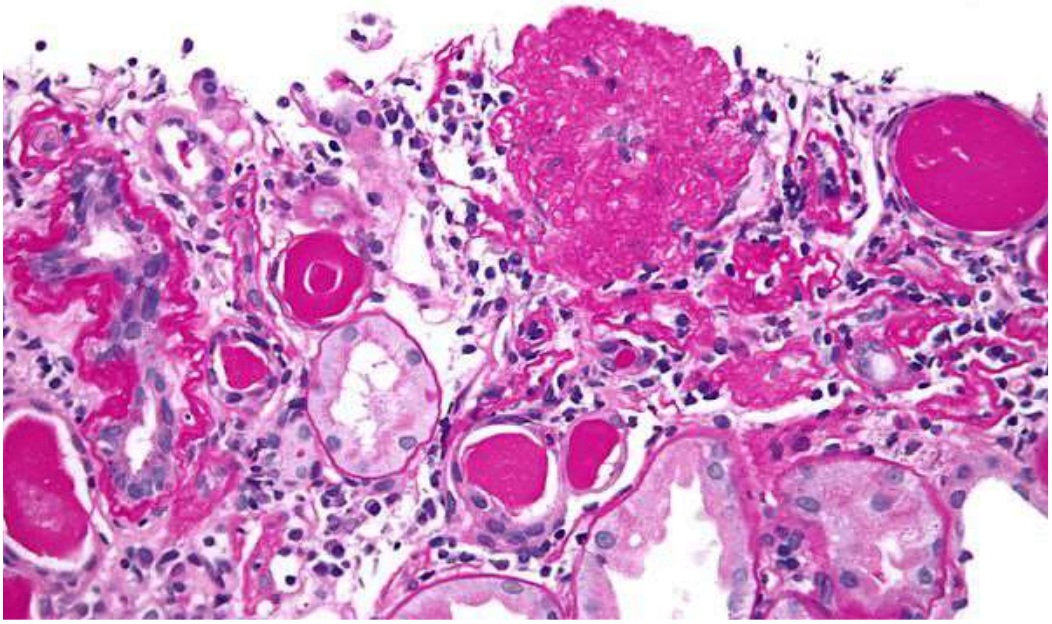

Figure (3): Micrograph of the collapsing variant of FSGS (collapsing glomerulopathy). A collapsed glomerulus is seen at the top, rightof-centre. PAS stain. Kidney biopsy.

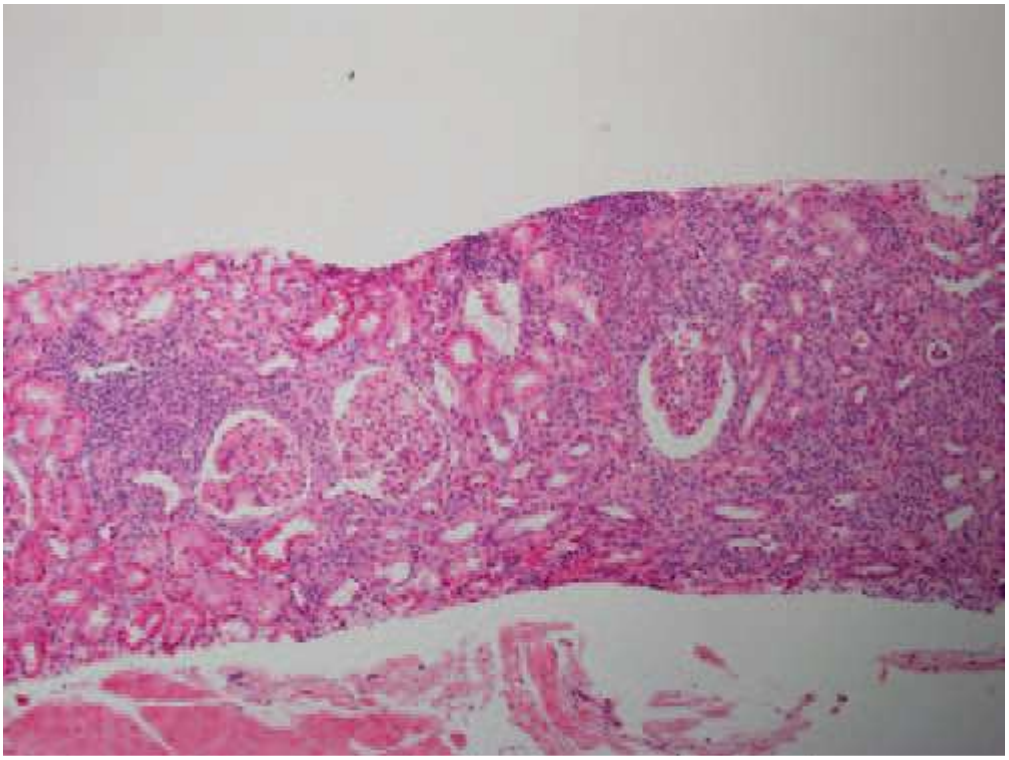

Figure (4): Interstitial inflammatory infiltrates in a case of drug induced acute interstitial nephritis (AIN; hematoxylin and eosin original magnification _10).

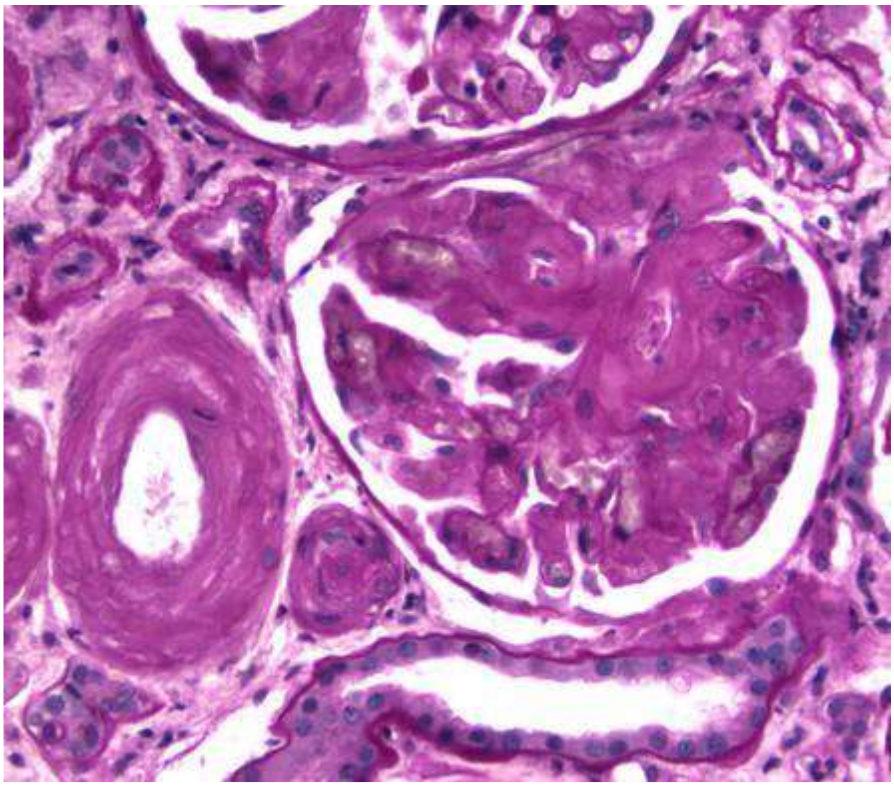

Figure (5): Picture of glomerulus with Amyloid.

Table(5): Renal disease spectrum according to the age of presentation

Biopsy diagnosis	Total	Age groups		
		12-17 years (n=9)	18-59 years (n=92)	≥ 60 years (n=3)
Minimal change disease (MCD)	4(3.8%)	0(0%)	4(4.3%)	0(0%)
Focal segmental glomerulosclerosis (FSGS)	14(13.5%)	1(11.1%)	13(14.1%)	0(0%)
Membranous nephropathy (MN)	3(2.9%)	0(0%)	3(3.3%)	0(0%)
Lupus nephritis (LN)	29(27.9%)	3(33.3%)	26(28.3%)	0(0%)
Membranoproliferative glomerulonephritis (MPGN)	16(15.4%)	1(11.1%)	14(15.2%)	1(33.3%)
Postinfectious glomerulonephritis (PIGN)	2(1.9%)	1(11.1%)	1(1.1%)	0(0%)
Crecentic glomerulonephritis (CresGN)	6(5.8%)	1(11.1%)	5(5.4%)	0(0%)
Amyloid	8(7.7%)	1(11.1%)	7(7.6%)	0(0%)
Diabetic nephropathy (DN)	1(1%)	0(0%)	1(1.1%)	0(0%)
Vascular nephropathies (VN)	4(3.8%)	1(11.1%)	2(2.2%)	1(33.3%)
Tubulointerstitial N	12(11.5%)	0(0%)	11(12%)	1(33.3%)
Thrombotic microangiopathy	5(4.8%)	0(0%)	5(5.4%)	0(0%)

Renal Diseases were also classified according to the age of presentation (12,17 years, 18,59 years, and ≥ 60 years. All the Glomerular Diseases were most commonly seen in adults as shown in the table (5).

Table (6): Renal disease spectrum according to gender

Biopsy diagnosis	Sex	
	Males (n=40)	Females (n=64)
Minimal change disease (MCD)	1(2.5%)	3(4.7%)
Focal segmental glomerulosclerosis (FSGS)	10(25%)	4(6.2%)
Membranous nephropathy (MN)	0(0%)	3(4.7%)
Lupus nephritis (LN)	4(10%)	25(39.1%)
Membranoproliferative glomerulonephritis (MPGN)	7(17.5%)	9(14.1%)
Postinfectious glomerulonephritis (PIGN)	1(2.5%)	1(1.6%)
Crecentic glomerulonephritis (CresGN)	2(5%)	4(6.2%)
Amyloid	5(12.5%)	3(4.7%)
Diabetic nephropathy (DN)	0(0%)	1(1.6%)
Vascular nephropathies (VN)	1(2.5%)	3(4.7%)
Tubulointerstitial N	8(20%)	4(6.2%)
Thrombotic microangiopathy	1(2.5%)	4(6.2%)

Renal Diseases were also classified according to the gender and the Lupus nephritis was seen predominantly in female patient with a female to male ratio of 39.1:10 .

Focal segmental glomerulosclerosis, Amyloid, Tubulointerstitial Nephritis were seen more in male patients with a male to female ratio of 25:6.2,12.5:4.7 and 20:6.2 respectively as in the table (6) and figure (2).

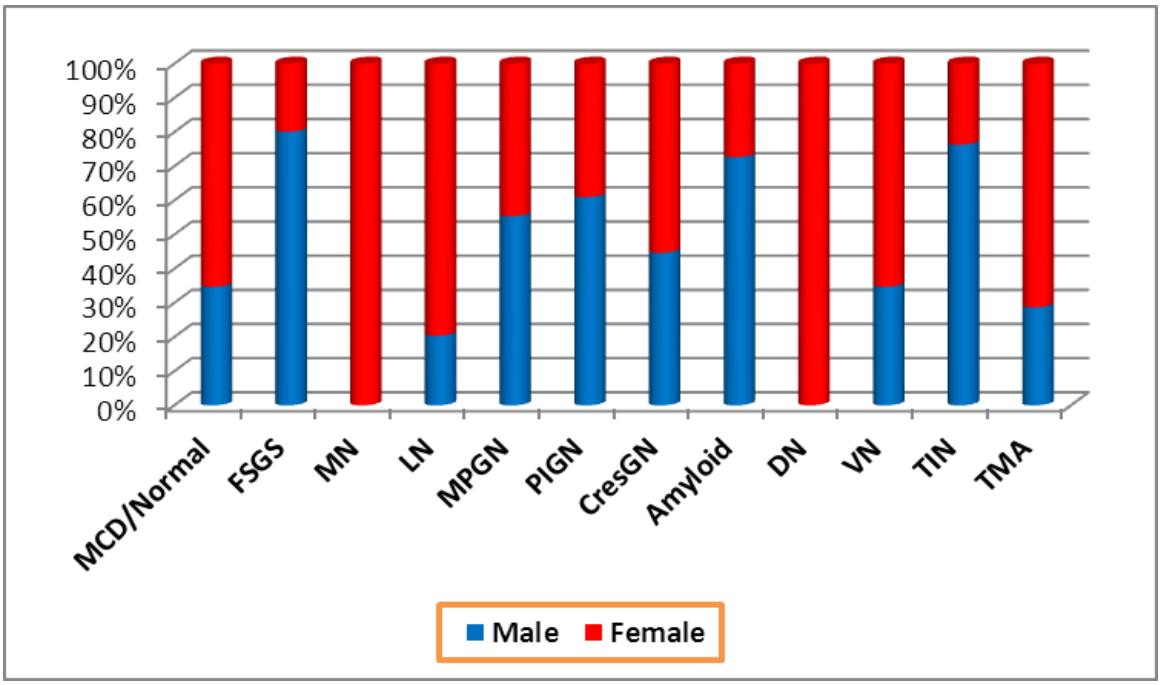

Figure (6): Gender-specific distribution of common renal disease

Table (7):Spectrum of renal diseases and distribution in various serum creatinine levels

Biopsy diagnosis	Total	Serum creatinine		
		<1.5 mg/dL	1.5-3 mg/dL	≥3 mg/dL
		(n=43)	(n=18)	(n=42)
Minimal change disease (MCD)	4(3.8%)	4(9.3%)	0(0%)	0(0%)
Focal segmental glomerulosclerosis (FSGS)	14(13.5%)	5(11.6%)	4(22.2%)	5(11.9%)
Membranous nephropathy (MN)	3(2.9%)	1(2.3%)	1(5.6%)	1(2.4%)
Lupus nephritis (LN)	29(27.9%)	13(30.2%)	4(22.2%)	12(28.5%)
Membranoproliferative glomerulonephritis (MPGN)	16(15.4%)	9(20.9%)	3(16.6%)	4(9.5%)
Postinfectious glomerulonephritis (PIGN)	2(1.9%)	1(2.3%)	0(0%)	1(2.4%)
Crecentic glomerulonephritis (CresGN)	6(5.8%)	2(4.7%)	1(5.6%)	3(7.1%)
Amyloid	8(7.7%)	4(9.3%)	0(0%)	4(9.5%)
Diabetic nephropathy (DN)	1(1%)	0(0%)	1(5.6%)	0(0%)
Vascular nephropathies (VN)	4(3.8%)	0(0%)	2(11.1%)	2(4.8%)
Tubulointerstitial N	12(11.5%)	3(6.9%)	1(5.6%)	8(19%)
Thrombotic microangiopathy	5(4.8%)	1(2.3%)	2(11.1%)	2(4.7%)

The Renal Diseases were also studied based on the serum creatinine values. They were divided in to three groups of serum creatinine: <1.5 mg/dL, 1.5 3 mg/dL, and ≥ 3 mg/dL as shown in the table (7).

Table (8):Frequency distribution of patients according to ISN/RPS classification of lupus nephritis

ISN/RPS classification	Number	Percent
Class I	0	0%
Class II	0	0%
Class III	7	24.10%
Class IV	18	62.10%
Class V	4	13.80%
Class VI	0	0

Lupus Nephritis is the most common cause of Secondary glomerular diseases. In Our Study we found 18 patients (62.1%) belonged to ISN/RPS class IV, 7 patients belongd to INS/RPS class III and 4 patients belonged to ISN/RPS class V as in the Table (8) and LM pictures of class III, class IV and class V as shown in figures (7,8,9,10).

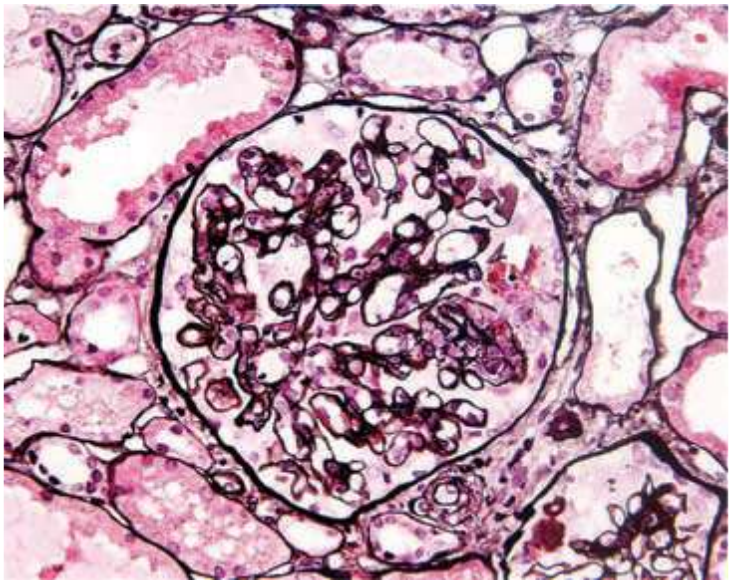

Figure (7): Lupus nephritis class III (A). Light micrograph showing a glomerulus with segmental endocapillary hypercellularity, mesangial hypercellularity, capillary wall thickening and early segmental capillary necrosis (methenamine silver).

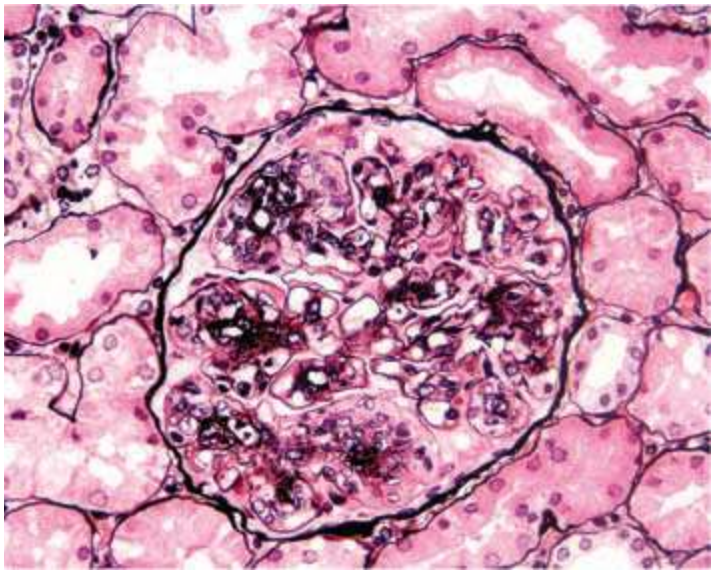

Figure (8): Lupus nephritis class IV-G (A). Light micrograph showing a glomerulus with global involvement of endocapillary and mesangial hypercellularity and matrix expansion, influx of leukocytes, and occasional double contours (methenamine silver).

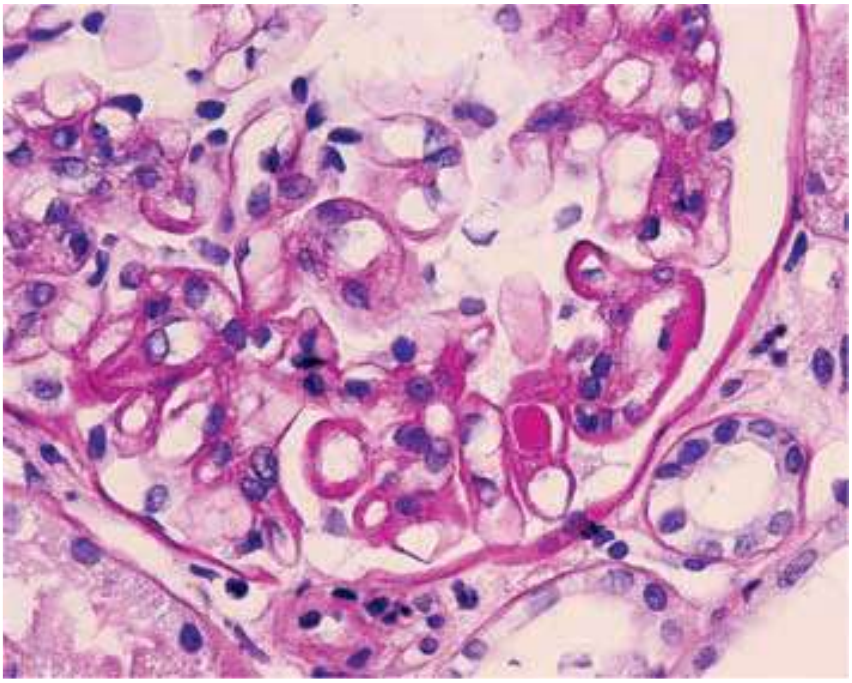

Figure (9): Lupus nephritis class IV-S (A). Segment of a glomerulus showing endocapillary hypercellularity, capillary wall double contours, wireloop lesions and hyaline thrombi [periodic-acid Schiff (PAS)].

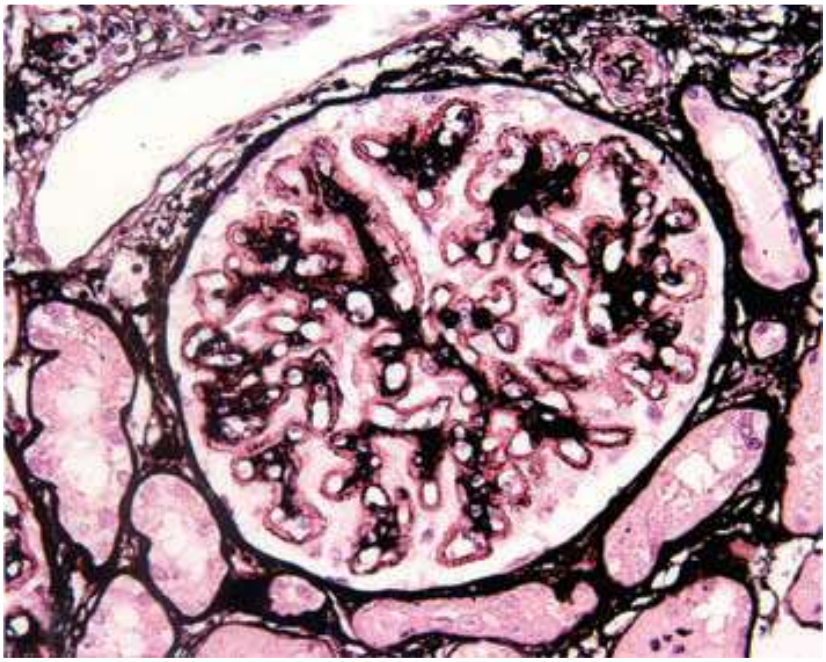

Figure (10): Lupus nephritis class V. Glomerulus with advanced stage lupus membranous nephropathy characterized by massive subepithelial accumulation of immune deposits (IF, full house) and interdigitating spike formation (methenamine silver).

Table (9):Comparison of some common diseases in our series with other studies

Variables	Present Study	Pakistan	Germany	Serbia	Italy	Brazial	Romania	Korea
Minimal change disease (MCD)	3.8	0.079	0.16	0.078	0.07	0.155	0.026	0.209
Focal segmental glomerulosclerosis (FSGS)	13.5	0.29	0.13	0.189	0.15	0.246	0.172	0.075
Membranous nephropathy (MN)	2.9	0.235	0.14	0.189	0.25	0.207	0.276	0.167
Lupus nephritis (LN)	27.9	0.441	-	0.75	0.2	0.424	0.266	0.074
Membranoproliferative glomerulonephritis (MPGN)	15.4	0.015	0.07	0.1	0.06	0.042	0.293	0.053
Postinfectious glomerulonephritis (PIGN)	1.9	-	-	0.02	0.04	0.0545	-	-
Crecentic glomerulonephritis (CresGN)	5.8	0.053	0.08	0.051	0.04	0.017	0.095	-
Amyloid	7.7	0.421	-	0.064	0.2	0.062	0.1	-
Diabetic nephropathy (DN)	1	0.081	0.25	-	0.15	0.101	-	0.234
Vascular nephropathies (VN)	3.8	0.039	0.12	0.044	0.047	0.039	0.009	-
Tubulointerstitial N	11.5	0.1165	0.09	0.03	0.053	0.022	3.35	-

Table (9):Comparison of some common diseases in our series with other studies

Variables	Present Study	Oman	Bahrain	Morocco	Saudia Arabia
Minimal change disease (MCD)	3.8	0.246	0.3	0.26	18.3
Focal segmental glomerulosclerosis (FSGS)	13.5	0.307	0.238	0.094	18.3
Membranous nephropathy (MN)	2.9	0.177	0.135	0.23	20.1
Lupus nephritis (LN)	27.9	0.985	0.389	0.45	40.7
Membranoproliferative glomerulonephritis (MPGN)	15.4	0.02	0.143	0.17	-
Postinfectious glomerulonephritis (PIGN)	1.9	0.065	0.03	0.045	-
Crecentic glomerulonephritis (CresGN)	5.8	-	0.027	0.06	-
Amyloid	7.7	0.015	0.027	0.19	33.3
Diabetic nephropathy (DN)	1	-	0.319	0.15	-
Vascular nephropathies (VN)	3.8	-	-	-	1.1
Tubulointerstitial N	11.5	-	0.131	-	-

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There are regional variations as well as change in the spectrum of presentation of renal diseases over time as is seen in registry data from various parts of the world. The Table (9) summarizes data from us and other countries. As is clear from this table , even among studies originating from the regional centers, there is a variation in presentation of various glomerular diseases.

Discussion

This study provides comprehensive information about the demographics, clinical syndromes and pattern of kidney diseases diagnosed by renal biopsy during a period from January 2014 to Augest 2016. The clinicopathological correlations are of paramount importance in the diagnostic renal pathology. It is well known that the different renal diseases present with different clinical syndromes, and this can help in the diagnosis of a particular disease, but there is significant overlap in the presenting features, hence the need for clinicopathological correlation remains ***(Mubarak et al,2009).***

Percutaneous Renal Biopies have proved extremely useful in diagnosing, managing and predicting the ultimate outcome of the medical diseases of the kidney ***(Rivera et al,2004).***

In Our study, indications for kidney biopsy included Nephrotic Syndrome, followed by Non-nephrotic proteinuria and hematuria,Non-nphrotic proteinuria,acute kidney injure and rapidly progressive glomerulonephritis,similar to other studies ***(Elkhatib et al,2012).***

Our data showed that nephrotic syndrome was the most frequent clinical presentation at all age groups, accounting for 39.4% of all cases. This is similar to that reported in many studies around the world, including India and Pakistan **(*Covic et al,2006).***

Conversely, studies from Japan and Italy reported a higher frequency of asymptomatic urinary abnormalities (AUA), which is quite different from ours ***(Gesualdo et al,2004).***

In our study, secondary glomerulopathies were more common than the primary ones. This goes against the overwhelming majority of results presented in the literature ***(Pinçon et al,2010).***

In fact, lupus nephritis was more frequent among women than men (25 women and 4 men) in our study . This result is in agreement with the Paulista Registration of Glomerulonephritis and most of the series studied, in which it is first among secondary glomerulopathies ***(Polito et al,2010).***

Lupus Nephritis (27.9%) was the most common cause of Secondary Glomerular Diseases. In the present study, we found that ISN/RPS class IV was the most frequent, representing about 62.1% of the total cases.

The underlying etiology of renal diseases is variable across the world. In our study, the most common cause was Lupus nephritis (27.9%) followed by membranoproliferative glomerulonephritis (15.4%) followed by focal segmental glomerulosclerosis (13.5%), tubulointerstitial nephritis (11.5%), amyloidosis (7.7%), crescentic glomerulonephritis (5.8%),vascular nephropathy (3.8%),minimal change disease (3.8%) and membranous glomerulonephritis (2.9%).

However, Membranoproliferative glomerulonephritis was the second commonest glomerular disease in our study as found in Nepal and a high frequency was found in Romania (29.3%), attributable to the higher prevalence of infectious diseases like streptococcal infection and Hepatitis B and C ***(Volovat et al,2013).***

On the other hand, Serbia (18.9%) reported Membranous nephropathy as the most common cause of Nephrotic syndrome and in Brazil (20.7%),followed by Focal segmental glomerulosclerosis, followed by Minimal change disease and Membranous nephropathy ***(Polito et al.,2010).***

The older literature cited Membranous glomerulonephritis as the most common primary glomerular diseases in adults, but most studies have found a declining prevalence of membranous glomerulonephritis and a corresponding rise in the prevalence of focal segmental glomerulosclerosis in adults. A review of different literatures reveals that most of the studies have shown membranous glomerulonephritis to be the third or fourth common cause of primary glomerular diseases ***(Lei-shi,2004).***

However, membranous glomerulonephritis is still common in some regions of Asia, Europe and America ***(Polito et al.,2010).***

Amyloidosis was seen in 8 cases (7.7%), in our study. This is comparable to other studies from other Indian centers (1.67%) ***(Polito et al.,2010).***

There was a high prevalence of amyloidosis (mostly secondary) in the study from Pakistan. This was attributed to the high endemicity of tuberculosis in their study population ***(Reshi et al.,2008).***

The prevalence of Debatic nephropathy (1%) was low. Debatic nephropathy is usually diagnosed without a renal biopsy and we diagnosed many cases clinical without renal biopsy.

The vascular diseases (3.8%) were also less frequent in almost all studies ***(Alwahaibi et al.,2013).***

Tubulointerstitial nephritis are generally diagnosed based on clinical data and other less invasive procedures rather than renal biopsy, accounting for their less frequency in many studies ***(Naumovic,2009).***Our study showed that the percentage of TIN (11.5%).

In contrast to this, it is common in European countries Estonia (35.5%), West Germany(26%) and some East Asian countries (Japan, Korea) (47.4%-38.2%) ***(Riispere et al.,2012)***

Conclusion

Our study provides important information on the epidemiology of renal diseases in patients admitted to El-Minia University Hosipital. The most frequent indication for kidney biopsy in our study was Nephrotic syndrome. The most often diagnosed glomerular disease in our study was lupus nephritis which was the main cause of secondary kidney disease followed by membranoproliferative glomerulonephritis and focal segmental glomerulosclerosis. Further large studies using all methods of examination including LM, IF, and EM with follow-up, response to treatment and survival analysis are recommended.

Conflict and interest: none
None financial

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