

CHAPTER 1

Overview Of Renal Biopsy In Malaysia

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1.1 Introduction

The first Malaysian Registry of Renal Biopsy (MRRB) report was published in 2009. The report provided data of renal biopsy performed and reported for year 2005 to 2007 from most of the centres providing nephrology services in the Ministry of Health Malaysia (MOH). Since 2008, the MRRB had invited participation from non MOH nephrologists and renal physicians. Thus the second MRRB report will include data from MOH centres, universities and private hospitals. Renal biopsies performed in MOH centres from 2005-2007 which were previously reported will also be updated and reported in this second MRRB report.

1.2: Renal biopsies from the participating centres

1.2.1 Ascertainment rate of total biopsy performed

From 2005 to 2008, a total of 22 centres (15 adult and 7 paediatric) from the Ministry of Health (MOH) submitted data to the MRRB. Eleven additional non MOH centres from the army, universities and private hospitals also contributed data since 2008. These participating centres will be identified by their centre identification number.

In 2005, a total 784 renal biopsies were performed and of these, 723 were reported. In 2006, 1028 renal biopsies were performed and 936 were reported. In 2007, 1037 renal biopsies were performed and of these 963 were reported. In 2008, 1519 renal biopsies were performed and of these 1155 were reported. This gives an ascertainment rate of 92.2% for 2005, 91.1% for 2006, 92.9% for 2007 and 76.0% for 2008. The average ascertainment rate for 2005-2008 was 86.5% (Table 1.2.1).

Table 1.2.1: Total number of reported and unreported renal biopsies by centres, 2005 – 2008

Centre	2005		2006		2007		2008		Total	
	Done and reported	Done but not reported	Done and reported	Done but not reported	Done and reported	Done but not reported	Done and reported	Done but not reported	Done and reported	Done but not reported
	n	n	n	n	n	n	n	n	n	n
1	97	0	107	0	101	0	120	3	425	3
2	2	0	10	1	24	0	84	1	120	2
3	97	3	104	0	65	0	55	0	321	3
4	13	0	18	0	19	0	18	0	68	0
5	28	0	38	0	44	6	3	0	113	6
6	0	30	0	0	0	0	0	0	0	30
7	31	4	45	3	55	1	50	0	181	8
8	27	0	28	0	24	0	24	0	103	0
9	10	3	5	0	11	0	11	0	37	3
10	21	0	27	0	21	0	22	0	91	0
11	68	0	81	0	61	0	94	0	304	0
12	0	0	0	0	0	0	0	0	0	0
13	0	11	42	21	4	28	31	0	77	60
14	0	0	2	0	7	1	0	7	9	8
15	18	3	6	27	0	25	0	27	24	82
16	15	0	24	0	31	1	26	11	96	12
17	39	0	50	0	44	0	0	0	133	0
18	74	0	101	10	63	0	87	0	325	10

Table 1.2.1: Total number of reported and unreported renal biopsies by centres, 2005 – 2008 (cont.)

Centre	2005		2006		2007		2008		Total	
	Done and reported	Done but not reported	Done and reported	Done but not reported	Done and reported	Done but not reported	Done and reported	Done but not reported	Done and reported	Done but not reported
	n	n	n	n	n	n	n	n	n	n
19	42	0	51	0	42	0	55	0	190	0
20	92	7	140	0	109	12	110	16	451	35
21	16	0	24	1	14	0	16	0	70	1
22	28	0	24	0	37	0	41	0	130	0
23	0	0	0	0	0	0	0	179	0	179
24	0	0	0	0	176	0	151	28	327	28
25	0	0	0	0	0	0	0	25	0	25
26	0	0	0	0	0	0	0	0	0	0
27	4	0	2	0	4	0	2	0	12	0
28	0	0	0	0	1	0	12	0	13	0
29	0	0	0	0	0	0	0	12	0	12
30	0	0	7	0	1	0	4	0	12	0
31	1	0	0	0	0	0	4	20	5	20
32	0	0	0	0	0	0	0	10	0	10
33	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	2	0	40	25	42	25
35	0	0	0	0	0	0	2	0	2	0
36	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	3	0	3	0
38	0	0	0	0	0	0	17	0	17	0
39	0	0	0	0	0	0	19	0	19	0
40	0	0	0	0	3	0	17	0	20	0
41	0	0	0	29	0	0	37	0	37	29
42	0	0	0	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0
Total	723	61	936	92	963	74	1155	364	3777	591

1.2.2 Type of renal biopsy performed

As expected, majority of the biopsies reported were from native kidneys: 90.2% in 2005, 87.4% in 2006, 87.1% in 2007 and 89.4% in 2008. The rest were from graft kidneys (Table 1.2.2).

Table 1.2.2: Distribution of reported native and graft renal biopsies by centres, 2005-2008

Centre	2005		2006		2007		2008		Total			
	Native n	Graft n	Native n	Graft n	Native n	Graft n	Native n	Graft n	Native n	%	Graft n	%
1	69	28	57	50	58	43	83	37	267	8	158	36
2	2	0	10	0	24	0	81	3	117	4	3	1
3	85	12	93	11	63	2	51	4	292	9	29	7
4	13	0	17	1	19	0	18	0	67	2	1	0
5	27	1	36	2	42	2	3	0	108	3	5	1
6	0	0	0	0	0	0	0	0	0	0	0	0
7	26	5	34	11	43	12	40	10	143	4	38	9
8	27	0	27	1	23	1	23	1	100	3	3	1
9	10	0	5	0	11	0	11	0	37	1	0	0
10	21	0	25	2	20	1	21	1	87	3	4	1
11	68	0	79	2	61	0	93	1	301	9	3	1
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	42	0	4	0	31	0	77	2	0	0
14	0	0	2	0	7	0	0	0	9	0	0	0
15	18	0	6	0	0	0	0	0	24	1	0	0
16	15	0	24	0	31	0	26	0	96	3	0	0
17	35	4	47	3	44	0	0	0	126	4	7	2
18	72	2	99	2	61	2	82	5	314	9	11	3
19	41	1	38	13	33	9	38	17	150	4	40	9
20	74	18	121	19	87	22	96	14	378	11	73	17
21	16	0	23	1	14	0	16	0	69	2	1	0
22	28	0	24	0	37	0	39	2	128	4	2	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	146	30	124	27	270	8	57	13
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	4	0	2	0	4	0	2	0	12	0	0	0
28	0	0	0	0	1	0	12	0	13	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	7	0	1	0	4	0	12	0	0	0
31	1	0	0	0	0	0	4	0	5	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	2	0	40	0	42	1	0	0
35	0	0	0	0	0	0	2	0	2	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	3	0	3	0	0	0
38	0	0	0	0	0	0	16	1	16	0	1	0
39	0	0	0	0	0	0	19	0	19	1	0	0
40	0	0	0	0	3	0	17	0	20	1	0	0
41	0	0	0	0	0	0	37	0	37	1	0	0
42	0	0	0	0	0	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0	0	0
Total	652	71	818	118	839	124	1032	123	3341	100	436	100

1.2.3: Number of renal biopsy done on each individual patient

The data captured in MRRB is year based. New biopsies and patients biopsied before 2005 were included. The number of biopsy episode/attempt per patient is recorded accordingly.

In the native biopsy group, from 2005 to 2008, 3193 patients had renal biopsy done. 2776 patients had renal biopsy for the first time, 355 patients had biopsy done twice, 54 patients had biopsy done thrice and 8 patients had four or more biopsy done on them. Therefore about 13.1% of patients had a repeat native biopsy done (Table 1.2.3(a)).

In the allograft biopsy group; over the same period, 312 patients underwent a graft biopsy. 193 patients had biopsy done once, 84 patients had biopsy done twice, 21 patients had biopsy done thrice and 14 patients had biopsy done four times or more (Table 1.2.3 (b)). As expected, there was a higher rate of repeat graft biopsies (38.1%).

Table 1.2.3(a): Distribution of native renal biopsy in patients by number of episodes

Native	2005		2006		2007		2008		Total
	n	%	n	%	n	%	n	%	n
1 st episode	519	85	673	87	692	87	892	88	2776
2 nd episode	78	13	93	12	77	10	107	11	355
3 rd episode	10	2	5	1	24	3	15	1	54
>4 th episode	1	0	1	0	3	0	3	0	8
Total patient	608	100	772	100	796	100	1017	100	3193

Table 1.2.3 (b): Distribution of renal allograft biopsy in patients by number of episodes

Graft	2005		2006		2007		2008		Total
	n	%	n	%	n	%	n	%	n
1 st episode	31	72	57	70	51	60	54	53	193
2 nd episode	10	23	18	22	23	27	33	32	84
3 rd episode	2	5	5	6	6	7	8	8	21
>4 th episode	0	0	2	2	5	6	7	7	14
Total patient	43	100	82	100	85	100	102	100	312

1.2.4: Demographic distribution of renal biopsy (Native and Graft)**1.2.4.1: Age distribution**

Eighty three percent of native biopsies were done in patients older than 15 years old and in this group, 91.8% of the biopsies were done in patients less than 55 years age. Very few (7%) biopsies were done in patients older than 55 years old (Table 1.2.4.1 (a)).

In the graft biopsy group, 95% were done in patients older than 15 years old and of these, 89.2% were in the age group of 15 to less than 55 years. Only 10% of the graft biopsies were done in those above 55 years of age (Table 1.2.4.1(b)).

For adults (age ≥ 15 years old) the highest number of renal biopsy was reported in Wilayah Persekutuan (WP) Kuala Lumpur (25%), followed by Selangor (22%) and Sabah (13%). In the paediatric group (age < 15 years old), the highest number of renal biopsy were reported in WP Kuala Lumpur (28%), followed by Johor (23%) and Selangor (15%) (Table 1.2.4.1(c)).

Table 1.2.4.1(a): Age distribution of native renal biopsy, 2005-2008

Age group	2005	2006	2007	2008	Total	
	n	n	n	n	n	%
<15	128	135	146	164	573	17
15-<25	173	239	217	303	932	28
25-<35	145	183	191	223	742	22
35-<45	117	125	131	134	507	15
45-<55	59	80	90	130	359	11
55-<65	18	43	43	50	154	5
≥ 65	12	13	21	28	74	2
Total	652	818	839	1032	3341	100

Table 1.2.4.1(b): Age distribution of renal allograft biopsy, 2005-2008

Age group (years)	2005	2006	2007	2008	Total	
	n	n	n	n	n	%
<15	0	5	7	9	21	5
15-<25	15	26	19	22	82	19
25-<35	11	25	15	20	71	16
35-<45	23	26	49	25	123	28
45-<55	12	24	24	34	94	22
55-<65	8	8	10	9	35	8
≥ 65	2	4	0	4	10	2
Total	71	118	124	123	436	100

1.2.4.2: Gender distribution

As in the first MRRB report, in the native renal biopsy group, there were more females compared to males (ratio 3:2). This was probably due to the higher number of females among the patients biopsied for SLE (Table 1.2.4.2(a)). However, in the graft biopsy group, there were more males (ratio 2:1)(Table 1.2.4.2 (b)). This is consistent with the trend of male predominance amongst the transplant patients as reported in the 16th Report of The Malaysian Dialysis and Transplant Registry.

Table 1.2.4.2(a): Gender distribution of native renal biopsy, 2005-2008

Gender	2005	2006	2007	2008	Total	
	n	n	n	n	n	%
Male	229	330	314	422	1295	41
Female	379	442	482	595	1898	59
Total	608	772	796	1017	3193	100

Table 1.2.4.2(b): Gender distribution of renal allograft biopsy, 2005-2008

Gender	2005	2006	2007	2008	Total	
	n	n	n	n	n	%
Male	26	54	53	62	195	63
Female	17	28	32	40	117	38
Total	43	82	85	102	312	100

1.2.4.3: Racial distribution

Among the patients who had native kidney biopsy, majority were Malays (56%), followed by Chinese (26%)(Table 1.2.4.3(a)). In the allograft biopsy group, majority of patients were Chinese (54%) followed by Malay (32%) (Table 1.2.4.3 (b)).

Table 1.2.4.3(a): Racial distribution of native renal biopsy, 2005-2008

Race	2005	2006	2007	2008	Total	
	n	n	n	n	n	%
Malay	341	436	429	569	1775	56
Chinese	149	185	226	269	829	26
Indian	40	59	58	70	227	7
Others	78	92	83	109	362	11
Total	608	772	796	1017	3193	100

Table 1.2.4.3(b): Racial distribution of renal allograft biopsy, 2005-2008

Race	2005	2006	2007	2008	Total	
	n	n	n	n	n	%
Malay	12	23	27	38	100	32
Chinese	27	49	47	46	169	54
Indian	2	7	8	11	28	9
Others	2	3	3	7	15	5
Total	43	82	85	102	312	100

1.2.5: Renal biopsy report analysis

A total of 3777 renal biopsies were performed and reported from 2005 to 2008. There were 869 (23%) of the biopsies yielded less than 10 glomeruli, which our pathologists felt was the minimum number of glomeruli required to label a biopsy as adequate. 38(1%) biopsies were classified as missing because the histopathology reports were not submitted to MRRB. The remaining 76.0% reported 10 or more glomeruli.

Table 1.2.5: Number of glomeruli obtained at each biopsy by centres, 2005-2008

Total number of glomeruli Centre	Less 10		10 & above		Missing		Total	
	n	%	n	%	n	%	n	%
1	75	9	349	12	1	3	425	11
2	15	2	105	4	0	0	120	3
3	48	6	273	10	0	0	321	8
4	7	1	61	2	0	0	68	2
5	22	3	91	3	0	0	113	3
6	0	0	0	0	0	0	0	0
7	42	5	138	5	1	3	181	5
8	17	2	86	3	0	0	103	3
9	12	1	25	1	0	0	37	1
10	38	4	53	2	0	0	91	2
11	126	14	178	6	0	0	304	8
12	0	0	0	0	0	0	0	0
13	10	1	41	1	26	68	77	2
14	2	0	7	0	0	0	9	0
15	8	1	13	0	3	8	24	1
16	37	4	59	2	0	0	96	3
17	98	11	359	13	1	3	458	12
18	0	0	0	0	0	0	0	0
19	23	3	166	6	1	3	190	5
20	79	9	368	13	4	11	451	12
21	14	2	56	2	0	0	70	2
22	60	7	70	2	0	0	130	3
23	0	0	0	0	0	0	0	0
24	108	12	219	8	0	0	327	9
25	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	4	0	8	0	0	0	12	0
28	5	1	8	0	0	0	13	0
29	0	0	0	0	0	0	0	0
30	0	0	12	0	0	0	12	0
31	1	0	4	0	0	0	5	0
32	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0
34	6	1	35	1	1	3	42	1
35	0	0	2	0	0	0	2	0
36	0	0	0	0	0	0	0	0
37	1	0	2	0	0	0	3	0
38	1	0	16	1	0	0	17	0
39	4	0	15	1	0	0	19	1
40	2	0	18	1	0	0	20	1
41	4	0	33	1	0	0	37	1
42	0	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0	0
Total	869	100	2870	100	38	100	3777	100

1.2.6: Histopathology specimen distribution to histopathology laboratories

As shown in Table 1.2.6, not all biopsies performed at the centres were read by the local histo-pathologists. A number of the renal biopsy specimens were sent to other centres for processing and reporting. A total of 47.6% of HPE slides were read locally and 52.4% were sent to another laboratory (Table 1.2.6 (a)).

The histopathology laboratories were coded by a number (Table 1.2.6 (b)).

Table 1.2.6(a): Distribution of biopsy specimens to histopathology laboratories by participating centres, 2005-2008

Centre	Local histopathology laboratories						Outside histopathology laboratories						All									
	2005	2006	2007	2008	Total	%	2005	2006	2007	2008	Total	%	2005	2006	2007	2008	Total	%				
1	58	14	58	14	98	23	116	27	330	78	39	9	49	12	3	1	4	1	95	22	425	100
2	90	28	98	31	31	10	15	5	234	73	7	2	10	8	24	20	84	70	120	100	120	100
3	13	19	17	25	11	16	1	1	42	62	0	0	1	1	8	12	17	25	26	38	68	100
4	26	23	37	33	44	39	3	3	110	97	2	2	1	1	0	0	0	0	3	3	113	100
7	9	9	7	7	8	8	6	6	30	29	18	17	21	20	16	16	18	17	73	71	103	100
8	8	22	5	14	8	22	11	30	32	86	2	5	0	0	3	8	0	0	5	14	37	100
10	21	23	26	29	21	23	22	24	90	99	0	0	1	1	0	0	0	0	1	1	91	100
11	68	22	81	27	60	20	94	31	303	100	0	0	0	0	1	0	0	0	1	0	304	100
13	0	0	11	14	0	0	0	0	11	14	0	0	31	40	4	5	31	40	66	86	77	100
14	0	0	0	0	0	0	0	0	0	0	0	0	2	22	7	78	0	0	9	100	9	100
15	18	75	6	25	0	0	0	0	24	100	15	16	24	25	21	22	4	4	64	67	96	100
16	0	0	0	0	10	10	22	23	32	33	113	25	151	33	107	23	87	19	458	100	458	100
17	36	19	37	19	41	22	52	27	166	87	6	3	14	7	1	1	3	2	24	13	190	100
19	9	2	15	3	1	0	2	0	27	6	83	18	125	28	108	24	108	24	424	94	451	100
20	2	3	0	0	0	0	0	0	2	3	14	20	24	34	14	20	16	23	68	97	70	100
21	28	22	24	18	37	28	41	32	130	100	28	22	24	18	37	28	41	32	130	100	130	100
22	28	22	24	18	37	28	41	32	130	100	28	22	24	18	37	28	41	32	130	100	130	100

Table 1.2.6(a): Distribution of biopsy specimens to histopathology laboratories by participating centres, 2005-2008 (cont.)

Centre	Local histopathology laboratories						Outside histopathology laboratories						All										
	2005		2006		2007		2008		Total		2005		2006		2007		2008		Total		All		
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
24	0	0	0	0	174	53	150	46	324	99	0	0	0	0	2	1	1	0	3	1	327	100	
25																							
26																							
27											4	33	2	17	4	33	2	17	12	100	12	100	
28											0	0	0	0	1	8	12	92	13	100	13	100	
29																							
30											0	0	7	58	1	8	4	33	12	100	12	100	
31											1	20	0	0	0	0	4	80	5	100	5	100	
32																							
33																							
34	0	0	0	0	2	5	40	95	42	100											42	100	
35											0	0	0	0	0	0	2	100	2	100	2	100	
36																							
37											0	0	0	0	0	0	3	100	3	100	3	100	
38											0	0	0	0	0	0	17	100	17	100	17	100	
39											0	0	0	0	0	0	19	100	19	100	19	100	
40											0	0	0	0	3	15	17	85	20	100	20	100	
41											0	0	0	0	0	0	37	100	37	100	37	100	
42																							
43																							
Total	358	100	398	100	509	100	534	100	1799	100	365	100	538	100	454	100	621	100	1978	100	3777	100	

Table 1.2.6(b): Histopathology laboratories receiving renal biopsy specimens, 2005-2008

HistoLab	2005		2006		2007		2008		Total	
	n	%	n	%	n	%	n	%	n	%
1	0	0	7	1	2	0	6	1	15	0
2	30	4	39	4	48	5	5	0	122	3
3	0	0	0	0	0	0	23	2	23	1
4	0	0	0	0	10	1	22	2	32	1
5	210	29	363	39	429	45	532	46	1534	41
6	19	3	6	1	6	1	1	0	32	1
7	24	3	26	3	38	4	24	2	112	3
8	105	15	125	13	42	4	16	1	288	8
9	11	2	15	2	1	0	2	0	29	1
10	17	2	13	1	16	2	17	1	63	2
11	96	13	105	11	98	10	152	13	451	12
12	0	0	11	1	0	0	0	0	11	0
13	1	0	0	0	0	0	1	0	2	0
14	38	5	71	8	1	0	0	0	110	3
15	15	2	24	3	19	2	2	0	60	2
16	0	0	0	0	2	0	42	4	44	1
17	157	22	131	14	251	26	294	25	833	22
18	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	11	1	11	0
20	0	0	0	0	0	0	1	0	1	0
Total	723	100	936	100	963	100	1155	100	3777	100

1.3: Native kidney biopsy

1.3.1: Clinical Indications of renal biopsy

The main indications for native kidney biopsies were nephrotic syndrome (46%) followed by urinary abnormalities (28%) (Table 1.3.1 (a)). A total of 1818 (54%) patients had normal renal function at time of biopsy, 32% had impaired renal function and for the rest, renal function was either not available or unknown at time of biopsy (Table 1.3.1 (b)).

Table 1.3.1(a): Indications for native renal biopsies, 2005-2008

Clinical presentations	2005		2006		2007		2008		Total	
	n	%	n	%	n	%	n	%	n	%
Asymptomatic urine abnormality	168	26	218	27	231	28	304	29	921	28
Nephritic syndrome	61	9	66	8	62	7	90	9	279	8
Nephrotic syndrome	311	48	372	45	389	46	466	45	1538	46
Nephrotic-nephritic syndrome	21	3	38	5	52	6	99	10	210	6
Unknown	91	14	124	15	105	13	73	7	393	12
Total	652	100	818	100	839	100	1032	100	3341	100

Table 1.3.1(b): Renal function at time of biopsy

Renal function	2005		2006		2007		2008		Total	
	n	%	n	%	n	%	n	%	n	%
Normal	364	56	415	51	464	55	575	56	1818	54
Impaired	150	23	238	29	291	35	381	37	1060	32
Missing / unknown	138	21	165	20	84	10	76	7	463	14
Total	652	100	818	100	839	100	1032	100	3341	100

1.3.2: Histopathological diagnosis

In the native kidney biopsy group, the three most common primary glomerulonephritis (GN) reported were focal segmental glomerulosclerosis (FSGS) (33%), minimal change disease (33%) and IgA nephropathy (17%). Membranous nephropathy only comprises 9% of the total primary GN subgroup (Table 1.3.2).

Lupus nephritis was the commonest secondary GN; accounting for 84% of cases (Table 1.3.2).

Table 1.3.2: Histopathology of all native renal biopsies, 2005-2008

Type	2005			2006			2007			2008			Total		
	n	%	n	n	%	n	n	%	n	%	n	%	n	%	
Primary GN	Minimal Change Disease	94	32	107	28	128	36	174	36	503	33				
	FSGS	103	35	145	38	114	32	135	28	497	33				
	Ig A nephropathy	37	13	62	16	58	16	99	21	256	17				
	Membranous nephropathy	23	8	33	9	35	10	39	8	130	9				
	Membrano-proliferative	12	4	10	3	4	1	6	1	32	2				
	Mesangial Proliferative: non-IgA	16	5	10	3	12	3	11	2	49	3				
	Crescentic ANCA	1	0	1	0	0	0	4	1	6	0				
	Idiopathic Crescentic	6	2	9	2	3	1	4	1	22	1				
	Unknown	0	0	0	0	2	1	6	1	8	1				
	Subtotal	292	100	377	100	356	100	478	100	1503	100				
	Other Infection	0	0	1	0	1	0	5	1	7	0				
	Lupus Nephritis	270	89	309	85	310	82	341	81	1230	84				
	Henoch Schonlein purpura	3	1	2	1	2	1	14	3	21	1				
	HUS / TTP	2	1	1	0	0	0	0	0	3	0				
Amyloidosis	1	0	4	1	1	0	2	0	8	1					
Systemic vasculitis	1	0	4	1	2	1	1	0	8	1					
Post infection GN	17	6	12	3	16	4	15	4	60	4					
Polyarteritis Nodosa	0	0	0	0	0	0	0	0	0	0					
Malignancy	0	0	1	0	1	0	1	0	3	0					
Light/Heavy chain disease	0	0	0	0	1	0	1	0	2	0					
Diabetic nephropathy	8	3	27	7	40	11	37	9	112	8					
Anti GBM	0	0	0	0	0	0	0	0	0	0					
Immunotactoid /fibrillary GN	0	0	0	0	0	0	0	0	0	0					
Multiple myeloma	0	0	1	0	2	1	1	0	4	0					
Unknown	0	0	0	0	3	1	3	1	6	0					
Subtotal	302	100	362	100	379	100	421	100	1464	100					
Secondary GN															

Table 1.3.2: Histopathology of all native renal biopsies, 2005-2008 (cont.)

Type	Histopathological diagnosis	2005		2006		2007		2008		Total	
		n	%	n	%	n	%	n	%	n	%
Tubulointerstitial I disease	Acute interstitial nephritis	5	24	7	14	10	19	22	24	44	21
	Acute tubular-necrosis	10	48	33	67	33	61	31	34	107	50
	Chronic interstitial	6	29	9	18	11	20	37	41	63	29
	Subtotal	21	100	49	100	54	100	90	100	214	100
Vascular	Atherosclerosis	0	0	0	0	2	18	0	0	2	5
	Benign/malignant hypertension	2	100	7	100	9	82	18	95	36	92
	Missing	0	0	0	0	0	0	1	5	1	3
	Subtotal	2	100	7	100	11	100	19	100	39	100
Hereditary	Alport's syndrome	0	0	2	50	1	50	0	0	3	33
	Thin Basement membrane disease	1	50	1	25	0	0	1	100	3	33
	Others	1	50	1	25	1	50	0	0	3	33
Subtotal	2	100	4	100	2	100	1	100	9	100	
Advance GN		16	100	20	100	23	100	21	100	80	100
Others		0	0	2	100	16	100	22	100	40	100

1.3.3: Histopathology findings in common clinical presentation**1.3.3.1: Histopathological diagnosis in patients with nephrotic syndrome**

In patients presenting with nephrotic syndrome, the commonest histopathology reported was minimal change (27%), followed by lupus nephritis(24%) and focal segmental glomerulosclerosis (23%) (Table 1.3.3.1).

Table 1.3.3.1: HPE diagnosis in patients presenting with nephrotic syndrome, 2005-2008

Type	Histopathological diagnosis	n	%
Primary	Minimal Change Disease	417	27
	FSGS	356	23
	Ig A nephropathy	64	4
	Membranous nephropathy	89	6
	Membrano-proliferative	18	1
	Mesangial Proliferative GN-non IgA	24	2
	Crescentic	0	0
	Idiopathic crescentic	3	0
	Unknown	5	0
	Sub total	976	62
Secondary	Other infection	3	0
	Lupus Nephritis	374	24
	Henoch Schonlein Purpura	3	0
	HUS/TTP	1	0
	Amyloidosis	5	0
	Systemic vasculitis	1	0
	Post infection GN	8	1
	Polyarteritis nodosa	0	0
	Malignancy	0	0
	Light/ heavy chain disease	1	0
	Diabetic nephropathy	52	3
	Anti GBM	0	0
	Immunotactoid / fibrillary GN	0	0
	Multiple myeloma	1	0
	Unknown	3	0
	Sub total	452	29
Others		140	9
Total		1568	100

*Patients may have either one or more histopathology or not have any histopathology

1.3.3.2: Histopathological diagnosis in patients with urinary abnormalities

In patients presenting with urinary abnormalities, IgA (15%) was the commonest histopathology reported in the primary GN group; while the most common secondary GN was lupus nephritis (50%) (Table 1.3.3.2).

Table 1.3.3.2: HPE diagnosis in patients presenting with asymptomatic urine abnormalities, 2005-2008

Type	Histopathological diagnosis	n	%
Primary	Minimal Change Disease	49	5
	FSGS	77	9
	Ig A nephropathy	136	15
	Membranous nephropathy	29	3
	Membrano-proliferative	4	0
	Mesangial Proliferative GN-non IgA	17	2
	Crescentic	3	0
	Idiopathic crescentic	3	0
	Unknown	1	0
	Sub total	319	35
Secondary	Other infection	2	0
	Lupus Nephritis	450	50
	Henoch Schonlein Purpura	11	1
	HUS/TTP	0	0
	Amyloidosis	2	0
	Systemic vasculitis	1	0
	Post infection GN	10	1
	Polyarteritis nodosa	0	0
	Malignancy	0	0
	Light/ heavy chain disease	0	0
	Diabetic nephropathy	21	2
	Anti GBM	0	0
	Immunotactoid / fibrillary GN	0	0
	Multiple myeloma	1	0
	Unknown	2	0
	Sub total	500	55
	Others		84
Total		903	100

* Patients may have either one or more histopathology or not have any histopathology

1.3.3.3: Histopathological diagnosis in patients with nephritic-nephrotic syndrome

In patients presenting with Nephritic-nephrotic syndrome the common histopathology among the primary GN were IgA (7%) and FSGS (7%) and among the secondary GN was lupus nephritis (49%) (Table 1.3.3.3).

Table 1.3.3.3: HPE diagnosis in patients presenting with nephritic-nephritic, 2005-2008

Type	Histopathological Diagnosis	n	%
Primary	Minimal Change Disease	14	6
	FSGS	17	7
	Ig A nephropathy	15	7
	Membranous nephropathy	5	2
	Membrano-proliferative	4	2
	Mesangial Proliferative GN-non IgA	3	1
	Crescentic	0	0
	Idiopathic crescentic	2	1
	Unknown	0	0
	Sub total	60	26
Secondary	Other infection	1	0
	Lupus Nephritis	112	49
	Henoch Schonlein Purpura	3	1
	HUS/TTP	0	0
	Amyloidosis	0	0
	Systemic vasculitis	1	0
	Post infection GN	13	6
	Polyarteritis nodosa	0	0
	Malignancy	1	0
	Light/ heavy chain disease	0	0
	Diabetic nephropathy	6	3
	Anti GBM	0	0
	Immunotactoid / fibrillary GN	0	0
	Multiple myeloma	0	0
	Unknown	0	0
	Sub total	137	60
Others		31	14
Total		228	100

* Patients may have either one or more histopathology or not have any histopathology

1.3.3.4: Histopathological diagnosis in patients with nephritic syndrome

In patients presenting with acute nephritic syndrome, the commonest GN is lupus nephritis (48%) Table 1.3.3.4).

Table 1.3.3.4: HPE diagnosis in patients presenting with nephritic syndrome, 2005-2008

Type	Histopathological Diagnosis	n	%
Primary	Minimal Change Disease	16	6
	FSGS	25	9
	Ig A nephropathy	22	8
	Membranous nephropathy	3	1
	Membrano-proliferative	4	1
	Mesangial Proliferative GN-non IgA	4	1
	Crescentic	2	1
	Idiopathic crescentic	6	2
	Unknown	2	1
	Sub total	84	30
Secondary	Other infection	0	0
	Lupus Nephritis	132	48
	Henoch Schonlein Purpura	2	1
	HUS/TTP	0	0
	Amyloidosis	0	0
	Systemic vasculitis	3	1
	Post infectious GN	19	7
	Polyarteritis nodosa	0	0
	Malignancy	0	0
	Light/ heavy chain disease	0	0
	Diabetic nephropathy	5	2
	Anti GBM	0	0
	Immunotactoid / fibrillary GN	0	0
	Multiple myeloma	0	0
	Unknown	0	0
Sub total	161	58	
Others		31	11
Total		276	100

* Patients may have either one or more histopathology or not have any histopathology

1.3.3.5 Primary GN according to various age group

FSGS was the commonest GN in the <15 year age group(45%) followed by minimal change disease(36%). In adults between 25 ≤ 55 years old, minimal change disease(34%) and FSGS(30.5%) were the two commonest GN. The commonest GN in the 15- 25 year age group was minimal change disease (46%). In patients above 55 years of age, the commonest primary GN was membranous nephropathy (33.0%) (Table 1.3.3.5).

Table 1.3.3.5: Primary GN according to the various age group, 2005-2008

Histopathological	<15		15 ≤ 25		25 ≤ 35		35 ≤ 45		45 ≤ 55		55 ≤ 65		≥ 65		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Minimal change disease	114	36	199	46	91	29	46	23	31	23	16	23	6	17	503	33
FSGS	143	45	131	30	99	32	60	30	39	29	17	24	9	25	498	33
Ig A Nephropathy	33	10	64	15	68	22	50	25	26	19	10	14	5	14	256	17
Membranous nephropathy	5	2	11	3	28	9	23	11	28	21	22	31	13	36	130	9
Membrano proliferative	5	2	7	2	8	3	7	3	1	1	3	4	1	3	32	2
Mesangial proliferative	12	4	9	2	9	3	15	7	3	2	1	1	0	0	49	3
Non-Ig A																
Crescentic ANCA	1	0	1	0	1	0	0	0	1	1	0	0	2	6	6	0
Idiopathic crescentic	4	1	8	2	5	2	1	0	4	3	0	0	0	0	22	1
Missing	2	1	2	0	1	0	0	0	2	1	1	1	0	0	8	1
Total	319	100	432	100	310	100	202	100	135	100	70	100	36	100	1504	100

Figure 1.3.3.5: Primary GN according to the various age group, 2005-2008

