

GLOMERULONEPHRITIS IN KELANTAN, MALAYSIA : A REVIEW OF THE HISTOLOGICAL PATTERN

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Abstract. Renal biopsy is essential in the management of renal parenchymal diseases. Thus far there is no published report on the pattern of glomerulonephritis in Kelantan.

We decided to establish the pattern of glomerulonephritis in Kelantan and use this information as our reference in future studies. Records of patients who had proven glomerulonephritis histologically were analysed. Their biological data, clinical presentation, etiology and clinicopathological pattern were studied. Where appropriate mean and standard deviation were calculated.

A total of 74 biopsies were performed during the study period (between January 1991 and December 1993), out of which 72 biopsies (97.3%) were considered suitable for analysis. The male to female ratio was 1:1.1. Mean age at presentation was 27.6 ± 12.2 years. Nephrotic syndrome was the commonest clinical presentation (65.3%). The main underlying cause was systemic lupus erythematosus (50%) followed by primary glomerulonephritis. Histologically, IgA nephropathy and minimal change disease were the main patterns among patients with primary glomerulonephritis while diffuse proliferative glomerulonephritis was the commonest pattern among patients with lupus nephritis.

Hence the pattern of glomerulonephritis is similar to other reported series. The procedure is considered safe and has a high success rate.

INTRODUCTION

Renal biopsy is an essential diagnostic tool in the management of patients with renal parenchymal diseases. It provides a definitive histopathology diagnosis hence helped in planning a rationale therapeutic approaches (Cheong *et al*, 1981).

The pattern of glomerular diseases reported earlier by Kuala Lumpur General Hospital (Cheong *et al*, 1981) which served almost equal proportion of Malay and Chinese patients may not exactly reflect the pattern of glomerular diseases in Kelantan (a state located in the North-Eastern part of West Malaysia) which is predominantly inhabited by Malays.

Futhermore this far there is no such report from this region as the renal biopsy services were not available until 1991. Most patients who were referred to the Institute Urology and Nephrology

in Kuala Lumpur for renal biopsy refused to go, citing financial and social reasons.

The introduction of renal biopsy services in our hospital enables us to establish the pattern of this disease and to guide us in the management of our patients in future.

MATERIALS AND METHODS

This is a retrospective study. All records of patients in whom renal biopsies were performed between January 1991 to December 1993 were reviewed. Their biological data, clinical presentations, pathological changes and the underlying causes were analysed.

Renal biopsies were done percutaneously under local anesthesia using trucut biopsy needles (Baxter). The biopsy materials were processed and routinely examined under light microscopy and immunofluorescence microscopy.

For light microscopy, thin sections 1-3 μ m thick were routinely stained with haematoxylin

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and eosin (H and E), Periodic-acid Schiff (PAS), Masson's Trichrome (MT), silver-methanamine and Martiusscarlet blue (MSB). Only specimens with 4 or more glomeruli are included in this review.

RESULTS

There were a total of 74 renal biopsies performed during the study period, *ie* 24.6 patients on average were biopsied per year. This accounted for about 12.3 per 10,000 admissions.

Suitable specimens were obtained in 72 biopsies (97.3%). There was no mortality. Three patients had macroscopic hematuria after biopsy and two of them required blood transfusion. Pain at biopsy site was very common and easily relieved with paracetamol. None of the patients had vasovagal attack due to prolonged abdominal compression.

Records of patients with suitable biopsy specimens were further analysed. A total of 72 patients were included in the study, out of which 38 were female and 34 were male. Their mean age at presentation was 27.6 ± 12.2 years. The majority of them were Malays (87.5%) and the remainder (12.5%) were Chinese and Thai.

Their clinical presentation at the time of renal biopsy are shown in Table 1. Fifty percent of the glomerulonephritis cases were due to systemic lupus erythematosus while primary glomerulonephritis accounted for 43.0% of cases (Table 2).

The mean age of patients with systemic lupus nephritis was 27.8 ± 11.4 years. The histological findings and clinico-pathological correlation of primary glomerulonephritis are presented in

Table 2

The causes of glomerulonephritis in HUSM.

Causes	n = 72	%
Systemic lupus erythematosus	36	50.0
Primary (Idiopathic)	31	43.0
Hepatitis B induced	4	5.6
Henoch Schönlein purpura	1	1.4

Tables 3 and 4 respectively, while the clinico-pathological correlations of patients with lupus nephritis are shown in Table 5.

It has been found that IgA nephritis and minimal change disease were the leading histological patterns seen in primary glomerulonephritis while diffuse proliferative glomerulonephritis was the commonest histological pattern seen in lupus nephritis.

DISCUSSION

Since its introduction in the 1940s renal biopsy has become a useful diagnostic test to aid the clinician in the diagnosis and management of renal diseases (Spargo *et al.*, 1980). We have established a renal biopsy service over the past three years and decided an interim review of our cases would help to determine the type of renal diseases which we are dealing with in this region.

The number of renal biopsies performed by us, 24.6 patients per year was far lower than were reportedly done in other centers locally (Cheong

Table 1

Clinical presentation prior to renal biopsy.

Presentation	n = 72	%
Nephrotic syndrome	47	65.3
Nephritic syndrome	8	11.1
Proteinuria	9	12.5
Haematuria	2	2.8
Renal failure	6	8.3

Table 3

Histological pattern in primary glomerulonephritis.

Histological lesions	n = 31	%
Minimal Change	9	29.0
Focal segmental sclerosis	6	19.4
Membranous	2	6.5
Membranoproliferative	1	3.2
IgA nephritis	13	41.9

Table 4
Clinico-pathological correlation in primary glomerulonephritis.

Clinical features	MCD	FSGS	Memb	Memprol	IgA	Total
Nephrotic syndrome	8	5	2	1	4	20
Nephritic syndrome	-	-	-	-	2	2
Proteinuria	1	1	-	-	2	4
Haematuria	-	-	-	-	1	1
Renal failure	-	-	-	-	4	4

MCD = minimal change disease
 FSGS = focal segmental glomerulosclerosis
 Memb = membranous glomerulonephritis
 Memprol = membrano-proliferative glomerulonephritis
 IgA = IgA nephropathy

Table 5
Clinico-pathological correlation in lupus nephritis.

Clinical features	WHO Classification						Total
	I	II	III	IV	V	VI	
Nephrotic syndrome	2	3	3	12	2	-	23
Nephritic syndrome	-	1	1	4	-	-	6
Proteinuria	-	1	2	1	-	-	4
Haematuria	-	1	-	-	-	-	1
Renal failure	-	-	-	1	-	1	2
Total	2	6	6	18	2	1	36

WHO Classification
 I = minimal change glomerulonephritis (GN)
 II = mesangial proliferative GN
 III = Focal proliferative GN
 IV = Diffuse proliferative GN
 V = Membranous GN
 VI = Advanced sclerosing GN

et al, 1981; Woo *et al*, 1986). This is because the number of patients seen in our hospital was far lower than in other centers as we served a smaller area compared to the densely populated states on the West Coast of West Malaysia. Furthermore, patients treated in other hospitals in this region who refused renal biopsy were not referred to the Hospital University Science Malaysia (HUSM).

Suitable specimens were obtained in 97.3% of the biopsies which was higher than that reported in

the Kuala Lumpur center 81.6% (Cheong *et al*, 1981). A direct localisation of kidneys with ultrasound examination prior to renal biopsy contributes to better tissue yield. In addition renal biopsy was considered safe as there were no mortality from the procedure and only three patients had macroscopic hematuria postoperatively which settled spontaneously.

Primary glomerulonephritis and lupus nephritis were the main underlying causes in our patients. The

mean age at presentation of patients with primary glomerulonephritis was 27.4 ± 13.3 years and there was no preponderance of either sex, the ratio of males to females being 1.1:1. The mean age at presentation of patients with lupus nephritis was 27.8 ± 11.4 years; there was a higher preponderance of lupus nephritis among females (Parichatikanond *et al*, 1986; Kong *et al*, 1988). From our study, lupus nephritis affects females more frequently than males but with a ratio of female to male being 3:1, which is different from other studies reported elsewhere which quote a ratio of female: male = 10:1 to 19:1 (Parichatikanond *et al*, 1986; Kong *et al*, 1988).

There was an interesting female : male ratio in patients with lupus nephritis described by Kong *et al* (1988) in relation to their age. In the first decade of life, the female : male ratio was unity. In the fifth decade, this ratio declined from 8:2 in the peak age groups to 3:1 and thereafter to unity again. This reflected the well established fact of the influence of female sex hormones on SLE (Dobis, 1974).

Frank (1980) drew attention to the higher incidence of systemic lupus erythematosus among the Chinese in Malaysia and two other studies indicated a high prevalence of the disease among Chinese in Hawaii (Serdula and Rhoads, 1979) and

higher mortality among Chinese with systemic lupus erythematosus in the United States generally (Kaslow, 1982). However, SLE is not uncommon amongst the Malays in Kelantan. In fact a recently reported study in Kuala Lumpur (Kong *et al*, 1988) revealed that Malays, Indians and Chinese are affected in similar proportions.

The majority of our patients subjected to renal biopsy had the nephrotic syndrome which was comparable with other local experience (Cheong *et al*, 1981). Only 8 patients (11.1%) who were subjected to renal biopsy had the nephritic syndrome. This does not reflect the true incidence of nephritic syndrome in Kelantan as those with was presumed to be post-streptococcal in origin were not routinely biopsied. Only those with atypical clinical courses and those with doubtful cause were biopsied.

In Singapore (Woo *et al*, 1986), asymptomatic urinary sediment was the commonest mode of presentation of patients (41%) who were subjected to renal biopsy. Patients with asymptomatic urinary sediments accounted for 15.3% or our cases which was still lower compared to other study reported locality which quote a figure of 26.4% (Cheong *et al*, 1981).

In our clinical experience we noted that majority of our patients with asymptomatic urinary

Table 6
Relative frequency of primary glomerulonephritis.

Authors	MCD	FSG	MEMB	Memprol	FP	DP	IgA
Cameron (1972)	29.0%	6.4%	7.8%	13.3%	2.1%	11.6%	-
Ng (1979)	20.9%	14.9%	11.2%	9.3%	13.5%	18.1%	-
Sinniah and Koo (1979)	28.2%	-	3.2%	2.0%	9.8%	7.6%	38.9%
Cheong (1981)	21.4%	7.1%	7.1%	4.2%	24.5%	20.4%	-
Zainal (1994)*	29.0%	19.4%	6.5%	3.2%	-	-	41.9%

MCD	=	minimal change glomerulonephritis (GN)
FSG	=	focal segmental glomerulosclerosis
MEMB	=	membranous GN
Memprol	=	membrano-proliferative GN
FP	=	Focal proliferative GN
DP	=	Diffuse proliferative GN
IgA	=	IgA nephropathy

*Present series

abnormalities detected from routine medical examination refused to be subjected to renal biopsy. The reasons given by them were not totally clear.

In the primary glomerulonephritis group IgA nephropathy was the commonest histological pattern followed by minimal change disease. This is comparable with other experience elsewhere: the lower incidence of membranous and membranoproliferative disease is comparable to findings from Singapore by Sinniah and Khoo (1979). This may suggest a characteristic related to regional factors. Focal segmental glomerulosclerosis accounted for 19.4% of cases, which is relatively higher than other reported studies (Table 6).

From our study it appears that if a patient who presents with nephrotic syndrome and a secondary cause has been excluded, minimal change disease will be the most likely histological change, followed by focal segmental glomerulosclerosis and IgA nephropathy. In a patient with systemic lupus erythematosus who presents with nephrotic syndrome, a diffuse proliferative type of glomerulonephritis will be expected.

In summary, the pattern of glomerulonephritis in Kelantan is similar to earlier reports in other centers in Malaysia. However the relatively higher incidence of male lupus nephritis amongst the Malays was unexpected.

The procedure is considered safe and had a high success rate despite having been carried out irregularly throughout the year. In future we hope the number of renal biopsies performed in our hospital will increase. Hence there is a need to conduct public education to instruct Kelantanese with regard to the safety and importance of renal biopsy.

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