

## Brief Communication

# The Spectrum of Glomerular Diseases on Renal Biopsy: Data From A Single Tertiary Center In Oman

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Received: 13 Mar 2013 / Accepted: 21 Apr 2013  
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### Abstract

**Objective:** To study the pattern of glomerular disease (GD) from the result of renal biopsies at our center.

**Methods:** We conducted a retrospective review of 190 adult native renal biopsy reports from the pathology registry of renal biopsy performed at our hospital between 1992 and 2010.

**Results:** Lupus nephritis was the most common pathology 48/133 (36.1%) with a female preponderance. The most common primary glomerular disease was focal segmental glomerulosclerosis (FSGS) 26/133(19.5%), followed by membranous glomerulopathy (MGN) 13/133 (9.8%), and mesangial proliferative glomerulonephritis 6/133 (4.5%). IgA nephropathy and acute proliferative glomerulonephritis each accounted for 4/133 (3.0%). Membranoproliferative glomerulonephritis accounted for 3/133 (2.3%). Focal proliferative and crescentic glomerulonephritis each accounted for 2/133 (1.5%). Vasculitis was not common and there was no report of anti-GBM disease.

**Conclusion:** Among the secondary glomerular diseases, lupus nephritis was the commonest condition with a female preponderance. Among the primary glomerular diseases, FSGS was the commonest. These results are consistent with global trend. IgA nephropathy is not common as the case in the Caucasian population. Vasculitis was not common and there was no report of anti-GBM disease.

**Keywords:** Renal biopsy; Glomerular disease; Epidemiology.

### Introduction

The incidence of glomerular disease has changing patterns depending on age, ethnicity, and geographic regions and also influenced by environmental, nutritional and socioeconomic factors. It is important to recognize the glomerular disease pattern and incidence in any given geographical area to understand the etiology as well as factors leading to progression of the disorder to end-stage renal disease (ESRD). To establish data on the spectrum of glomerular disease in the Sultanate of Oman, we reviewed the reports of renal biopsies performed between 1992 and 2010 at

Sultan Qaboos University Hospital, which is one of only two tertiary care centers dealing with renal biopsies in Oman.

### Methods

A retrospective review of the adult (>18 years) native renal biopsy reports from the pathology registry of renal biopsy performed at our hospital between 1992 and 2010 was conducted. We analyzed the data from Sultan Qaboos University Hospital which is one of the two tertiary care centers dealing with renal biopsies in Oman. All the biopsies were performed under ultrasound guidance. Renal reports from nephrectomy and mass biopsy were excluded. Thirteen reports of normal renal tissue were excluded in the analysis. The reports were from a single experienced nephropathologist. The interpretation of the renal pathology was based on examination by light microscopy, immunofluorescence (IF), and electron microscopy (EM). However, 11/133 (8.2%) biopsies were not examined by EM.

### Results

There were 133 biopsy reports after exclusion of the biopsies from pediatric patients, renal grafts, renal masses and nephrectomies. There were 85/133 (63.9%) female patients and 48/133 (36.1%) male patients of ages ranging from 18 to 90 year. There was a variety of indications for the reviewed biopsies which included proteinuria, hematuria, and unexplained renal impairment. The spectrum of the pathological diagnosis is presented in Table 1. Lupus glomerulonephritis was the most common pathology 48/133 (36.1%) with a female preponderance. The most common primary glomerular disease was FSGS 30/190 (15.8%) followed by MGN 13/133 (9.8%) and mesangial proliferative glomerulonephritis 6/133 (4.5%). IgA nephropathy and acute proliferative glomerulonephritis each accounted for 4/133 (3.0%). Membranoproliferative glomerulonephritis accounted for 3/133 (2.3%). Focal proliferative and crescentic glomerulonephritis each accounted for 2/133 (1.5%). Among the secondary glomerular diseases, after lupus nephritis, diabetes nephropathy was reported in 5/133 (3.8%). Tubulointerstitial nephritis (TIN) and thrombotic microangiopathy each accounted for 2/133 (1.5%) of all renal biopsies. Amyloidosis was reported in 3/133 (2.3%). There was no report of anti-GBM disease. We did not find a change in the pattern

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of the glomerular diseases over the span of the study period when compared by decade, 1992-2000 and 2001-2010. (Table 2)

**Table 1:** Spectrum of pathological diagnosis.

Pathological Diagnosis	Male	Female	Percentage
Focal Segmental Glomerulosclerosis	11	15	19.5%
Membranous Glomerulopathy	8	5	9.8%
Chronic Glomerulonephritis	6	4	7.5%
Mesangial Proliferative Glomerulonephritis	2	4	4.5%
Diabetic Glomerulonephritis	4	1	3.8%
IgA Nephritis	2	2	3.0%
Acute Proliferative Glomerulonephritis	3	1	3.0%
Membranoproliferative Glomerulonephritis	1	2	2.3%
Acute Tubular Necrosis	0	3	2.3%
Amyloidosis	2	1	2.3%
Focal Proliferative Glomerulonephritis	0	2	1.5%
Crescentic Glomerulonephritis	2	0	1.5%
Tubulo-Interstitial Nephritis	1	1	1.5%
Thrombotic Microangiopathy	2	0	1.5%
<b>Total</b>	<b>48</b>	<b>85</b>	

## Discussion

Lupus glomerulonephritis was the most common pathology with a female preponderance, a finding consistent with reports from Arab as well as other regions.<sup>1-5</sup> We showed, in contrast to other studies, that GD is more common in females.<sup>1-3, 6, 7</sup> This can be explained by the domination of the number of reports with lupus nephritis. This study showed that FSGS followed by MGN were the commonest primary GD. This is similar to the reports from USA and other North American countries.<sup>8,9,10</sup> This is also consistent with the reports from the Arabian Gulf countries. In the Kingdom of Bahrain, Al Arrayed et al.<sup>1</sup> reported MCD as being the commonest primary GD followed by FSGS; however, in their analysis, they have included pediatric patients. If pediatric patients were excluded FSGS would likely be the most common disease. In Saudi Arabia, FSGS was the most common primary GN in reports from the central and eastern regions.<sup>3,11,12,13</sup> However, reports from the Western region of Saudi Arabia demonstrated that MGN is the most common primary GN in adults.<sup>14</sup> Similar results with high MGN frequency are demonstrated in a study from Iran.<sup>15</sup> The high frequency of FSGS and MGN reported in this study is also demonstrated in a large series of 1,793 adult patients from a single center in Pakistan.<sup>16</sup>

IgA nephropathy was reported in only four patients in this study. Three of them were Indian in origin. Similarly, reports

**Table 2:** Spectrum of pathological diagnosis by decades.

Pathological Diagnosis	Decade			
	1992-2000		2001-2010	
	No.	%	No.	%
Lupus Nephritis	19	37.3%	29	35.4%
Focal Segmental Glomerulosclerosis	6	11.8%	20	24.4%
Membranous Glomerulopathy	2	3.9%	11	13.4%
Chronic Glomerulonephritis	7	13.7%	3	3.7%
Mesangial Proliferative Glomerulonephritis	4	7.8%	2	2.4%
Diabetic Glomerulonephritis	2	3.9%	3	3.7%
IgA Nephritis	4	7.8%	0	0.0%
Acute Proliferative Glomerulonephritis	2	3.9%	2	2.4%
Membranoproliferative Glomerulonephritis	1	2.0%	2	2.4%
Acute Tubular Necrosis	2	3.9%	1	1.2%
Amyloidosis	0	0.0%	3	3.7%
Focal Proliferative Glomerulonephritis	0	0.0%	2	2.4%
Crescentic Glomerulonephritis	0	0.0%	2	2.4%
Tubulo-Interstitial Nephritis	2	3.9%	0	0.0%
Thrombotic Microangiopathy	0	0.0%	2	2.4%
<b>Total</b>	<b>51</b>		<b>82</b>	

from neighboring countries such as United Arab Emirates,<sup>4</sup> Saudi Arabia,<sup>3</sup> Bahrain,<sup>1</sup> and Iran,<sup>15</sup> demonstrated lower rates among the primary GD in contrast to the reported rates from Europe,<sup>17</sup> where IgA is the leading cause of GD, USA,<sup>9</sup> Brazil,<sup>18</sup> and the Far East.<sup>19,20</sup> There were six reports of mesangial proliferative glomerulonephritis. This histological finding is usually due to IgA nephropathy or lupus nephritis. All the six were examined by IF with no IgA stain. There was no pathological evidence to suggest lupus nephritis like subendothelial deposit or a full-house picture on IF, and when EM was done, there were no reticulo-inclusion bodies. As this was a review on biopsy report, further clinical and serological correlation was only done using the information provided in the biopsy request.

There were more reports of lupus nephritis, FSGS, and MGN in the second decade of the study period. This is because there were fewer renal biopsies done between 1992-2000 due to unavailability of nephrology service for several years, rather than a true increase in the incidence of the diseases. We could not assess the rates of the GD in Oman because we only analyzed the data from Sultan Qaboos University Hospital which is one of the two tertiary care centers dealing with renal biopsies in Oman.

## Conclusion

The spectrum of glomerular diseases in this study is consistent with the global trend except for IgA nephropathy, vasculitis, and anti-

GBM disease. However, being a single-center study, our findings do not reveal the spectrum of diseases in Oman. It is necessary to establish a single national renal biopsy registry in Oman so that data can be compared.

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