The Histopathological Profile Of Kidney Diseases In A Single Center In Egypt: An Overview Of 14 Years Of Experience

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ABSTRACT

Background: The histopathological examination of biopsied kidneys is a gold standard for renal diagnosis. Currently, there is a lack of long-term data collection and studies on renal diseases, whether on glomerular or other forms. Therefore, the present study was designed to determine the histopathological profile of nephropathy in a single large center in Egypt in the last 14 years and to discuss the differences from other countries.

Methods: The study was a retrospective descriptive study. The demographical and clinical data were analyzed for all patients who underwent renal biopsy in the renal unit of the Suez Canal University Hospital. The records of the renal biopsies which were performed for them at the hospital from January 1996 until the end of December 2009 were retrospectively analyzed.

Results: The mean age of the patients was 27.19 ± 14.31 years; 57.14 % were females and 42.86% were males. The most common indication of the kidney biopsy was nephrotic syndrome (43.1%), with the predominance of membranoproliferative glomerulonephritis (MPGN). The second indication was asymptomatic urinary abnormalities (AUA), (25.18%) and the third one was acute renal failure (15.98%). In all biopsies, MPGN was the most prevalent pathological diagnosis (38.74%), followed by membranous glomerulonephritis (22.76%). Lupus was the first co-morbid disease and the most frequent secondary glomerulonephritis.

Conclusion: Discussing the Egyptian registry for renal biopsy will help in increasing the understanding of the histopathology of renal diseases in Egypt in general and in the region of the Suez canal and Sinai in particular. Meticulous interest should be paid to AUAs, as about half of them had MPGN.

Key Words : Biopsy, Glomerulopathy, Kidney disease

INTRODUCTION

Renal biopsy remains the main diagnostic tool for renal diseases, which plays a major role in determining the management and the prognosis of parenchymal renal disease. It is the best way to monitor glomerular disease trends and to make policies for the early detection and the control of existing glomerular diseases. Therefore, histological examination of the biopsied kidneys has remained the gold standard for the diagnosis of renal diseases as yet [1][2][3].

Many studies and reports from different countries show that the incidence of renal diseases varies according to population, demographical characteristics, environmental factors, socio-economic status and the prevalence of infectious diseases [4] [5][6][7][8][9][10][11]. Currently, there is a lack of long-term data collection and studies on renal diseases, whether on glomerular or other forms. The present study was aimed at determining the histopathological profile of nephropathy in a single center in Egypt in the last 14 years and to discuss the differences from other countries. This is the first published study that reports the pattern of nephropathy in the Suez Canal area and Sinai. The current documented data may serve a resource for physicians and healthcare providers in their practice to improve the management of renal diseases.

PATIENTS AND METHODS

This study was a retrospective, descriptive study. The demographical and clinical data were analyzed for all patients who underwent renal biopsy in the renal unit of Suez Canal University Hospital. The records of renal biopsies which were performed for them at the hospital from January 1996 until the end of December 2009 were retrospectively examined. The hospital is a referral center for five governorates in Egypt (3 in the Suez Canal region and 2 in Sinai). It is a 600-bed, tertiary university, teaching hospital. The Suez Canal region and Sinai have a population of about 6 million people. The renal biopsy specimens were stained and analyzed by light microscopy. Both immunohistochemistry using polyclonal antisera against human IgG, IgM, IgA, C3, and electron microscopy were not systematically or routinely performed. All specimens were examined by at least two senior expert staff in both the renal and the pathology departments.

The indications for renal biopsy were categorized into nine clinical syndromes: nephrotic 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.

NS was defined as proteinuria >3.5g/day and hypoproteinemia. Acute nephritic syndrome was defined as haematuria, hypertension, oedema, oliguria and reduced glomerular filtration rate. AUA encompassed non-nephrotic proteinuria with or without microscopic haematuria. ARF was defined as a sudden and rapid deterioration of renal function, while CRF was considered when elevated serum creatinine persisted for >6 months [2],[4],[11].

The histopathological diagnoses were classified into four major

categories: Glomerulonephritis (primary/secondary), interstitial nephritis (acute/chronic), deposit nephropathy (amyloidosis/ malignant infiltration) and miscellaneous. Miscellaneous pathologies included end-stage renal disease (ESRD), acute tubular necrosis (ATN), acute cortical necrosis, renal infarction, and diabetic nephropathy.

GN had been classified into ten pathologies: Minimal change GN, focal segmental glomerulosclerosis (FSGS), membranoproliferative glomerulonephritis (MPGN), membranous glomerulonephritis (MGN), poststreptococcal glomerulonephritis (PSGN), rapidly progressive glomerulonephritis (RPGN), diffuse proliferative GN, focal proliferative GN, mesangioproliferative GN, and acute exudative GN.

Data analysis: The data were coded and organized. The final study results were stated by using the SPSS program, version 14. The results were presented through tables. The Chi-square test was used for the qualitative variables, while the independent t-test was used for the quantitative variables. Statistical significance was considered at P-values <0.05 and a higher significance at P-values <0.001.

Ethical consideration: The study protocol was approved by the hospital ethics committee. The data were collected after taking the permission from the hospital authorities. The names of the patients were omitted (anonymous). All data were used for scientific purposes only.

RESULTS

During the period of 14 years, and after exclusion of the cases with inadequate data collection or insufficient sample material, 413 biopsies from native kidneys were analyzed. The mean age of the patients was 27.19+14.31 years; 57.14 % were females and 42.86% were males. 47.44 % had no co-morbid conditions. The most frequent co-morbidity was systemic lupus (SLE), representing nearly one quarter (24.21%) of the patients, followed by hypertension (14.8%) , chronic liver disease (4.1%) and diabetes (2.4%). A majority of the biopsies were done with a closed, percutaneous ultrasound guided technique, which represented 96.86 % of the biopsies, while 3.14 % were open biopsies. The mean number of glomeruli was 13.78.

Items Mean ±SD		Range
S.Creatinine(mg/dl)	0.37-26	3.30 ±4.47
Total Protein(g/dl)	3.90-7.90	5.39 ±1.33
Albumin(g/dl)	0.60-4.50	2.24±0.92
Sodium	126-157	138.96±6.85
Potassium	0.90-7.30	4.68±1.08
Total Calcium	4.70-12.3	8.15±1.24
Phosphorus	2.37-10.60	5.78±7.98
Protein in 24 hours urine collection	0.13-9.90	2.80±2.55

[Table /Fig 1]: Laboratory profile of patients at biopsy time

[Table/Fig 1]: presents the laboratory profile of the patients at the time of biopsy. The mean value of serum creatinine was 3.3+4.47 mg%.

[Table/Fig 2] shows that the most common indication of the kidney biopsies was nephrotic syndrome which comprised nearly half of the indications of the biopsies (43.1 %), followed by asymptomatic urinary abnormality and acute renal failure (25.18 % and 15.98 % respectively). The rarest indication was malignant infiltration, which formed 0.73 % of all the biopsies.

Indication	Frequency (413) %	
Nephritic Syndrome	178	3.30 ±4.47
Nephritic Syndrome	15	5.39 ±1.33
Mixed Nephritic/ Nephritic Syndrome	12	2.24±0.92
Acute renal failure	66	138.96±6.85
Chronic renal failure(ARF)	29	4.68±1.08
Asymptomatic urinary abnormalities	104	8.15±1.24
Accidentally discovered (IKF)	6	5.78±7.98
Malignant infiltration	3	0.73
Total	413	100

[Table /Fig 2]: Distribution of patients according to the indication of kidney biopsy

[Table/Fig 3] shows that MPGN was the most prevalent pathological diagnosis, representing more than one third of the cases (38.74 %), followed by MGN (22.76 %).

Category	Diagnosis	Frequency (N = 413)	%
Glomerulonephritis	Minimal change GN	35	8.48
	FSGS	15	3.63
	MPGN	160	38.74
	MGN	94	22.76
	PSGN	7	1.70
	Diffuse proliferative GN	9	2.18
	Focal proliferative GN	10	2.42
	Mesangioproliferative GN	11	2.66
	RPGN	12	2.91
	Acute exudative GN	2	0.48
Tubulointerstitial nephropathy acute interstitial nephritis	1	0.24	
	chronic interstitial nephritis	12	2.91
Deposit nephropathy	Amyloidosis	13	3.15
	Malignant infiltration	3	0.73
Miscellaneous	ATN	13	3.15
	Acute cortical necrosis	5	1.21
	Renal infarction	2	0.48
	Diabetic nephropathy	2	0.48
	ESRD	7	1.70
Total		100	413

[Table /Fig 3]: Prevalence of the different biopsy proven renal diseases over the period 1996-2009

GN = glomerulonephritis, TIN = Tubulointerstitial nephropathy, FSGS=focal segmental glomerulosclerosis,

Diagnoses	1996	1997	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008	2008	2009	Total
Minimal change GN	-	3	1	2	6	4	3	1	-	1	5	5	2	2	35
FSGS	1	3	4	1	3	-	-	-	1	-	-	-	1	1	15
MPGN	15	10	5	6	5	13	15	15	8	17	7	18	12	14	160
MGN	7	9	9	7	5	9	18	2	2	4	3	3	9	7	94
PSGN	-	-	-	2	3	-	1	-	-	-	-	1	-	-	7
Diffuse proliferative GN	-	2	1	-	-	-	1	-	-	-	1	-	2	2	9
Focal proliferative GN	2	-	-	3	-	-	-	-	-	-	-	-	3	2	10
Mesangioproliferative GN	2	3	2	-	2	-	-	-	-	-	-	-	-	2	11
RPGN	-	1	2	2	-	2	2	-	-	-	1	1	1	-	12
ESRD	-	1	-	3	-	-	1	-	1	-	1	-	-	-	7
ATN	-	-	2	3	1	2	1	1	-	1	-	-	1	1	13
Acute cortical necrosis	-	1	-	1	-	1	-	-	-	-	-	-	2	-	5
Acute interstitial nephritis	-	-	1	-	-	-	-	-	-	-	-	-		-	1
Chronic interstitial nephritis	2	0	1	-	-	-	1	-	-	-	1	3	1	3	12
Actue exudative GN	-	2	0	-	-	-	-	-	-	-	-	-	-	-	2
Amyloidosis	-	2	2	-	-	-	3	0	0	2	0	1	1	2	13
Renal infarction	1	0	0	1	-	-	-	-	-	-	-	-	-	-	2
Diabetic nephropathy	-	1	-	-	-	1	-	-	-	-	-	-	-	-	1
Malignat infiltration	1	-	-	-	-	-	-	-	-	1	-	-	1	-	3
Total	31	38	30	31	25	32	46	19	12	26	19	32	36	36	413

[Table /Fig 4]: Frequency of different pathologic diagnosis per year

MPGN= membranoproliferative glomerulonephritis , MGN = membranous glomerulonephritis , PSGN = poststreptococcal glomerulonephritis, RPGN= Rapidly progressive glomerulonephritis , ESRD= end stage renal disease , ATN = acute tubular necrosis.

GN= glomerulonephritis, FSGS= focal segmental glomerulsclerosis , MPGN = membranoproliferative glomerulonephritis , MGN = membranous glomerulonephritis , PSGN = postsetrptococcal glomerulonephritis, RPGN= Rapidly progressive glomerulonephritis , ESRD= end stage renal disease , ATN = acute tubular necrosis.

[Table/Fig 4]: shows the frequency of different biopsy proven renal diseases per year. MPGN and MGN were still the most prevalent diseases per year. The fluctuations from year to year were non-significant.

[Table/Fig 5] presents the distribution of the different histopathological patterns according to the indications of the biopsies. Nephrotic syndrome and asymptomatic urinary abnormality were the main indications for MPGN and MGN. PSGN was represented nearly equally by either pure nephritic or mixed nephrotic / nephritic presentations. ARF was the only presentation for ATN, acute cortical necrosis, acute interstitial nephritis and renal infarction.

MPGN = membranoproliferative glomerulonephritis , MGN = membranous glomerulonephritis , PSGN = postsetrptococcal glomerulonephritis , RPGN = Rapidly progressive glomerulonephritis , ESRD= end stage renal disease , ATN = acute tubular necrosis

DISCUSSION

In the current study, the registry of the renal unit and the medical files of the patients which were recovered from the central registry unit of the Suez Canal University Hospital were used to review all the clinical, laboratory and renal histopathological data.

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 paediatric patients. This was the same as reported from Czech [4] , Serbia [5], Italy[6] , France [7] and Romania[8], but this was not the case in Korea[9] and Japan[10], where the paediatric contributions were 40.5 % and 20 % respectively, out of all the renal biopsies.

The observed female gender predominance over the male gender in the current study may be due to the high incidence and prevalence of SLE with lupus nephritis, which is much higher in females than in males. Nearly one quarter of our patients (24.21%) had SLE. Such a female predominance is coincident with reports from previous studies which were done in Egypt[11] , but in opposition to most reports from the European countries, which show on one hand, a balanced gender distribution as seen in Serbia [5] and in Romania[8] and on other hand, a male gender predominance as seen in Italy[6] and Czech[4].
The mean number of glomeruli which were seen in our study was 13.78 ± 1.23, which is much higher than that reported from other centers. In Romania, the mean number was 9.1 ± 4.9 [8].

This reflects more accurate biopsies with regards to the technical and histopathological diagnosis.

By analyzing the current data, 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 %). These results agree with those from previous studies done by Barsoum and Francis in Cairo, Egypt [11]. Nephrotic syndrome represented 31.9 % of the cases in their study. In Arabian countries, the predominance of the nephrotic syndrome was clear. In Jordan, it represented 51.6 % of the cases [12] and in the United Arab Emirates, it represented 54 % of the cases [13]. Outside the Arab world, the presence of nephrotic syndrome as the main indication of the biopsy, was comprehensible, as shown by reports from Serbia (36.92 %)[5] , Romania (52.3 %) [8], Senegal (67 %)[14] and Brazil (42 %)[15]. Regarding the renal biopsy pattern, MPGN was found to be the most histopathological feature of nephrotic syndrome in our data (43.26), followed by MGN (33.71). Nevertheless, there was a marked difference in the diagnosis of these cases from the histopathological diagnosis of the cases with nephrotic syndrome in other studies. IGA nephropathy was the main cause of nephrotic syndrome in most European reports, with the exception of Italy [6] and Macedonia [16], where MGN represented 32.9 % and 13.5 % of the cases respectively, while FSGN was the main feature in reports from Africa [14].

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. This reflects the policy of the nephrology unit of the Suez Canal University Hospital to detect the renal disease early in its course. In other parts of the world, the same picture was noted. It represented 36.2% in Czech[4] and 30.8% in Italy[6]. Much higher percentage was observed in reports from Japan (48.1 %)[10]. As a picture of dissimilarity, AUA accounted for only 3.3 % of the cases in Romania [8].

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. The striking feature was MPGN, followed by MGN, which can be attributed to the actuality that patients with MPGN and MGN constitute 61.5% of all the studied biopsies. It is also striking that acute cortical necrosis and acute interstitial nephritis account for 7.58% and 1.52 % of the cases. This may be explained by the policy of using kidney biopsy as a diagnostic tool in patients with acute renal failure, when the course is atypical or the insult is unknown, while patients with conventional insults (e.g. : pregnancy complication, systemic inflammatory response syndrome, drugs,…etc) are not routinely biopsied. Reports from Romania showed a figure which was close to that found in the present study [8].

The nephritic syndrome and the mixed nephrotic/nephritic presentation represented 3.63 % and 2.91 % of the cases respectively, in the present study. This is relevant to the old Italian survey which showed that nephritic syndrome accounted for 4.02 % of the cases and the pathological diagnosis was mainly PSGN and IGA nephropathy with minor cases of necrotizing vasculitis and crescentic GN [6]. These data were in harmony with our results, which showed that PSGN accounted for 26.66% and 25% of both the presentations. This was found to cope up with the natural history of the disease. Such a prevalence of nephritic syndrome is much less than in the Romanian reports, which showed that nephritic syndrome accounts for 21.9 % of the cases [8]. That could be attributed to the low socioeconomic status and the subsequent high prevalence of the infectious processes.

In general, the present study emphasizes a strong geographical variation of the renal histopathological pattern. It showed that MPGN represented 38.74 % of all the cases, followed by MGN (22.76 %). In Arabian countries like Bahrain, SGN constituted the highest frequencies [17]. In Jordan, FSGN was the main diagnosis, accounting for 27.3 % of the cases, followed by MPGN, which accounted for 21.2 % of the cases [12], which agreed with reports from Saudi Arabia [18] and Sudan [19]. This is in contrast to most European studies, which showed that the most common pathological diagnosis was IGA nephropathy, which mainly involved the western and central European countries with a variable percentage. For example : 37 % in Italy[6] , 34 % in Czech[4] , 17% in Spain[20] and 15% in Lithuania [21], while the eastern countries showed variable diagnoses, as the most common one in Romania was MPGN (29 %)[8] and that in Serbia was MGN (21.6%)[5]. These variations can be attributed to ethnic and social discrepancies. In Africa, as in Senegal, due to the predominance of the black race more than other ethnic populations, FSGN was the main diagnosis. It accounted for 67% of the primary glomerulonephritis cases [14]. In Australia [22] and USA [23], the most common diagnosis was IGA nephropathy, which accounted for 34% and 21% of the reported cases. This figure is relevant to the European series and can be attributed to the fact that the US and the Australian population had an original European ethnicity. In Asia, studies done in China [24],[25] and Korea [9] revealed that IGA nephropathy was the most common pathological abnormality, accounting for nearly 50.7 % and 28 % of the cases respectively.

Furthermore, there are regional variations inside the same country as in Egypt. MPGN was the most frequent diagnosis in the Suez canal area and in Sinai, in contrast to other studies, which revealed that FSGN was the most frequent diagnosis in the Cairo area [11]. Many reports from other countries supported this hypothesis of regional variation. In Brazil, FSGN was found to be very common in the central region (26.9 %), while MGN was common in the north (29.6 %) and IGA nephropathy was common in the south (22.8 %)[15].

A striking feature in the age distribution of the glomerular diseases was observed in our study. This was relevant to a study which was done in Pakistan [26], but was different from one which was done in UK, which showed that minimal change GN was the third in rank, accounting for only 9.8 % of all the adult primary glomerular diseases, while IGA nephropathy and MGN accounted for 38.8 % and 29.4 % of all the adult primary glomerular diseases respectively [27]. Such a high prevalence of IGA nephropathy was due to the fact that IGA nephropathy was the most prevalent glomerular disease in UK in all age groups.

GA nephropathy was reported to be the commonest type of glomerulonephritis in several parts of the world, but it did not appear to be so in our study. This may be attributed to the fact that immunofluorescence studies were not routinely done in our pathology units. In addition, this was attributed by the clinical

Category	Indication	Nephrotic syndrome		Nephrotic syndrome		Mixed		ARF		CRF		AUA		Accidentally discovered IKF		Graft rejection		Malignant infiltration	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Glomerulo-nephritis	Minimal change GN (n=35)	23	12.9	2	13.33	-	-	-	-	-	-	10	9.6	-	-	-	-	-	-
	FSGS (n=15)	8	4.5	-	-	2	16.7	-	-	-	-	5	4.8	-	-	-	-	-	-
	MPGN (n=160)	77	43.3	3	20	5	41.7	13	19.7	7	25	51	49.1	4	66.7	-	-	-	-
	MGN (n=94)	60	33.7	3	20	2	16.7	10	15.1	3	10.7	16	15.4	-	-	-	-	-	-
	PSGN (n=7)	-	-	4	26.66	3	25	-	-	-	-	-	-	-	-	-	-	-	-
	Diffuse proliferative GN (n=9)	-	-	1	6.67	-	-	3	4.6	-	-	5	4.8	-	-	-	-	-	-
	Focal proliferative GN (n=10)	-	-	1	6.67	-	-	2	3.1	2	7.1	5	4.8	-	-	-	-	-	-
	Mesangioprolif-erative GN (n=11)	3	1.7	-	-	-	-	-	-	-	-	8	7.7	-	-	-	-	-	-
	RPGN (n=12)	1	0.6	1	6.67	-	-	10	15.1	-	-	-	-	-	-	-	-	-	-
	Acute exudative GN (n=2)	1	0.6	-	-	-	-	-	-	-	-	1	0.9	-	-	-	-	-	-
TIN	Acute interstitial nephritis (n=1)	-	-	-	-	-	-	1	1.5	-	-	-	-	-	-	-	-	-	-
	Chronic interstitial nephritis (12)	-	-	-	-	-	-	1	1.5	8	28.6	2	1.9	1	16.7	-	-	-	-
Deposit-nephropathy	Amyloidosis (n=13)	3	1.7	-	-	-	-	6	9.1	2	7.1	-	-	1	16.7	1	100		
	Malignant infiltration (n=3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	100
Miscellaneous	ATN (n=13)	-	-	-	-	-	-	13	19.7	-	-	-	-	-	-	-	-	-	-
	Acute cortical necrosis (n=5)	-	-	-	-	-	-	5	7.6	-	-	-	-	-	-	-	-	-	-
	Renal infarction (n=2)	-	-	-	-	-	-	2	3.1	-	-	-	-	-	-	-	-	-	-
	Diabetic nephropathy (n=2)	1	0.6	-	-	-	-	-	-	-	-	1	0.9	-	-	-	-	-	-
	ESRD (n=413)	1	0.6	-	-	-	-	-	-	6	21.4	-	-	-	-	-	-	-	-
Total (n=413)	178	100	15	100	12	100	66	100	28	100	104	100	6	100	1	100	3	100	

[Table /Fig 5]: Distribution different histopathological pattern according to the indication for kidney biopsy.

policy of not subjecting the patients to an expensive or invasive procedure without significant reflection on their diagnosis and treatment.

Chronic interstitial nephritis was noted in 2.91 % of the cases. It was the most common cause of CRF and 91.67% of them were adults. This was germane to a study done in Serbia, which emphasized that the disease starts at a younger age and progresses to a full blown picture of CRF in adults. Nevertheless, it should be taken into consideration, that cases of Balkan endemic nephropathy were reported, as was chronic interstitial nephritis [5]. From earlier studies from Cairo, Egypt, it was reported that the prevalence of chronic interstitial nephritis was much higher, which comprised of 11 % of the cases, which reflected an increased medical awareness in the patients due to their urban background [11]. Regarding amyloidosis, it was found to account for 3.15 % of our cases. All of them were adults. This is very close to the figure reported from Spain, which showed that amyloidosis occurred in 3.3 % of the biopsied patients, but this was less than the figure reported from Lithuania, where amyloidosis was reported in 8.6 % of all the renal biopsies [21]. The rarest features in our data were acute exudative glomerulonephritis and diabetic nephropathy. This can be explained by our policy that patients with long standing diabetes, showing nephrotic manifestation, were not routinely biopsied, especially if they had the manifestation of microangiopathy as retinopathy.

Nearly one quarter of our patients had SLE as a co-morbid condition. It is the most common cause for secondary glomerulonephritis. Similar results were reported by Rahbar from the west of Iran [2]. Despite hypertension as the second most frequent co-morbid condition, we reported no cases of hypertensive nephrosclerosis. This was supported by a group of studies done in several countries like Brazil [15] , Saudi Arabia [18], Sudan[19] and Serbia[5].

CONCLUSION

The most common indication of the kidney biopsies was nephrotic syndrome, followed by AUA and acute renal failure. The rarest indication was malignant infiltration. MPGN was the most prevalent pathological diagnosis, representing more than one third of the cases, followed by MGN. A majority of the patients were females and the most common clinical presentation among them was nephrotic syndrome. SLE was the most common secondary cause of MPGN and MGN. Nevertheless, particular interest should be paid to AUAs, as about half of them had MPGN.

Limitation of the study: The main drawback and limitation of the study was that, an immunofluorescence setup or an electron microscope were not available to study a majority of the patients.

RECOMMENDATION

Developing a well-structured national Egyptian registry for renal biopsies through the collection of data from various regional

nephrology units for two purposes. First, to draw the map of the renal diseases which are prevalent in Egypt. Second, to catalogue the histopathological findings made by common diagnostic codes like those suggested by the European Dialysis and Transplantation Association. To avoid misdiagnosis and failure and to make some important diagnoses, immunofluorescence should be available.

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