

## **CHAPTER 2**

### **Primary Glomerulonephritis**

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**2.1: Introduction**

This chapter covers the main primary glomerulonephritis that were reported to the MRRB from the years 2005-2007, namely minimal change disease, focal segmental glomerulosclerosis, idiopathic membranous glomerulonephritis and IgA nephropathy.

**2.2: Minimal Change Disease**

**2.2.1: Introduction**

Minimal change disease is defined by absence of histological glomerular abnormality. If electron microscopy were performed evidence of epithelial cell foot process fusion would be present.

**2.2.2: Patient population and characteristics**

A total of 224 cases of minimal change disease were reported in 2005-2007. The mean age of the patients at the time of biopsy was 28.6 ± 12.5 (Table 2.2.2) with a clear predominance in second and third decades of life (Table & Figure 2.2.2 (b)). The frequencies of age groups 15 to <25, 25 to <35 and 35 to <45 were 52%, 22% and 14% respectively, which is 88% when combined. The diagnosis of minimal change disease is relatively rare after 55 years of age and our reported frequency was less than 4% in this age group.

There is a higher incidence of minimal change disease in males, with a ratio of 2:1 in the three-year registry data (overall 68% as compared to 32% in the female group. The racial group distribution in Malay, Chinese and Indian was 62%, 14% and 5% respectively.

Table 2.2.2(a): Demographic characteristics for minimal change disease, 2005-2007

Demographic characteristics		n	%
Age		28.6± 12.5 years	
Gender	Male	153	68
	Female	71	32
Race	Malay	139	62
	Chinese	32	14
	Indian	9	5
	Others	44	14

Figure 2.2.2(b): Age at time of biopsy (years) for minimal change disease, 2005-2007

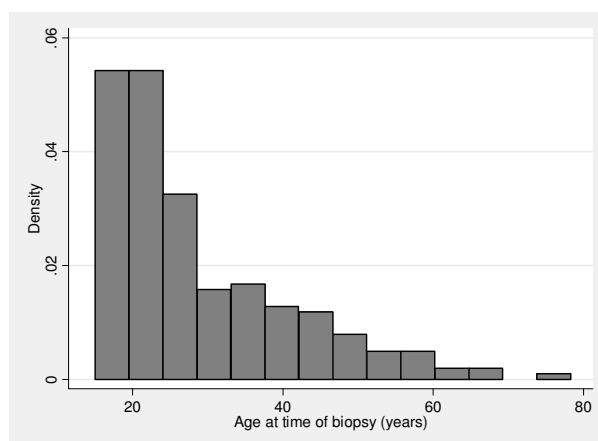


Table 2.2.2(b): Age group at time of biopsy (years) for minimal change disease, 2005-2007

Age group (years)	2005		2006		2007		Total	
	n	%	n	%	n	%	n	%
15-<25	32	42	47	58	37	56	116	52
25-<35	21	29	18	22	10	15	49	22
35-<45	11	14	10	12	10	15	31	14
45-<55	10	13	4	5	4	6	18	8
55-<65	1	1	2	2	4	6	7	3
>65	1	1	1	1	1	2	3	1
<b>Total</b>	<b>76</b>	<b>100</b>	<b>82</b>	<b>100</b>	<b>66</b>	<b>100</b>	<b>224</b>	<b>100</b>

### 2.2.3: Clinical presentation

Nephrotic syndrome, as expected, was the most common presentation (83%). Other presentations were asymptomatic urine abnormality (9%), nephritic syndrome (3%), nephritic-nephrotic syndrome (3%) (Table 2.2.3(a)) Only 6% of patients were hypertensive (Table 2.2.3(b)). The mean level of 24 hours urine protein was  $3.1 \pm 1.1$ g, with a range 0.2-13.4g/day.

Table 2.2.3(a): Overall clinical presentation for minimal change disease, 2005-2007

Clinical Presentation	2005		2006		2007		Total	
	n	%	n.	%	n.	%	n	%
Asymptomatic urine abnormality	4	5	8	11	8	12	20	9
Nephritic syndrome	2	3	2	2	3	5	7	3
Nephrotic syndrome	69	91	68	83	50	75	187	83
Nephritic-Nephrotic syndrome	1	1	2	2	3	5	6	3
Missing	0	0	2	2	2	3	4	2
<b>Total</b>	<b>76</b>	<b>100</b>	<b>82</b>	<b>100</b>	<b>66</b>	<b>100</b>	<b>224</b>	<b>100</b>

Table 2.2.3 (b): Presence of hypertension in minimal change disease, 2005-2007

Hypertension	Total	
	n	%
Present	14	6
Absent	210	94
Missing	0	0
<b>Total</b>	<b>224</b>	<b>100</b>

#### 2.2.3.1: Clinical presentation by age

Nephrotic syndrome consistently predominates as the clinical presentation throughout all age groups.

Table 2.2.3.1: Clinical presentation by age group for minimal change disease, 2005-2007

Clinical presentations	15- <25		25-<35		35-<45		45-<55		55-<65		≥65		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Asymptomatic urine abnormalities	10	9	4	8	4	13	1	5	1	14	0	0	20	9
Nephritic syndrome	3	3	1	2	1	3	1	5	0	0	1	33	7	3
Nephrotic syndrome	96	82	43	88	25	81	16	90	5	72	2	67	187	83
Nephritic-Nephrotic syndrome	5	4	0	0	1	3	0	0	0	0	0	0	6	3
Missing	2	2	1	2	0	0	0	0	1	14	0	0	4	2
<b>Total</b>	<b>116</b>	<b>100</b>	<b>49</b>	<b>100</b>	<b>31</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>7</b>	<b>100</b>	<b>3</b>	<b>100</b>	<b>224</b>	<b>100</b>

**2.2.3.2: Clinical presentation by gender**

There are basically no differences between genders in terms of clinical presentation.

Table 2.2.3.2: Clinical presentation by gender for minimal change disease, 2005-2007

	2005		2006		2007		Total									
	Male	Female	Male	Female	Male	Female	Male	Female								
	n.	%	n	%	n	%	n	%								
Asymp.urine abnormality	2	4	2	8	3	5	5	22	7	16	1	5	12	8	8	11
Nephritic syndrome	0	0	2	8	2	3	0	0	2	5	1	5	4	3	3	4
Nephrotic syndrome	47	94	22	84	51	87	17	74	31	70	19	85	129	84	58	82
Nephritic-nephrotic syndr	1	2	0	0	2	3	0	0	3	7	0	0	6	4	0	0
Missing	0	0	0	0	1	2	1	4	1	2	1	5	2	1	2	3
<b>Total</b>	<b>50</b>	<b>100</b>	<b>26</b>	<b>100</b>	<b>59</b>	<b>100</b>	<b>23</b>	<b>100</b>	<b>44</b>	<b>100</b>	<b>22</b>	<b>100</b>	<b>153</b>	<b>100</b>	<b>71</b>	<b>100</b>

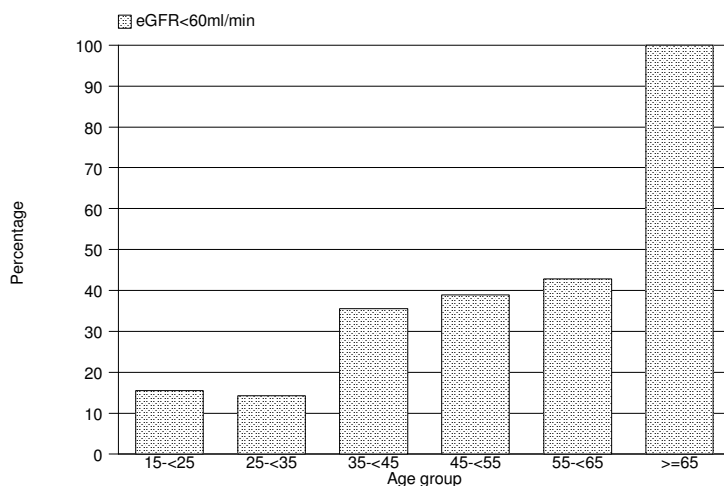
**2.2.4: Renal function at presentation**

The majority (78%) of subjects had eGFR>60: 41% with eGFR>90 ml/min/1.73m<sup>2</sup> and 37% with eGFR 60-89 ml/min/1.73m<sup>2</sup>. About a fifth of the subjects had eGFR < 60 ml/min/1.73m<sup>2</sup> but the majority of these patients (17%) were in the region of estimated eGFR 30-59 ml/min/1.73m<sup>2</sup> (Tables 2.2.4). However, we need to bear in mind the proportion with renal impairment is higher than expected for MCD, as one of the main indications for biopsy would have been renal impairment. In general, the older the patient the higher risk of renal impairment at presentation (Figure 2.2.4).

Table 2.2.4: Renal function at presentation by age group for minimal change disease, 2005-2007

eGFR (ml/min/1.73m <sup>2</sup> )	15- <25		25- <35		35- <45		45- <55		55- <65		≥ 65		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
≥90	61	53	22	45	5	17	3	17	2	29	0	0	93	41
60-89	37	32	20	41	15	48	8	44	2	29	0	0	82	37
30-59	13	11	5	10	10	32	7	39	1	13	2	67	38	17
15-29	5	4	2	4	0	0	0	0	0	0	0	0	7	3
<15	0	0	0	0	1	3	0	0	2	29	1	33	4	2
<b>Total</b>	<b>116</b>	<b>100</b>	<b>49</b>	<b>100</b>	<b>31</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>7</b>	<b>100</b>	<b>3</b>	<b>100</b>	<b>224</b>	<b>100</b>

Figure 2.2.4: Impaired renal function by age group for minimal change disease, 2005-2007



## 2.3: Focal Segmental Glomerulosclerosis

### 2.3.1: Introduction

Focal segmental glomerulosclerosis is defined on histological criteria by segmental capillary obliteration with increased mesangial matrix deposition, intracapillary hyaline deposits and focal adhesions of the capillary tuft to Bowman’s capsule.

### 2.3.2: Patient population and characteristics

A total of 241 cases of FSGS were reported. The mean age at the time of biopsy was  $32.1 \pm 13.5$ . The first three decades of life were the predominant age groups in this type of renal disease. (Table 2.3.2 (b)). After the age of 55, the frequency rate was only 6% compared to other age groups (Table 2.3.2(b))

FSGS was slightly more common in males (56%) compared to females (44%). The distribution according to ethnicity was 61% in Malay, 14% in Chinese, 7% in Indian and 18% in others.

Table 2.3.2(a): Demographic characteristics for FSGS, 2005-2007

Demographic characteristics		n	%
Age		32.1 ± 13.5	
Gender	Male	136	56
	Female	105	44
Race	Malay	147	61
	Chinese	34	14
	Indian	16	7
	Others	44	18

Figure 2.3.2(b): Age at time of biopsy (years) for FSGS, 2005-2007

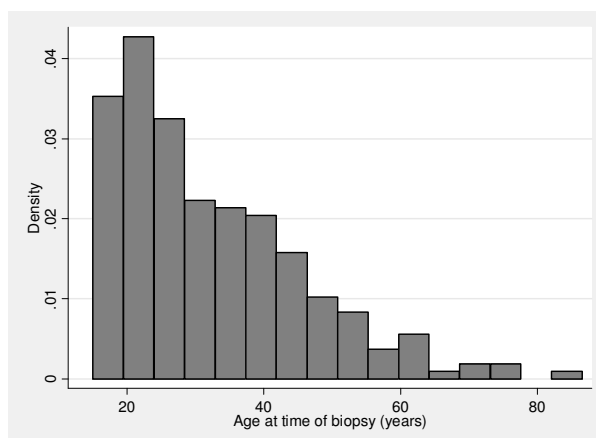


Table 2.3.2(b): Age group at time of biopsy (years) for FSGS, 2005-2007

Age group (years)	2005		2006		2007		Total	
	n	%	n.	%	n	%	n	%
15-<25	18	31	45	42	29	38	92	38
25-<35	16	27	23	22	25	32	64	27
35-<45	13	21	18	17	13	17	44	19
45-<55	8	14	9	9	8	10	25	10
55-<65	3	5	5	5	2	3	10	4
≥65	1	2	5	5	0	0	6	2
<b>Total</b>	<b>59</b>	<b>100</b>	<b>105</b>	<b>100</b>	<b>77</b>	<b>100</b>	<b>241</b>	<b>100</b>

**2.3.3: Clinical Presentation**

Nephrotic syndrome was the most common reported clinical presentation (69%). Other reported presentations were asymptomatic urine abnormality (18%), nephritic syndrome (5%), nephritic-nephrotic syndrome (3%) (Table & Figure 2.3.3(a)). Hypertension was present in 8% (Table 2.3.3 (b)) with a higher likelihood in older age groups. The mean level of 24 hours urine protein was  $3.9 \pm 1.0$  with a range of 2.8 to 8.4g/day.

Table 2.3.3 (a): Overall clinical presentation for FSGS, 2005-2007

Clinical Presentation	2005		2006		2007		Total	
	n	%	n	%	n	%	n	%
Asymptomatic urine abnormality	10	17	19	18	15	19	44	18
Nephritic syndrome	3	5	5	5	4	5	12	5
Nephrotic syndrome	42	71	75	71	50	65	167	69
Nephritic-Nephrotic syndrome	1	2	0	0	6	8	7	3
Missing	3	5	6	6	2	3	11	5
<b>Total</b>	<b>59</b>	<b>100</b>	<b>105</b>	<b>100</b>	<b>77</b>	<b>100</b>	<b>241</b>	<b>100</b>

Figure 2.3.3 (a): Overall clinical presentation for FSGS, 2005-2007

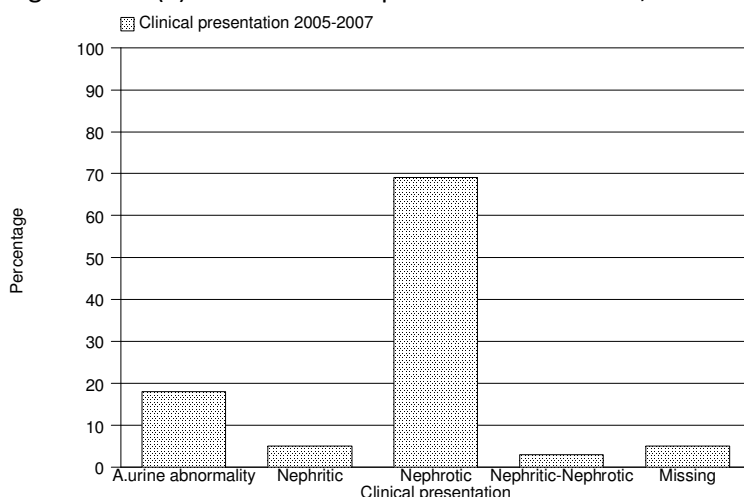


Table 2.3.3 (b): Presence of hypertension in FSGS, 2005-2007

Hypertension	Total	
	n	%
Present	19	8
Absent	222	92
Missing	0	0
<b>Total</b>	<b>241</b>	<b>100</b>

**2.3.3.1: Clinical presentation by age**

Nephrotic syndrome remains the commonest presentation across all age groups, accounting for 55-90% of presentations.

Table 2.3.3.1: Clinical presentation by age group for FSGS, 2005-2007

Age group (years)	15- <25		25-<35		35-<45		45-<55		55-<65		≥ 65		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Asymptomatic urine abnormality	10	12	18	28	13	30	3	12	0	0	0	0	44	18
Nephritic syndrome	4	4	6	9	1	2	0	0	1	10	0	0	12	5
Nephrotic syndrome	74	80	35	55	27	61	18	72	9	90	4	67	167	69
Nephritic-Nephrotic syndrome	2	2	3	5	1	2	1	4	0	0	0	0	7	3
Missing	2	2	2	3	2	5	3	12	0	0	2	33	11	5
<b>Total</b>	<b>92</b>	<b>100</b>	<b>64</b>	<b>100</b>	<b>44</b>	<b>100</b>	<b>25</b>	<b>100</b>	<b>10</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>241</b>	<b>100</b>

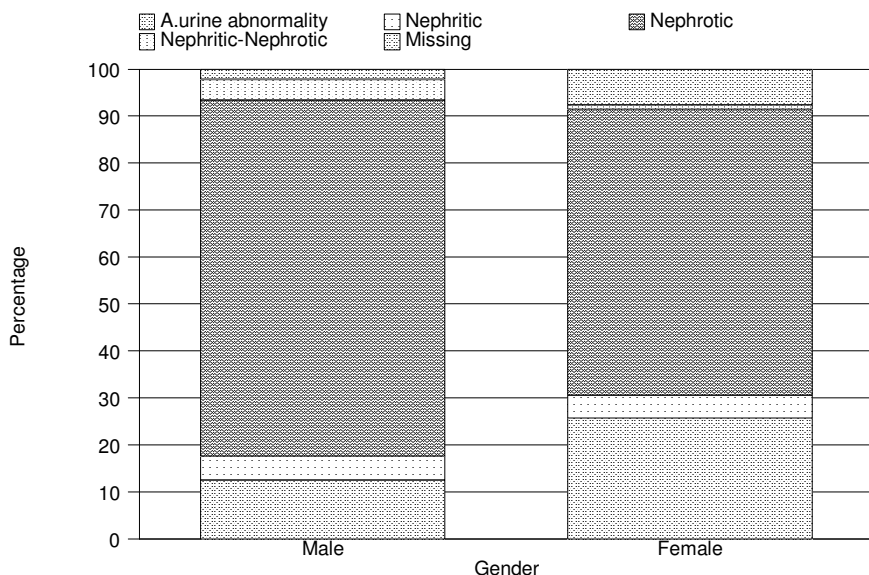
**2.3.3.2: Clinical presentation by gender**

From the 3 years of collected data, nephrotic syndrome appears more common in males while there are more females presenting as asymptomatic urine abnormality. The reason for this is unclear.

Table 2.3.3.2: Clinical presentation by gender for FSGS, 2005-2007

Clinical Presentation	2005				2006				2007				Total			
	Male		Female		Male		Female		Male		Female		Male		Female	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Asymptomatic urine abnormality	3	10	7	25	6	10	13	28	8	17	7	24	17	13	27	26
Nephritic syndrome	1	3	2	7	3	6	2	4	3	6	1	3	7	5	5	5
Nephrotic syndrome	26	84	16	57	46	79	29	62	31	66	19	63	103	76	64	60
Nephritic-Nephrotic syndrome	1	3	0	0	0	0	0	0	5	11	1	3	6	4	1	1
Missing	0	0	3	11	3	5	3	6	0	0	2	7	3	2	8	8
<b>Total</b>	<b>31</b>	<b>100</b>	<b>28</b>	<b>100</b>	<b>58</b>	<b>100</b>	<b>47</b>	<b>100</b>	<b>47</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>136</b>	<b>100</b>	<b>105</b>	<b>100</b>

Figure 2.3.3.2: Clinical presentation by gender for focal segmental glomerulosclerosis, 2005-2007



**2.3.4: Renal function at presentation**

Majority of cases (57%) had eGFR > 60 ml.min.1.73m<sup>2</sup> at presentation (table 2.3.4 (a)). There were 28% of cases in the eGFR range of 30-59 ml/min/1.73m<sup>2</sup>; 12% were 15-29ml/min/1.73m<sup>2</sup> and 3% were <15ml/min/1.73m<sup>2</sup> (Table & Figure 2.3.4.1).

Table 2.3.4(a): Impaired renal function in FSGS by year, 2005-2007

Renal function	2005		2006		2007		Total	
	n	%	n	%	n	%	n	%
eGFR ≥ 60	27	46	64	61	47	61	138	57
eGFR < 60	32	54	41	39	30	39	103	43
<b>Total</b>	<b>59</b>	<b>100</b>	<b>105</b>	<b>100</b>	<b>77</b>	<b>100</b>	<b>241</b>	<b>100</b>

**2.3.4.1 Renal function at presentation by age**

In general, there was a higher risk of renal impairment with increasing age (Table 2.3.4.1 & Figure 2.3.4.1 (a&b)).

Table 2.3.4.1: Renal function at presentation by age group for FSGS, 2005-2007

eGFR (ml/min/1.73m <sup>2</sup> )	15- <25		25- <35		35- <45		45- <55		55- <65		≥65		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
≥90	35	38	16	25	6	14	0	0	0	0	0	0	57	24
60-89	31	34	25	39	11	25	9	36	3	30	2	33	81	33
30-59	20	22	14	22	17	39	10	40	4	40	2	33	67	28
15-29	4	4	9	14	9	20	4	16	2	20	1	17	29	12
<15	2	2	0	0	1	2	2	8	1	10	1	17	7	3
<b>Total</b>	<b>92</b>	<b>100</b>	<b>64</b>	<b>100</b>	<b>44</b>	<b>100</b>	<b>25</b>	<b>100</b>	<b>10</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>241</b>	<b>100</b>

Figure 2.3.4.1(a): Renal function at presentation by age group for FSGS, 2005-2007

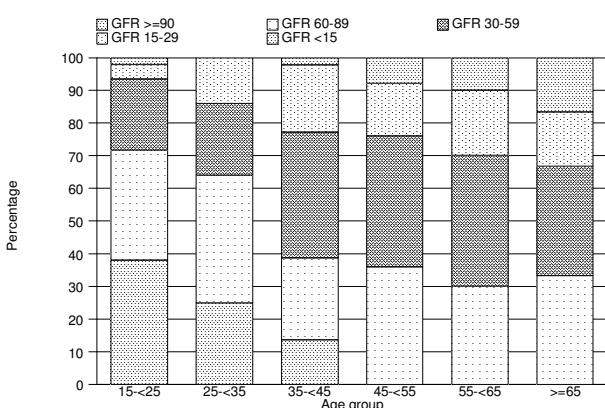
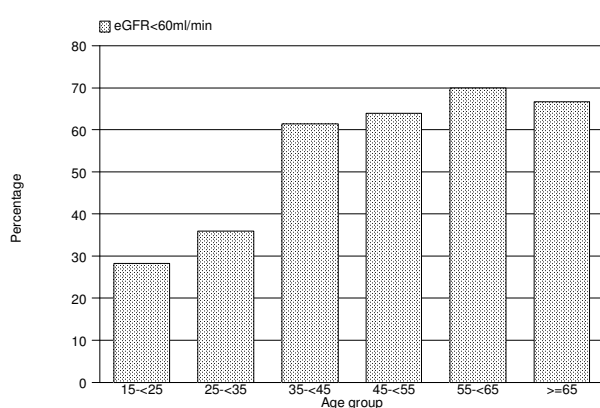


Figure 2.3.4.1(b): Impaired renal function in FSGS by age group, 2005-2007



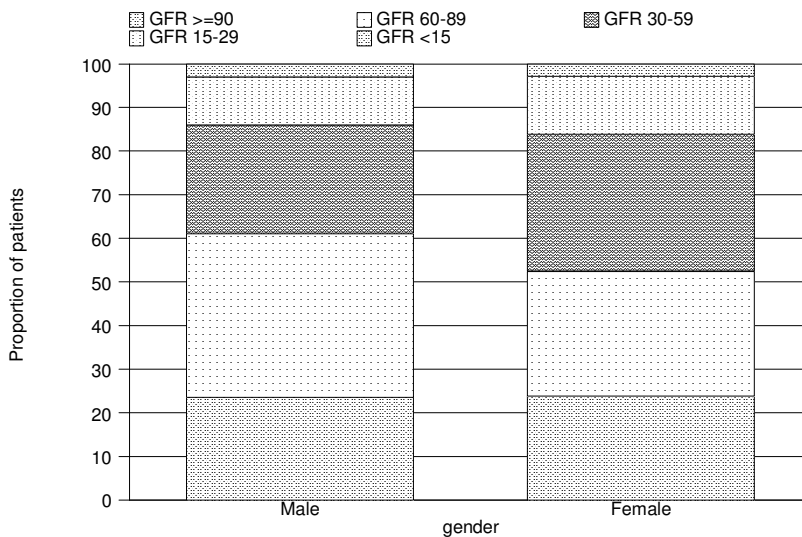
### 2.3.4.2 Renal function at presentation by gender

There were no significant gender differences with respect to renal function at presentation (Table & Figure 2.3.4.2).

Table 2.3.4.2: Renal function at presentation according to gender for FSGS, 2005-2007

eGFR (ml/min/1.73m <sup>2</sup> )	2005				2006				2007				Total			
	Male		Female		Male		Female		Male		Female		Male		Female	
	n	%	n.	%	No.	n	n	%	n	%	n	%	n.	%	n	%
≥90	9	29	4	14	16	28	11	23	7	14	10	34	32	24	25	24
60-89	7	23	7	25	23	40	14	30	21	45	9	30	51	37	30	29
30-59	10	32	11	39	12	20	13	28	12	26	9	30	34	25	33	31
15-29	3	10	5	18	6	10	8	17	6	13	1	3	15	11	14	13
<15	2	6	1	4	1	2	1	2	1	2	1	3	4	3	3	3
<b>Total</b>	<b>31</b>	<b>100</b>	<b>28</b>	<b>100</b>	<b>58</b>	<b>100</b>	<b>47</b>	<b>100</b>	<b>47</b>	<b>100</b>	<b>30</b>	<b>100</b>	<b>136</b>	<b>100</b>	<b>105</b>	<b>100</b>

Figure 2.3.4.2: Renal function at presentation according to gender for FSGS, 2005-2007



## 2.4: Idiopathic Membranous Nephropathy

### 2.4.1 Introduction

Membranous nephropathy is characterised by subepithelial immune deposits with spikes and thickening of the basement membrane. In Malaysia, this form of glomerulonephritis comprised only 8% of the total primary glomerulonephritis diagnosed, which is an unusually small number.

### 2.4.2: Patient population and characteristics

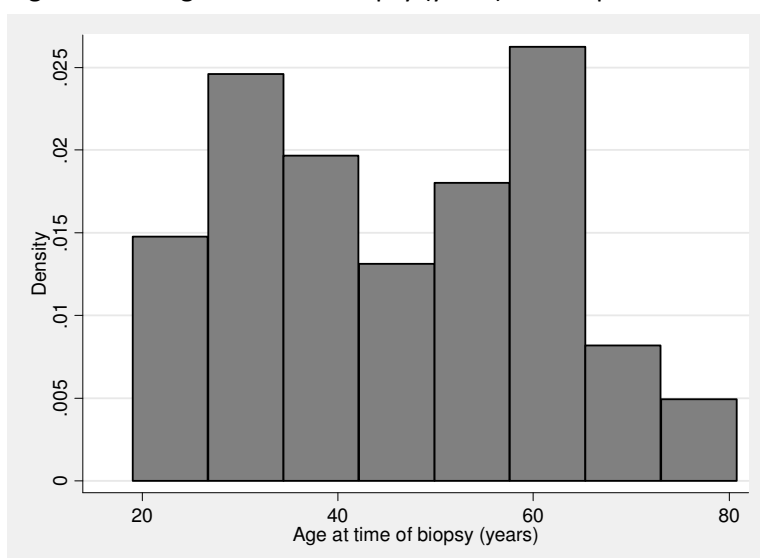
Over the three year period from 2005-2007, 79 cases of Idiopathic membranous nephropathy were reported. The mean age at biopsy was 46 + 15.5 years, with a range between 19 and 80.8 years. Similar to that described in literature<sup>(1,2)</sup>, there is a bi-modal peak in incidence, the first peak seen at 25-<35 years and the second in the 45-<65 years age groups ( Figure 2.4.2).

Overall, there was slightly more male than female (Table 2.4.2). The overall racial distribution was 39% in Malays, 43% in Chinese, 4% in Indians and 10% in others. Data were missing in 4% of cases.

Table 2.4.2: Demographic characteristics for idiopathic membranous nephropathy, 2005-2007

Demographic characteristics		N=79	(%)
Age		46 ± 15.5	
Gender	Male	40	51
	Female	36	46
	Missing	3	3
Race	Malay	31	39
	Chinese	34	43
	Indian	3	4
	Others	8	10
	Missing	3	4

Figure 2.4.2: Age at time of biopsy (years) for idiopathic membranous nephropathy, 2005-2007



### 2.4.3: Clinical presentation

A little over half of the patients (57%) presented with overt nephrotic syndrome. Asymptomatic urinary abnormalities, nephritic syndrome and nephritic-nephrotic syndrome were found in 19%, 3% and 3% respectively (Table and Figure 2.4.3 (a)). Hypertension was present in 13% (Table 2.4.3(b)). The mean level of proteinuria was  $4.8 \pm 2.7$ g/d with a range from 1.7-19.8 g/d.

Table 2.4.3(a): Overall clinical presentation for idiopathic membranous nephropathy, 2005-2007

Clinical Presentations	2005		2006		2007		Total	
	n	%	n	%	n	%	n	%
Asymptomatic urine abnormality	1	5	7	22	7	27	15	19
Nephritic syndrome	1	5	1	3	0	0	2	3
Nephrotic syndrome	18	85	21	66	18	69	57	71
Nephritic-Nephrotic syndrome	1	5	1	3	0	0	2	3
Missing	0	0	2	6	1	4	3	4
<b>Total</b>	<b>21</b>	<b>100</b>	<b>32</b>	<b>100</b>	<b>26</b>	<b>100</b>	<b>79</b>	<b>100</b>

Figure 2.4.3(a): Overall clinical presentation for idiopathic membranous nephropathy, 2005-2007

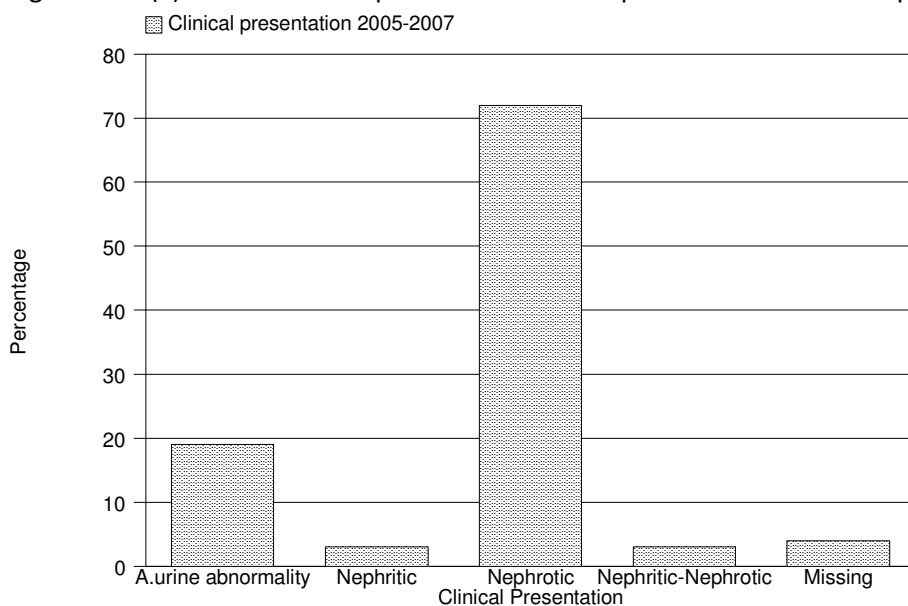


Table 2.4.3 (b): Presence of hypertension in idiopathic membranous nephropathy, 2005-2007

Hypertension	Total	
	n	%
Present	10	13
Absent	69	87
<b>Total</b>	<b>79</b>	<b>100</b>

**2.4.3.1: Clinical Presentation by age**

Nephrotic syndrome appeared to be the commonest clinical presentation in the younger age group. In the older patients, asymptomatic urine abnormality occurred at a higher frequency. (Table 2.4.3.1)

Table 2.4.3.1: Clinical presentation by age group for idiopathic membranous nephropathy, 2005-2007

Clinical Presentation	15- <25		25-<35		35-<45		45-<55		55-<65		≥65		Total	
	n	%	n	%	n	%	n	%	n	%	n	n	n	%
Asymptomatic urine abnormality	1	14	3	17	1	8	4	25	6	40	0	0	15	19
Nephritic syndrome	0	0	0	0	0	0	1	6	1	7	0	0	2	3
Nephrotic syndrome	5	72	14	77	11	84	10	63	7	47	10	100	57	71
Nephritic-Nephrotic syndrome	1	14	0	0	0	0	1	6	0	0	0	0	2	3
Missing	0	0	1	6	1	8	0	0	1	6	0	0	3	4
<b>Total</b>	<b>7</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>16</b>	<b>100</b>	<b>15</b>	<b>100</b>	<b>10</b>	<b>100</b>	<b>79</b>	<b>100</b>

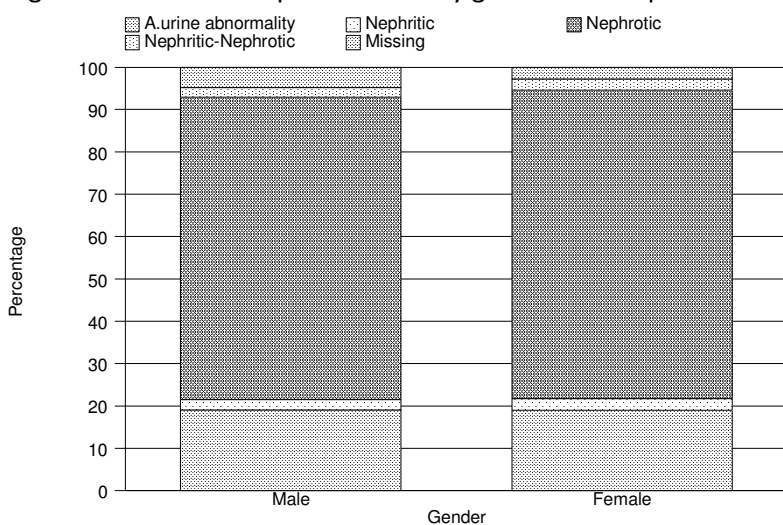
**2.4.3.2: Clinical presentation by gender**

Nephrotic syndrome was the commonest presentation in both genders. (Table& Figure 2.4.3.2)

Table 2.4.3.2: Clinical presentation by gender for idiopathic membranous nephropathy, 2005-2007

Clinical Presentations	Male		Female	
	n	%	n	%
Asymptomatic urine abnormality	8	20	7	19
Nephritic syndrome	1	2	1	3
Nephrotic syndrome	30	71	27	72
Nephritic-Nephrotic syndrome	1	2	1	3
Missing	2	5	1	3
<b>Total</b>	<b>42</b>	<b>100</b>	<b>37</b>	<b>100</b>

Figure 2.4.3.2: Clinical presentation by gender for idiopathic membranous nephropathy, 2005-2007



**2.4.4: Renal function at presentation**

Majority of cases (62%) had eGFR > 60 ml.min.1.73m<sup>2</sup> at presentation. There were 25% of cases in the eGFR range of 30-59 ml/min/1.73m<sup>2</sup>; 10% were 15-29ml/min/1.73m<sup>2</sup> and 3% were <15ml/min/1.73m<sup>2</sup> (Table & Figure 2.4.4(a)).

There is an increased incidence of renal impairment with increasing age (Table & Figure 2.4.4(a)) and in the male gender .Up to 45% of males vs. 30% females had a eGFR < 60 ml.min.1.73m<sup>2</sup> at presentation. (Table 2.4.4(b)).

Table 2.4.4 (a): Renal function at presentation by age group for idiopathic membranous nephropathy, 2005-2007

eGFR (ml/min/1.73m <sup>2</sup> )	15- <25		25- <35		35- <45		45- <55		55- <65		≥65		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
≥90	4	57	6	33	1	8	2	12	3	20	0	0	16	20
60-89	3	43	12	67	6	45	7	44	4	27	1	10	33	42
30-59	0	0	0	0	4	31	7	44	4	27	5	50	20	25
15-29	0	0	0	0	1	8	0	0	3	20	4	40	8	10
<15	0	0	0	0	1	8	0	0	1	6	0	0	2	3
<b>Total</b>	<b>7</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>16</b>	<b>100</b>	<b>15</b>	<b>100</b>	<b>10</b>	<b>100</b>	<b>79</b>	<b>100</b>

Figure 2.4.4 (a): Renal function at presentation by age group for idiopathic membranous nephropathy, 2005-2007

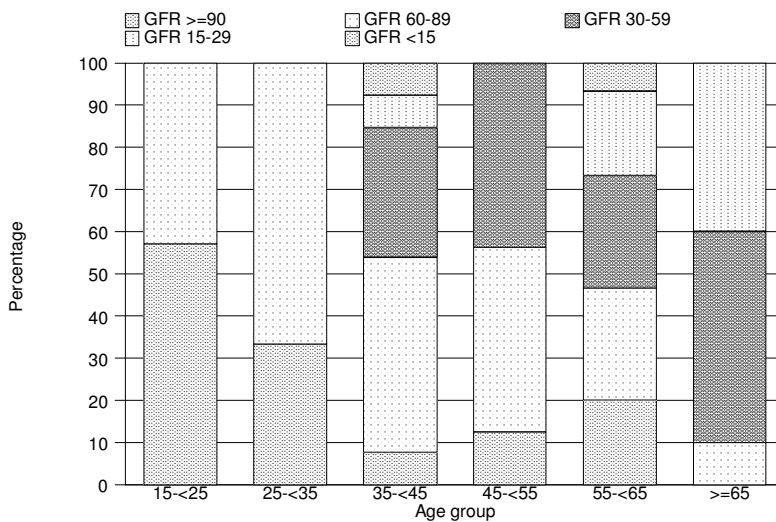


Table 2.4.4(b): Renal function at presentation according to gender for idiopathic membranous nephropathy, 2005-2007

eGFR (ml/min/1.73m <sup>2</sup> )	Male		Female	
	n	%	n	%
≥90	3	7	13	35
60-89	20	48	13	35
30-59	12	29	8	22
15-29	6	14	2	5
<15	1	2	1	3
<b>Total</b>	<b>42</b>	<b>100</b>	<b>37</b>	<b>100</b>

## 2.5: IgA Nephropathy (IgAN)

### 2.5.1 Introduction

IgAN is defined by the predominant deposition of IgA in the glomerular mesangium although light microscopic appearances and clinical features can vary considerably due to the various patterns of histopathologic injury found in this type of glomerulonephritis.

### 2.5.2 Patient population and characteristics

One hundred and twenty seven cases of IgA nephropathy were reported to the registry over the 3 year period of data collection. The mean age at biopsy was  $33.7 \pm 12.4$  years but there was a wide age range from 15 to 85.3 years. The majority of cases biopsied clustered around the 15 to 45-year age groups, peaking at the 25-<35 age group (Table & Figure 2.5.2(b)). Unlike the male preponderance of IgAN reported in literature, our data suggests an opposite trend. This may be due to the limited time period of data collection. The overall ethnic distribution was 48% in Malays, 27% in Chinese, 9% in Indians and 16% in others. (Table 2.5.2)

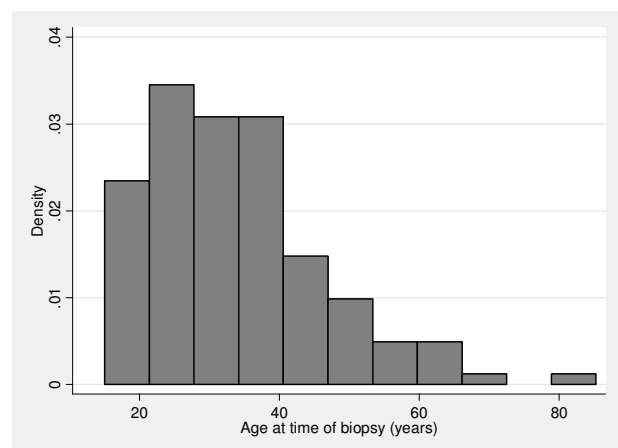
Table 2.5.2 (a): Demographic characteristics of patients with IgA nephropathy, 2005-2007

Demographic characteristics		N=127	(%)
Age		33± 12.4	
Gender	Male	56	44
	Female	71	56
Race	Malay	61	48
	Chinese	34	27
	Indian	12	9
	Others	20	16

Table 2.5.2 (b): Age group at time of biopsy (years) for IgA nephropathy, 2005-2007

Age group (years)	2005		2006		2007		Total	
	n	%	n	%	No.	%	n	%
15-<25	4	13	16	31	14	31	34	27
25-<35	11	37	14	27	16	36	41	32
35-<45	10	33	11	21	7	16	28	21
45-<55	2	7	8	15	6	13	16	13
55-<65	2	7	2	4	2	4	6	5
≥65	1	3	1	2	0	0	2	2
<b>Total</b>	<b>30</b>	<b>100</b>	<b>52</b>	<b>100</b>	<b>45</b>	<b>100</b>	<b>127</b>	<b>100</b>

Figure 2.5.2 (b): Age at time of biopsy (years) for IgA nephropathy, 2005-2007



### 2.5.3: Clinical presentation

There is a wide range of clinical presentations in IgAN. Overall, 50% presented with some form of asymptomatic urinary abnormality. Up to 25% of those who were biopsied had nephrotic syndrome (Table & Figure 2.5.3 (a)). This figure is higher than the 5% quoted in literature<sup>(5,6)</sup> and may reflect relatively conservative local practices with regards to investigation of asymptomatic urinary abnormalities. Up to 25% of patients were hypertensive (Table 2.5.3 (b)). The mean level of proteinuria at biopsy was  $3.8 \pm 0.9$  g/d with a range from 2.8- 8.4 g/d.

Table 2.5.3 (a): Overall clinical presentation for IgA nephropathy, 2005-2007

Clinical presentation	2005		2006		2007		Total	
	n	%	n	%	n	%	n	%
Asymptomatic urine abnormality	18	60	21	40	25	56	64	50
Nephritic syndrome	1	3	3	6	4	9	8	6
Nephrotic syndrome	8	27	16	31	8	17	32	25
Nephritic-Nephrotic syndrome	0	0	3	6	4	9	7	6
Missing	3	10	9	17	4	9	16	13
<b>Total</b>	<b>30</b>	<b>100</b>	<b>52</b>	<b>100</b>	<b>45</b>	<b>100</b>	<b>127</b>	<b>100</b>

Figure 2.5.3 (a): Overall clinical presentation for IgA nephropathy, 2005-2007

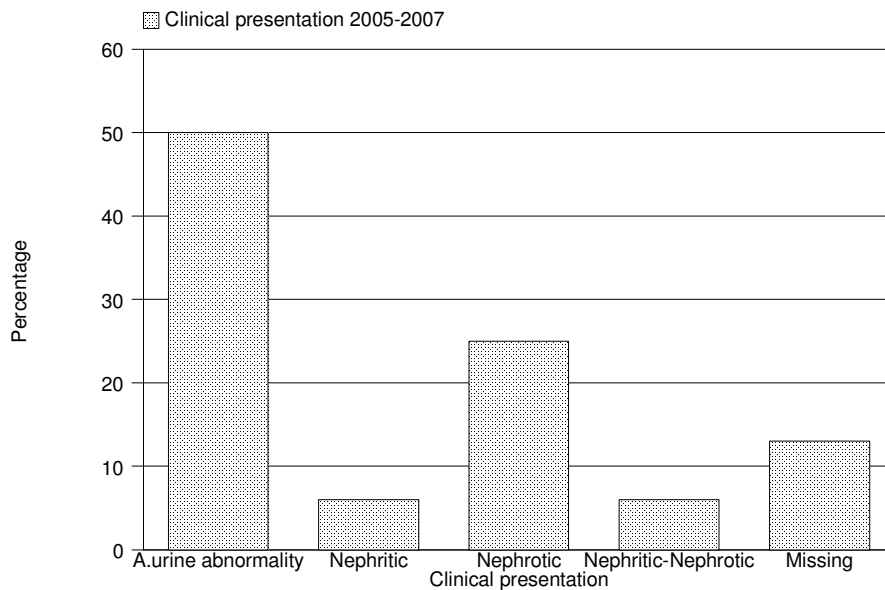


Table 2.5.3 (b): Presence of hypertension in IgA nephropathy, 2005-2007

Hypertension	Total	
	n	%
Present	31	24
Absent	96	76
<b>Total</b>	<b>127</b>	<b>100</b>

**2.5.3.1: Clinical presentation by age**

Comparisons across age groups are limited by the small numbers of patients in older age groups particularly those aged 55 years and above.

Table 2.5.3.1: Clinical presentation by age group for IgA nephropathy, 2005-2007

Age group (years)	15- <25		25-<35		35-<45		45-<55		55-<65		≥65		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Asymptomatic urine abnormality	11	32	24	59	17	61	8	50	4	66	0	0	64	50
Nephritic syndrome	5	15	2	5	1	4	0	0	0	0	0	0	8	6
Nephrotic syndrome	12	35	8	19	8	28	4	24	0	0	0	0	32	25
Nephritic-Nephrotic syndrome	2	6	2	5	0	0	2	13	1	17	0	0	7	6
Missing	4	12	5	12	2	7	2	13	1	17	2	100	16	13
<b>Total</b>	<b>34</b>	<b>100</b>	<b>41</b>	<b>100</b>	<b>28</b>	<b>100</b>	<b>16</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>2</b>	<b>100</b>	<b>127</b>	<b>100</b>

**2.5.3.2: Clinical presentation by gender**

There were no differences in clinical presentation according to gender.

Table 2.5.3.2: Clinical presentation by gender for IgA nephropathy, 2005-2007

Clinical presentation	Male		Female	
	No.	%	No.	%
Asymptomatic urine abnormality	25	45	39	55
Nephritic syndrome	4	7	4	6
Nephrotic syndrome	15	27	17	23
Nephritic-Nephrotic syndrome	3	5	4	6
Missing	9	16	7	10
<b>Total</b>	<b>56</b>	<b>100</b>	<b>71</b>	<b>100</b>

### 2.5.4: Renal function at presentation

Half of the patients (48%) had eGFR < 60ml/min/1.72m<sup>2</sup> at presentation as expected, there is a tendency for older patients to have a greater degree of renal impairment when compared to younger age groups (Table 2.5.4 (a)). The distribution of level of renal function is shown in Table & Figure 2.5.4 (b). Male tend to have worse renal function compared to female, with 57% of male and only 42% of female had eGFR less than 60 ml/min/1.73 m<sup>2</sup>(Table 2.5.4(c)).

Figure 2.5.4 (a): Impaired renal function by age group, 2005-2007

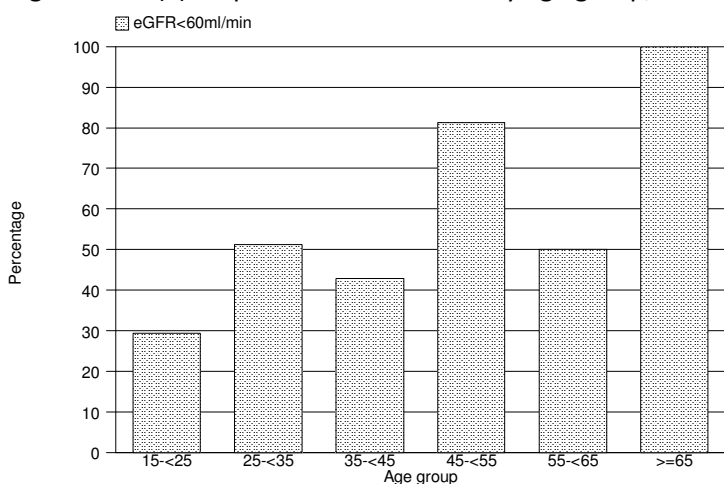


Table 2.5.4 (b): Renal function at presentation by age group for IgA nephropathy, 2005-2007

eGFR (ml/min/1.73m <sup>2</sup> )	15- <25		25- <35		35- <45		45- <55		55- <65		≥ 65		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
≥90	9	26	5	12	3	11	0	0	1	17	0	0	18	14
60-89	15	44	15	37	13	46	3	19	2	33	0	0	48	38
30-59	6	18	10	24	7	25	9	56	2	33	0	0	34	27
15-29	2	6	6	15	4	14	1	6	0	0	1	50	14	11
<15	2	6	5	12	1	4	3	19	1	17	1	50	13	10
<b>Total</b>	<b>34</b>	<b>100</b>	<b>41</b>	<b>100</b>	<b>28</b>	<b>100</b>	<b>16</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>2</b>	<b>100</b>	<b>127</b>	<b>100</b>

Figure 2.5.4 (b): Renal function at presentation by age group for IgA nephropathy, 2005-2007

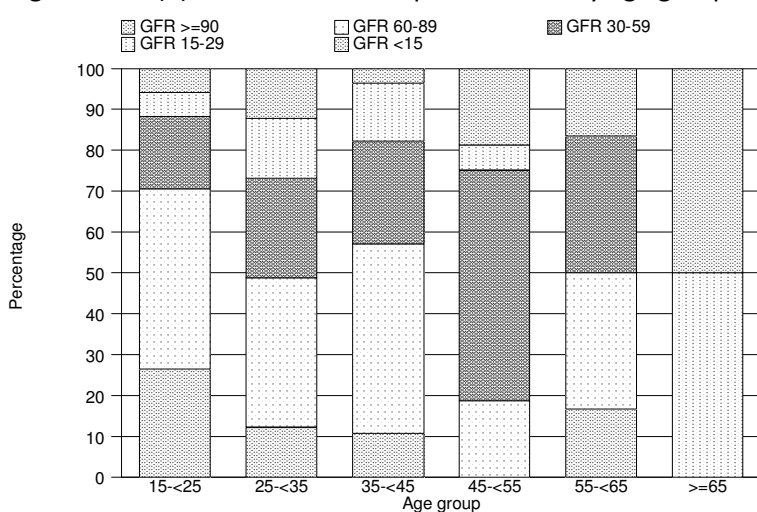


Table 2.5.4 (c): Renal function at presentation according to gender for IgA nephropathy, 2005-2007

eGFR (ml/min/1.73m <sup>2</sup> )	Male		Female	
	n	%	n	%
≥90	10	18	8	11
60-89	15	27	33	47
30-59	15	27	19	27
15-29	9	15	5	7
<15	7	13	6	8
<b>Total</b>	<b>56</b>	<b>100</b>	<b>71</b>	<b>100</b>

**References:**

1. Cattran DC. Idiopathic membranous glomerulonephritis. *Kidney Int* 2001, 59:1983-94.
2. Couser WG, Alpers CE. Membranous nephropathy. In: *Immunologic renal diseases*. Edited by Neilson EG, Couser WG. Lippincott Williams and Wilkins: 2001 ch 43: 1029- 36.
3. Couser WG, Shankland SJ. Membranous nephropathy. In: *Comprehensive Clinical Nephrology*. Edited by Feehally J, Johnson RJ. Mosby Elsevier Limited: 2003 ch 22: 295-307.
4. Zuchelli IP, Cagnoli L, Pasquali C. Clinical and morphologic evolution of idiopathic membranous nephropathy. *Am J Kidney Dis* 1986, 25:282-8.
5. Hogan SL, Muller KE, Jennette JC, FalkRJ. A review of therapeutic studies of idiopathic membranous glomerulopathy. *Am J Kidney Dis* 1995, 25:862-8.
6. Feehally J. IgA Nephropathy and Henoch-Schonlein Nephritis. In: *Comprehensive Clinical Nephrology*. Edited by Feehally J, Johnson RJ. Mosby Elsevier Limited: 2003 ch 24: 319-330.
7. Barratt J and Feehally J. IgA Nephropathy. *J Am Soc Nephrol* 2005,16:2088-97.