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Research Article

Pattern of Different Glomerular Diseases at Ain Shams University Hospital, in Egypt. A Six Months Prospective Study.

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Abstract

Introduction*;** Glomerular diseases are considered one of the most important public health problems worldwide that represents a great economic burden especially in developing countries. In developing countries, there is lack of data and registration regarding glomerular diseases. Therefore, this study was done to highlight the importance of data registry for glomerular diseases in Egypt, to be aware of the medical and economic burden we face annually. ***Aim of the work; To study the incidence of different glomerular diseases newly diagnosed over six months presented to the nephrology department at Ain shams university hospitals. ***Patients & methods*;** This work was performed upon all patients presented with newly diagnosed glomerular diseases, at Ain Shams University Medical Hospitals over 6 months. For all patients, the following was done: Full history, complete physical examination, pelvi-abdominal ultrasound, serum urea, creatinine, urine analysis, 24 hrs urinary proteins, complete blood cell count, ESR, serological markers, viral markers & renal biopsy whenever indicated. ***Results;*** 409 patients with newly diagnosed glomerular diseases were recruited within 6 months. The most common age group was between 20-50 years old with female predominance, 138 patients (33.74%) with primary glomerulopathies & 271 patients (66.26%) with secondary glomerulopathies. As regards primary glomerulopathies, FSGS was the most common (28.26%), followed by MPGN (21.74%), MCD (13.77%), and MGN (13.04%). As regards secondary glomerulopathies, lupus nephropathy (36.40%) was the most common, followed by diabetic nephropathy (28.62%), glomerulonephritis secondary to chronic liver disease (14.13%).Only (46.94%) had active urinary sediments, (50.37%) had a proteinuria level between 1 gm-3.5 gm/24h, (81.17%) were anaemic, ANA and Anti-ds DNA were positive in 103(58.52%) patients, C3 was consumed in 136 patients (76.40%) and C4 was consumed in 133 patients (74.72%), (42.79%) were hypertensives, 28.85% had a rheumatological disease, diabetes mellitus in (22.74%), chronic liver disease in (6.85%), As regard the clinical presentation, (30.81%) patients presented with nephrotic syndrome, followed by acute nephritic syndrome (n=91/22.25%), asymptomatic proteinuria (n=79/19.32%), while (1.96%) presented with rapidly progressive GN. ***Conclusion*;** This study revealed that among chronic kidney disease patients presenting to Ain Shams University hospitals within 6 months, 409 had newly diagnosed glomerular diseases, mostly secondary to LN, DM & viral hepatitis, Therefore a high degree of clinical suspicion is required so that a quick diagnosis can be established and treatment initiated before reaching ESRD.

Keywords: incidence, glomerulopathies, Egypt, diabetic, lupus, viral hepatitis.

Introduction

Glomerular diseases are a frequent etiology of chronic kidney disease, specially in the developing countries.(1). Epidemiological studies of glomerular diseases, even when conducted regionally, are important because they contribute to better understanding of the incidence of those pathologies and allow the adoption of differentiated strategies aiming at new forms of prevention and treatment ***(2).***

Some glomerular diseases predominate in underdeveloped or developing countries, and knowing their epidemiology can lead us to focus research efforts on such glomerulopathies. Some of them are disappearing in developed countries, although still relatively common in developing countries, such as membranoproliferative glomerulonephritis. (3).

Aim of the work

To study the incidence of different glomerular diseases presented to the nephrology department at Ain shams university hospitals, to be aware of the medical and economic burden we face annually.

Patients & methods

A. Patients

All patients presented with newly diagnosed glomerular diseases, admitted to the nephrology department as well as in the outpatient clinics, at Ain Shams University Medical Hospitals in Cairo, Egypt, were recruited during a eriod of six months starting from 1/04/2010 to 30/09/2010.

B. Methods

For all patients, the following was done:

1- Full history.
2- Complete physical examination.
3- Pelvi-abdominal ultrasound.
4- Laboratory investigations in the form of:

Kidney function tests (serum creatinine, blood urea nitrogen, serum k, Na)
Complete urine analysis, patients with urine analysis showing WBC > 4/HPF, RBCs> 3/HPF, RBC or RBC casts were considered as having active urinary sediments. Otherwise, it is bland urine.
CBC, ESR. Patient with Hemoglobin level less than 12 g% in females &13 g% in males were considered anemic. Normal WBC count (4-11.000cmm), patients with less than 4.000/cmm WBC were considered leucopenic while those with WBC >11/cmm were considered having leucocytosis. Normal platelet count is (150-450)/cmm, patients with platelet count < 150.000/cmm were considered thrombocytopenic.
Twenty four hours urinary proteins & accordingly patients were classified into 3 groups; patients with less than 1 gm/24h, patients with 1 gm-3.5 gm/24h & those with more than 3.5 gm/24h.

Serological investigations as ANA, Anti-ds DNA, C3, C4, anticardiolipin, lupus anticoagulant, P-ANCA, C-ANCA, cryoglobulins & hepatic viral markers according to clinical indications.

Renal biopsy & histopathological examination when indicated. Biopsies were evaluated by light microscopy using the 2004 classification of lupus nephritis as well as NIH activity and chronicity indices. Immunologic examination using IgG, IgM, IgA and C3 were done as well as electron microscopic examination.

Patients excluded from having renal biopsy (exclusion criteria):

1- Any obvious glomerular disease not essentially diagnosed by biopsy e. g diabetic nephropathy and hypertensive kidney disease.
2- Shrunken kidneys.
3- Lupus nephritis on dialysis.

Statistical Methodology

SPSS-windows-version (8) was used for analysis of this data as follow: Description of quantitative variables in the form of mean, standard-deviation and range, Description of qualitative variables in the form of frequency and-percentage,t-student test was used to compare quantitative variables ,Chi-square test used to compare qualitative variable.

Results

Data from 409 patients with newly diagnosed glomerular diseases were recruited, 220 (53.79%) were females (P-value =0.125), the most common age group was between 20-50 years representing (n=204/49.88%) (P-value =0.000), with a positive family history of renal disease only in (n=19/4.65%) (P-value =0.000), 192 patients (46.94%) had active urinary sediments, 206 (50.37%) had a proteinuria level between 1 gm-3.5 gm/24h, followed by proteinuria more than 3.5 gm/24h (n=173/42.30%) (P-value =0.000). Three hundreds & thirty two patients (81.17%) were anaemic (P-value =0.000) **(Table 1)**.

Table (1): Demographic and laboratory data of 409 patients with newly diagnosed glomerular diseases.

Demographic and laboratory data		N	%	Chi-square	
				X^2	P-value
Sex	Male	189	46.21	2.350	0.125
	Female	220	53.79		
Age	age(less than 20)	83	20.29	55.956	0.000
	age(20-50)	204	49.88		
	Age (more than 50)	122	29.83		
Family history	Positive	19	4.65	340.169	0.000
	Negative	390	95.35		
Urinary Sediment	Active urinary sediments	192	46.94	1.528	0.216
	Bland urine	217	53.06		
Proteinuria	More than 3.5 gm/24h	173	42.30	128.396	0.000
	1 gm-3.5 gm/24h	206	50.37		
	less than 1 gm/24h	30	7.33		
Haemoglobin%	Normal	77	18.83	158.985	0.000
	anemic	332	81.17		

C3&C4 were done for 176 patients upon clinical indication and the results showed that C3 was consumed in 136 patients (76.40%) and C4 was consumed in 133 patients (74.72%) **(Table2)**. Among patients with consumed C3, 90 were lupus nephritis, 39 with MPGN, 4 patients with HCV associated cryoglobulinaemia and 3 patients with post-infectious GN, while in patients with consumed C4, 87 with lupus nephritis, 39 with MPGN, 4 patients with HCV associated cryoglobulinaemia and 3 patients with post-infectious GN.

Table (2): Results of ANA, anti-ds DNA and complement in 176 patients with newly diagnosed glomerular diseases

ANA, Anti ds DNA, C3&C4		N	%	Chi-square	
				X^2	P-value
ANA	Positive	103	58.52	9.091	0.003
	Negative	73	41.48		
Anti ds DNA	Positive	103	58.52	9.091	0.003
	Negative	73	41.48		
C3	Normal	42	23.60	49.640	0.000
	Consumed	136	76.40		
C4	Normal	45	25.28	43.506	0.000
	Consumed	133	74.72		

Renal biopsy was performed for 270 patients, of which 103 (38.15%) patients were found to have lupus nephritis, followed by membranoproliferative GN (n =39/ 14.44 %), focal & segmental Glomerulosclerosis (n=39/14.44%), minimal change disease (n=19/7.04%), membranous GN (n=18/6.67%), IgA nephropathy (n=13/4.81%), amyloidosis (n=9/3.33%), mesangio-proliferative GN (n=8/2.96%) , haemolytic uraemic syndrome (n=7/ 2.59%), immune complex crescentic GN (n=6/2.22%), post-infectious diffuse proliferative GN (n=3/1.11%), thin basement membrane disease (n=3/1.11%) and alport's syndrome (n=3/1.11 (p-value=0.000) **(Table 3)**.

Table (3): The number and percent of patients with each histopathological diagnosis of 270 renal biopsy done during the study period

Pathological diagnosis		N	%
1-Lupus nephritis		103	38.15
LN class IV		42	15.56
LN class III		29	10.74
LN class II		24	8.89
LN class V		4	1.48
LN combined class V, III		2	0.74
LN combined class V, IV		1	0.37
LN class VI		1	0.37
2-Membranoproliferative GN		39	14.44
3-Focal&segmental Glomerulosclerosis		39	14.44
4-Minimal change disease		19	7.04
5-Membranous GN		18	6.67
6-IgA nephropathy		13	4.81
7-Amyloidosis		9	3.33
8-Mesangio-proliferative GN		8	2.96
9-Haemolytic uraemic syndrome HUS		7	2.59
10-Immune complex crescentic GN		6	2.22
11-Post-infectious diffuse proliferative GN		3	1.11
12-Thin basement membrane disease		3	1.11
13-Alport's syndrome		3	1.11
Total		270	100.00
Chi-square	X^2	247.644	
	P-value	0.000	

All the included patients were divided into those with primary & those with secondary glomerulopathies according to the clinical & histopathological findings; It was found that 138 patients (33.74%) had primary glomerulopathies & 271 patients (66.26%) had secondary glomerulopathies, with highly significant difference (p-value=0.000) **(Figure 1)**.

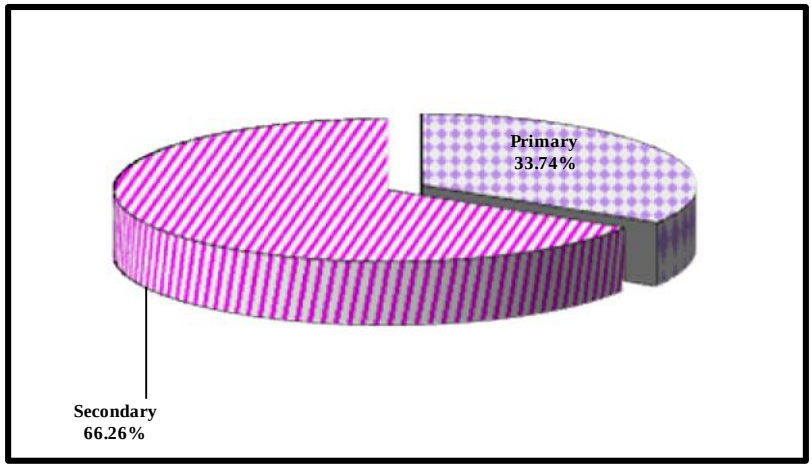

Figure (1): The percent of primary and secondary glomerulopathies

Among those patients with primary glomerulopathies, males (n=83/60.14%) were more common than females (n=55/39.86%), while in secondary glomerulopathies, females (n=165/60.89%) were more common than males (n=106/39.11%), with a highly significant difference (p-value=0.000) as shown in **(Figure 2)**.

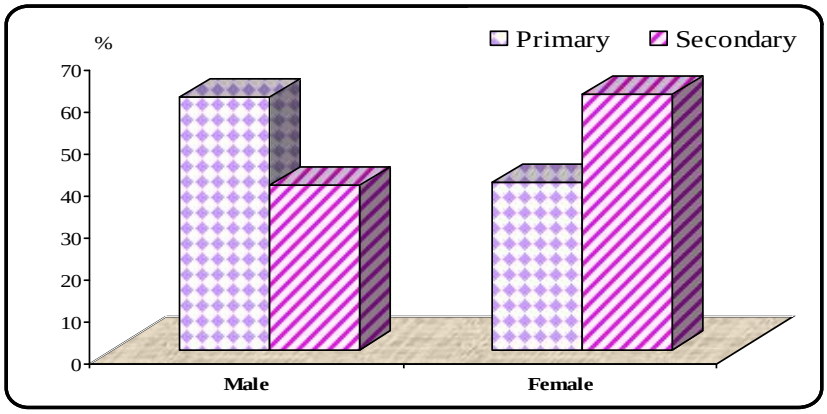

Figure (2): The percent of males and females in primary and secondary glomerulopathies

Regarding primary glomerulopathies (n=138/33.74%), Focal & segmental glomerulosclerosis was the most incident (39/138, 28.26%), followed by Membranoproliferative GN(30/138, 21.74%), Minimal change disease (19/138, 13.77%), Membranous GN(18/138, 13.04%), IgA nephropathy (13/138, 9.42%), Mesangio-proliferative GN (8/138, 5.80%), Immune complex crescentic GN (5/138, 3.62%) with equal percentage of Post-infectious GN and Thin basement membrane disease (3/138, 2.17%) within the studied six months **(Table 4)**.

FSGS included 39 patients (biopsy proven), with one of them associated with type I MPGN and another one diagnosed as collapsing glomerulopathy. MPGN included 30 patients (biopsy proven), with 18 patients of them diagnosed as type I MPGN and one patient diagnosed as type III MPGN (electron microscopic examination; EM) and the remainder diagnosed as MPGN based on light microscopic examination (LM) only. Membranous GN included 18 patients (biopsy proven), with 4 patients of them diagnosed as stage II membranous GN, 5 patients with stage III, ,one patient with stage II-III and one patient with stage IV membranous GN (electron microscopic examination) and the remainder diagnosed as membranous GN based on LM only. Also, one patient with membranous GN was associated with FSGS**.(figure 3, table 4)**

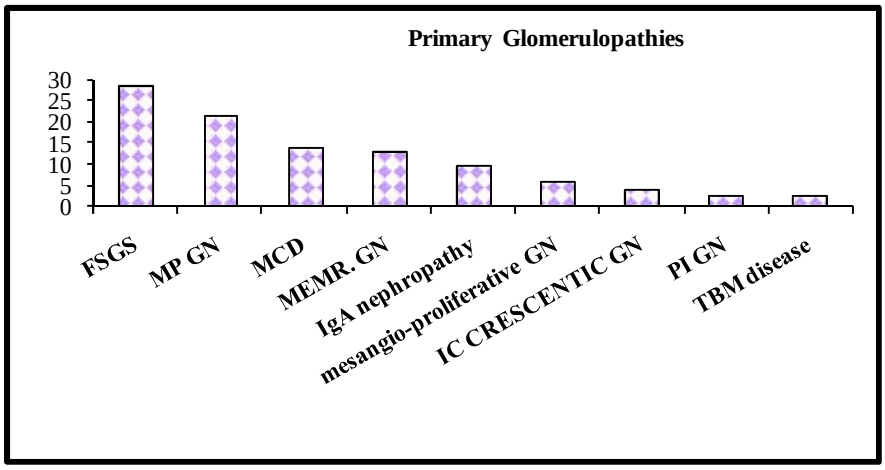

Figure (3): The types of primary glomerulopathies

Table (4): The etiology of different glomerulopathies within the 6 months based on renal biopsy findings and clinical diagnosis

Different Glomerulopathies		N	%
Primary Glomerulopathies:		138	33.74
1-Focal &segmental glomerulosclerosis		39	28.26
2-Membranoproliferative GN		30	21.74
3-Minimal change disease		19	13.77
4-Membranous GN		18	13.04
5-IgA nephropathy		13	9.42
6-Mesangio-proliferative GN		8	5.80
7-Immune complex crescentic GN		5	3.62
8-Post-infectious GN		3	2.17
9-Thin basement membrane disease		3	2.17
Secondary Glomerulopathies:		271	66.26
1-lupus nephropathy		103	36.40
2-Diabetic nephropathy		81	28.62
3-CLD (HCV,HBV,cryoglobulinaemia)		40	14.13
4-Haematological malignancies		9	3.18
5-Microangiopathy (TTP,HUS)		8	2.83
6-Secondary Amyloidosis		7	2.58
7-Overlap syndrome		6	2.12
8-Primary Amyloidosis		5	1.77
9-Wegner's granulomatosis		3	1.06
10-Alport's syndrome		3	1.06
11-Behcet's disease		2	0.71
12-Primary Antiphospholipid syndrome		2	0.71
13-Infective endocarditis		1	0.35
14-Still's disease		1	0.35
Total		409	100.00
Chi-square	X^2	695.010	
	P-value	0.000	

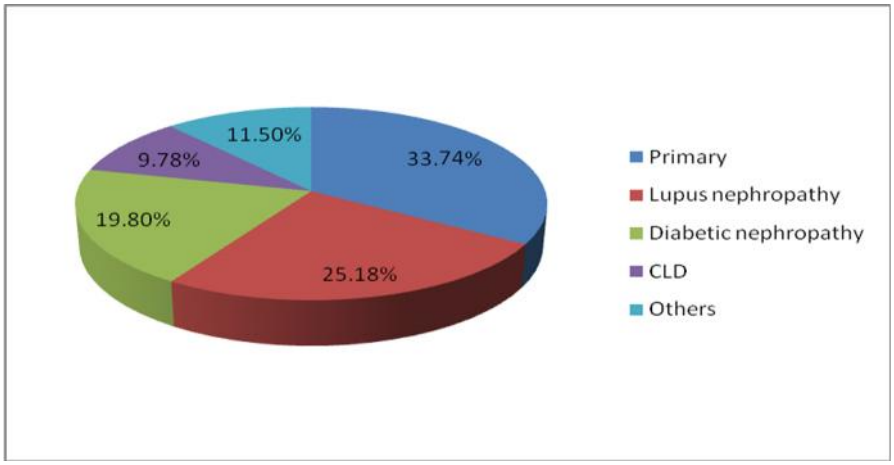

Figure (4): The percent of primary and different causes of secondary glomerulopathies

Regarding secondary glomerulopathies (n=271), lupus nephropathy (103/271, 36.40%) was the most common, followed by diabetic nephropathy (81/271, 28.62%), those associated with chronic liver disease (40/271,14.13%), haematological malignancies (9/271, 3.18%), microangiopathy (TTP,HUS) (8/271/ 2.83%), secondary amyloidosis (7/271, 2.58%), overlap syndrome (6/271, 2.12%), primary amyloidosis (5/271, 1.77%), wegner's granulomatosis (3/271, 1.06%), Alport's syndrome (3/271,1.06%), Behcet's disease (2/271, 0.71%), primary anti-phospholipid syndrome (2/271, 0.71%%) & one patient (0.35%) with each of the following diagnoses; infective endocarditis and still's disease **(Table 4, Figure 5 & 6)**.

Among patients with lupus nephritis, the most common encountered pathological class was class IV (n=42/15.56%) followed by class III (n=29/10.74%) then class II (n=24/8.89%), class V (n=4/1.48%), combined class V, III (n=2/0.74%), combined class V, IV (n=1/0.37%) and lastly class VI (n=1/0.37%)**.** As regards those patients with rheumatological diseases other than SLE (15 patients); 6 patients had overlap syndrome, 3 patients had wegner's granulomatosis, 3 patients had rheumatoid arthritis, 2 patients with Behcet's disease and one patient with still's disease. Wegner's Granulomatosis included 3 patients (2 patients diagnosed by nasal biopsy and one patient with renal biopsy showing immune complex crescentic GN).Patients with rheumatoid arthritis were diagnosed as having 2ry amyloidosis.

Among the 40 patients with glomerulopathy secondary to viral hepatitis, 39 patients had hepatitis C virus including four patients with HCV-associated cryoglobulinaemia & one patient had hepatitis B virus. All were diagnosed upon clinical suspicion except 6 patients who had biopsy proven MPGN and one patient with biopsy proven cryoglobulinaemic glomerulopathy.

Patients with haematological malignancies (n=9) included 4 patients with lymphoma, 5 patients with leukaemia, of which two patients had biopsy proven MPGN. Amyloidosis was diagnosed in 12 patients; 5 with biopsy proven primary amyloidosis & 7 patients with 2ry amyloidosis (one biopsy proven 2ry to malignancy, 3 biopsy proven 2ry to FMF and 3 2ry to rheumatoid arthritis).

Microangiopathies included 8 patients, one patient with TTP (diagnosed clinically), one patient with TTP/HUS (biopsy proven) and six patients with HUS (biopsy proven).

Alport's syndrome included three patients (biopsy proven with associated FSGS).

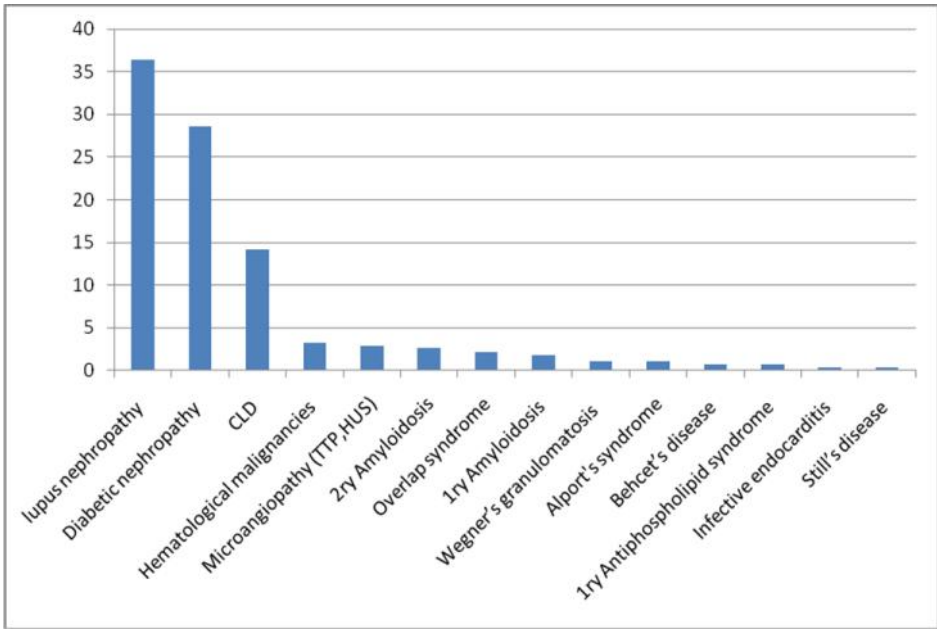

Figure (5): The causes of secondary glomerulopathies

As regard their clinical presentation, 126(30.81%) patients presented with nephrotic syndrome, followed by acute nephritic syndrome (91/22.25%), asymptomatic proteinuria (79/19.32%), systemic manifestations related to chronic kidney disease (59/14.43%), nephrotic nephritic syndrome (46/11.25%) and rapidly progressive GN (8/1.96%), with highly statistically significant difference where p-value=0.000 **(Figure 6)**.

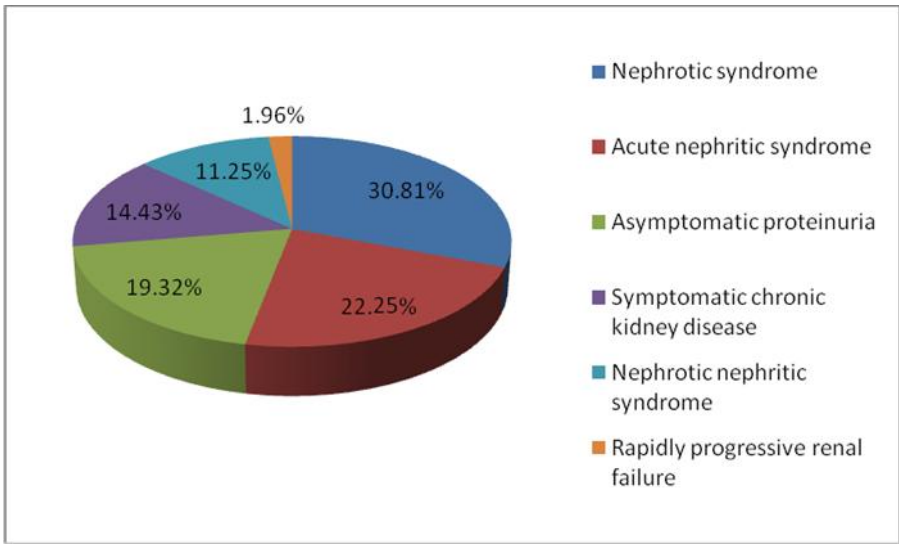

Figure (6): The percent of the presenting clinical syndrome

Discussion

This study revealed that in Ain Shams University hospitals, 409 patients were identified with newly diagnosed glomerular diseases, within 6 months of the study, of which 189 were males (46.21%) and 220 were females (53.79%), 138 patients (33.74%) representing primary glomerulopathies and 271 cases representing secondary glomerulopathies (66.26%).

In the study of the profile of glomerular diseases in a public hospital in Brazil, conducted by ***Fabio et al. (2010)*** over 4 years between August 2005 and May 2009, they recruited 113 patients, male patients prevailed (58/113; 51.3%) while females (55/113,48.7%), primary glomerulopathies (52/113; 46%) predominated, followed by secondary glomerulopathies (38/113; 33.6%) and others (20.4%) had non glomerular lesions as proven by renal biopsy as normal kidney, insufficient material, tubulointerstitial nephritis, and acute tubular necrosis. ***(2)***

In another study of the spectrum of nephropathies conducted by ***Deshpande et al. (2000),*** covering a period of 10 years, in India, 325 cases of nephropathies, 79.7 % were males and 20.3 % were females, it was observed that primary glomerular disease was the commonest entity and comprised of 61.5 % of all the nephropathies. ***(4)***

In another 5 year study of glomerulonephritis conducted by ***Malafronte et al. (2006),*** from May 1999 until January 2005, data were collected from, 1844 cases pointing to the diagnosis of glomerulopathies, primary glomerulopathies were the most frequent (54.2%), followed by secondary glomerulopathies (34.2%), tubulointerstitial nephropathies (acute tubular necrosis and acute tubulointerstitial nephritis) (2.3%), vascular nephropathies (cortical necrosis, benign nephroangiosclerosis and malignant nephroangiosclerosis) (4%) and miscellaneous/ unclassifiable (5.3%).***(5)***

The predominance of female sex may reflect the higher prevalence of SLE patients in our country. Also the predominance of secondary glomerulopathies may be due to the higher prevalence of SLE, Diabetic nephropathy and Glomerulonephritis secondary to HCV. ***(5)***

In Bahrain, ***Al Arrayed et al. (2004)*** conducted a retrospective study and analyzed 498 renal biopsies of Arab and non-Arab patients with proteinuria, haematuria, and mild to moderate renal impairment during a period of 13 years (between January 1990 and December 2002). Among the 498 samples, 375 (75.3%) belonged to Arab patients originating from Bahrain, United Arab Emirates, Oman, Yemen, Saudi Arabia, Kuwait, Qatar, North and East Africa, and the Mediterranean region. The male: female ratio was 1.4:1. Among the Arab cases, glomerular disease constituted 66.7% of their total. Primary glomerular diseases constituted 63.6% of glomerular lesions while secondary glomerular diseases, 36.4%.***(6)***

In the present study, the age group between 20-50 years old was the most common age group for patients presenting with newly diagnosed glomerular diseases representing 204/49.88%, followed by patients with more than 50 years old representing 122/29.83% and lastly patients with less than 20 years old constituting 83/20.29%, in concordance with other studies.

In the study of ***Fabio et al. (2010)(2)***, the age average was 34.9 ± 16.2 years-old, while in the study of ***Deshpande et al. (2000)(4)***, 92.6 percent were adults and 7.4 percent were children, while in the study of ***Malafronte et al. (2006)(5)***, the mean age of the patients was 34.5 ± 14.6 years.

In the current study, Focal & segmental glomerulosclerosis (FSGS) was the most common primary glomerulopathy (39/138, 28.26%), followed by Membranoproliferative GN (MPGN) (30/138, 21.74%), Minimal change disease (MCD)(19/138, 13.77%), Membranous GN (MGN)(18/138, 13.04%), IgA nephropathy (13/138, 9.42%), Mesangio-proliferative GN (8/138, 5.80%), Immune complex crescentic GN (5/138, 3.62%) ,Post-infectious GN (3/138, 2.17%) and Thin basement membrane disease (3/138, 2.17%).

In the study of spectrum of glomerulonephritis in Egypt conducted by ***Barsoum and Francis (2000)***, 1234 consecutive renal biopsies referred to the nephropathology team of Cairo University over two years were analyzed. Proliferative forms of glomerulonephritis [GN] (32.1%) and focal and segmental glomerulosclerosis [FSGS] (22.6%) were the most prevalent lesions. IgA glomerular deposits were detected in 9.8% of all GNs. The discrepancy between these two Egyptian studies may be due to the fact that ***Barsoum and Francis (2000)*** study included biopsy taken from children, where proliferative post-infectious glomerulonephritis is more common. ***(7)***

In other developing countries, in Brazil, in the study of ***Malafronte et al.(2006),*** the most common primary glomerular diseases were focal and segmental glomerulosclerosis (29.7%), followed by membranous nephropathy (20.7%), IgA nephropathy (17.8%), minimal change disease (9.1%), membranoproliferative glomerulonephritis (7%), crescentic glomerulonephritis (4.1%), advanced chronic glomerulopathy (4%), non-IgA mesangial glomerulonephritis (3.8%), diffuse proliferative glomerulonephritis (2.5%), focal segmental proliferative glomerulonephritis (1%) and others (0.3%), so Focal segmental glomerulosclerosis was the most frequent primary glomerular disease, followed by membranous nephropathy and IgA nephropathy. Also, this study revealed that primary glomerular diseases were more frequent in males (55.1%) than in females. ***(5)*** Also in Brazil, in the study of ***Fabio et al. (2010),*** focal segmental glomerulosclerosis (FSGS) predominated (14/52; 26.9%), followed by IgA nephropathy (13/52; 25%), minimal change disease (MCD) (11/52; 21.1%), membranous glomerulopathy (MGN) (7/ 52; 13.5%), and undetermined chronic glomerulonephritis (CGN) (7/52; 13.5%), so focal glomerulosclerosis (26.8%) followed by IgA nephropathy (25%) were predominant. ***(2)*** These two Brazilian studies are in agreement with each other in that focal segmental glomerulosclerosis was the most frequent primary glomerular disease and this in agreement with our study.

In India, the study of ***Deshpande et al. (2000),*** showed that acute diffuse proliferative glomerulonephritis was not only the commonest primary glomerulopathy (23.5) but the commonest nephropathy as well. The other primary glomerulopathies in descending order of frequency were, membranoproliferative glomerulonephritis (22.5%), mesangioproliferative glomerulonephritis (21.5%), chronic glomerulonephritis (9%), minimal change disease (7.5%), membranous glomerulopathy (7%), focal segmental glomerulosclerosis (5%) and crescentic glomerulonephritis (4%) and this study in contrast with our study. ***(4)***

While in developed countries, in the study conducted by ***Nair and Walker (2006),*** from 3/1/2001 to 2/28/2005 in a large renal biopsy referral center serving 24 states of the USA. IgAN was the most common primary glomerulopathy in young adult Caucasians (IgAN/FSGS 2.1:1). ***(8)*** Also in Europe, in the study of Primary glomerulopathies in Lithuania, conducted by ***Beitnaraitė et al. (2007),*** upon 1363 native kidney biopsies, during the period of 2000–2006, inflammatory glomerulopathies constituted 63.6% of all primary glomerulopathies (834 cases); IgA nephropathy was the most frequent disease (35.0%), membranoproliferative glomerulonephritis 16.7%, Extracapillary proliferative glomerulonephritis and diffuse endocapillary proliferative glomerulonephritis accounted for 9.1% and 4.4%, respectively, non-inflammatory glomerulopathies were relatively rare: focal and segmental glomerulosclerosis made up 14.8%; minimal change disease, 9.7%; membranous nephropathy, 7.4%. ***(9)*** These two studies from USA and Europe are in agreement with each other, where both of them showed that IgA nephropathy was the most common primary glomerulopathy and these studies are in contrast with our study.

In the Arab World, ***Mitwalli et al., 1996***, reviewed the clinical data and renal biopsies of 186 adult patients found to have nephropathy in Riyadh of Saudi Arabia, over a 5-year period (1989 to 1994). They found that mesangioproliferative glomerulonephritis was the most common lesion (21.1%), following followed by membranous glomerulonephritis (13.6%), immunoglobulin A nephropathy (IgAN) (13.6%), membranoproliferative glomerulonephritis (9.5%), and minimal change disease (1.4%). ***(10)*** In a retrospective histopathologic analysis of 490 native kidney biopsies performed on adult patients presenting to four hospitals in the Emirate of Abu Dhabi from 1978 to June 1996. Primary glomerular disease accounted for 77.1% of all biopsies. Chronic proliferative glomerulonephritis as a group was the predominant pathology (36.2%), followed by idiopathic membranous glomerulopathy (20.1%), focal segmental glomerulosclerosis (18.3%), minimal change nephropathy (18.3%), and IgA nephropathy (6.3%). ***(11)***. In Lebanon***, Mourani et al. (1998)*** found that mesangiocapillary glomerulonephritis and focal segmental glomerulosclerosis were the predominant histological findings. ***(12)*** In Bahrain, in the study of ***Al Arrayed et al. (2004),*** among the primary glomerular diseases, minimal change disease was the commonest lesion (27.7%) followed by focal segmental glomerulosclerosis (22.6%).The previous studies from the arab world showed that proliferative glomerulonephritis as a group was the predominant pathology***. (6)***

The Glomerulonephritis Registry of the Spanish Society of Nephrology (involving data from 7016 patients with biopsied renal diseases between 1994 and 1999) revealed that the most common glomerular diseases were IgA nephropathy, focal and segmental glomerulosclerosis and membranous nephropathy ***(13)***, the same profile of primary glomerular diseases was observed in the Czech Republic and Romania.***(14).*** In China and Italy, IgA nephropathy was the most common, followed by membranous nephropathy and focal and segmental glomerulosclerosis, respectively ***(15)***.

A possible explanation for the difference of the pattern of glomerulopathies between different studies was the periods of time evaluated, as more recently the frequency of focal and segmental glomerulosclerosis was seen to be increasing all over the world and also in developing countries.

In our study, as regards secondary glomerulopathies, lupus nephropathy (103/271, 36.40%) was the most common, followed by diabetic nephropathy (81/271, 28.62%), those associated with chronic liver disease (40/271,14.13%), haematological malignancies (9/271, 3.18%), microangiopathy (TTP,HUS) (8/271/ 2.83%), secondary amyloidosis (7/271, 2.58%),overlap syndrome (6/271, 2.12%), primary amyloidosis (5/271, 1.77%), Wegner's granulomatosis (3/271, 1.06%), Alport's syndrome(3/271,1.06%), Behcet's disease (2/271, 0.71%), primary anti-phospholipid syndrome (2/271, 0.71%%) & one patient (0.35%) with each of the following diagnoses; infective endocarditis and still's disease.

In developing countries, in Brazil, in the study of ***Malafronte et al. (2006,*** The most frequent secondary glomerular disease was lupus nephritis, corresponding to 66.2% of the cases, followed by post-infectious glomerulonephritis (12.5%), diabetic nephropathy (6.2%), diseases associated to paraproteinaemia (4.9%), hereditary diseases (4.6%), vasculitis (3.2%), malignancies (0.9.%), secondary focal segmental glomerulosclerosis (0.6%) and others (0.9%). Also in

concordance with our study, secondary glomerular diseases were more frequent in females (71.8%). They also found that of the primary and secondary glomerular diseases when considered altogether, the more frequent glomerulopathies were lupus nephritis followed by focal and segmental glomerulosclerosis. ***(5)*** Also in Brazil, ***Fabio et al. (2010)*** found that upon secondary glomerulopathies (n = 38), lupus nephritis predominated (19/38; 50%), followed by diffuse proliferative glomerulonephritis (13/38; 34.2%), pauci-immune glomerulonephritis (3/38; 8%), and hypertensive nephrosclerosis (3/38; 8%). (2) The previous two Brazilian studies are in agreement with each other in that, the most frequent secondary glomerular disease was lupus nephritis and this goes with our study. In contrast, the study of ***Deshpande et al. (2000)*** in India showed that amyloidosis was the commonest cause of secondary glomerulopathies and this in contrast with our study. (4)

In the Arab world, in the United Arab Emirates, ***Yahya et al. (1998)*** found, 33 (40.7%) of the patients with secondary kidney diseases had SLE, 27 (33.3%) amyloidosis, 14 interstitial nephropathy, and 7 diabetic nephropathy. ***(11)*** Also in Bahrain, ***Al Arrayed et al. (2004)*** revealed that Lupus nephritis (41.8%) formed the commonest cause of secondary glomerular diseases followed by diabetic nephropathy (33%) and hypertensive nephropathy (17.6%). ***(6)*** The previous two studies from the Arab World are in agreement with each other in that Lupus nephritis formed the commonest cause of secondary glomerular diseases and this matches ours.

As regard their clinical renal syndromes, our study revealed that 126(30.81%) patients presented with nephrotic syndrome, followed by acute nephritic syndrome (n=91/22.25%), asymptomatic proteinuria (n=79/19.32%), systemic manifestations related to chronic kidney disease (n=59/14.43%), nephrotic nephritic syndrome (n=46/11.25%) and rapidly progressive GN (n=8/1.96%).

In the developing countries, in Brazil, in the study of ***Malafronte et al. (2006)***, the most common glomerular syndrome was the nephrotic syndrome followed by asymptomatic haematuria and/or proteinuria, chronic renal failure, associated nephrotic/nephritic syndrome, rapidly progressive glomerulonephritis, nephritic syndrome, acute renal failure and macroscopic haematuria. ***(5)*** While in the study of ***Fabio et al. (2010),*** major glomerular syndromes were: nephrotic syndrome (41.6%) and the rapidly progressive glomerulonephritis (35.4%), followed by asymptomatic urinary abnormalities (14.2%); nephritic syndrome (5.3%); and undetermined kidney failure (3.5%).***(2)*** The previous two Brazilian studies are in agreement with each other in that nephrotic syndrome was the most common glomerular syndrome and this goes with our study. In Europe, The Glomerulonephritis Registry of the Spanish Society of Nephrology revealed nephrotic syndrome as the most common clinical syndrome at any age ***(13)*** and this in agreement with our study.

Conclusion

This study revealed that within 6 months only, 409 patients with newly diagnosed glomerular diseases were presented to Ain Shams University hospitals, the majority secondary to SLE followed by DM & viral hepatitis while FSGS was the most common primary glomerulopathy. Such epidemiological studies are of utmost importance to be carried out regionally & at different time periods to be aware of the changing patterns of glomerulopathies, to focus our researches on the early detection, prevention & management of the medical & financial burden we are facing yearly.

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