

Table 3: Comparisons of some basic data and common diseases in this study with other studies

Comparisons of some basic data and common diseases in our series with other published studies									
Variables	Present study*	Nims(4) *	CMC[22]	PGI[23]**	Pakistan[21]*	China[24]	Korea[3]	Japan[9]***	UAE[5]
Duration	2008-2014	1990-2008	1986-2002		1995-2008	1979-2000	1987-2006	1985-1993	1978-1996
Total no.	624	1849	5415	2947	1793	10002	1818	1850	490
M:F	1.07:1	1.5:1			1.6:1	1:03	1.02:1		
mean age		32.27±18.4			32.9±12.8	31.4±13			
PGD	60.25	69.1	71	69	73	71	74		77.1
SGD	13.78	18.2		31	10.9	23	11.8		
TIN	16.66	6.7	3.6		11.6	3.2			
MCD	12.33	15.1	10.8	23	5.8	0.93	15.5	17.5	18.3
FSGS	11.05	10.5	16.8	9	21.2	6	5.6	4.6	18.3
Mes.PGN	3.52	5.2	7.3	3	1.9	25.62			
MPGN	6.57	3.9	2.9	18	1.1	3.38	4	7.5	
MN	9.77	7	9.5	10	17.2	9.89	12.3	10.6	20.1
Chroni GN	3.36	6.7		7	11.6				
DPGN	3.52	4.7			19			41.9	
IgA N	3.52	4.4	8.4	4	1.5	40	28.3	47.4	6.3
ESRD	1.76	2	4.2				0.5	1.3	
LN	8.65	14.6	6.9	22	4.9	54.3	74		40.7
AM	0.32	1.5	1	39	4.6	2.2			33.3
DN	1.44	1.2	2.8	20	0.9	7.35	16.7		
MM	0.48	0.4				0.89			
HUS	1.76	0.3			0.6				
VASULITIS	0.16	0.7		4	0.3				

Indicates non availability of data for the particular variable. NIMS= Nizam's Institute of Medical Sciences, Hyderabad India, CMC = Christian Medical College, Vellore, India; UAE = United Arab Emirates; PGI = Postgraduate Institute of Medical Education and Research, Chandigarh, India. *These figures indicate percentage of total renal diseases. **Data for glomerular diseases only and percentage calculated out of total primary GD and secondary GD separately. ***Only primary GD. Rest of the studies percentage were calculated from total primary GD and secondary GD separately.

Similar to the majority of other studies worldwide, PGN was the predominant renal disease in our study (3, 4, 5, 21, 22, 23, 24), followed by TIN and SGN. CKD & vascular nephropathies were less frequent in majority of the studies. From this data and analysis, we did not observe any hereditary GD which may be due to the non availability of EM or it can be diagnosed by other noninvasive methods. We also observed a male predominance in the majority of cases except in SGN where there is strong female predominance. This reflects the increased prevalence of LN in the female population. All studies worldwide showed a similar pattern.

In this study NS was the most common clinical indication for renal biopsy accounting for 39% of the total cases which is similar to other studies around the world, including South India (4, 6, 10, 21, 22, 25). However, asymptomatic urinary abnormality was more frequent in the Japanese study, because a greater tendency to biopsy in patients with hematuria and asymptomatic proteinuria (9).

In NS underlying etiology is widely variable in different regions of the world. In our study, the most common cause was MCD, followed by FSGS, MN, three most frequently

diagnosed PGD, comprising 55% of the PGD in our study. This is similar with another South Indian study and studies from Bahrain and Morocco (4, 12, 23, 26). MCD shows variable geographic distribution. Some European studies and a south Indian study from Vellore have shown a decline in the relative frequency of MCD (7, 25, 27, 28). A study from china shows very low incidence of MCD (24). It is the most common cause of NS in children with 80% of histological verified cases occurring in first decade and a male: female (M: F) ratio of 2:1. (29). In this study, MCD comprised 20.47% of total PGD, peaked in the first decade of life and more common in males (M: F, 1.65:1).

FSGS shows increased prevalence from <10% to 25% of PGN in the past 20 years with variable geographic distribution (3, 4, 9, 21, 22, 23, 24). FSGS is the second most common PGD (18.35%) with a M:F ratio of 1.34:1, findings which are similar to south Indian studies from Vellore and Hyderabad (4, 5). Studies from Pakistan, Brazil and Arab countries have quoted FSGS as the commonest PGN (4, 10, 21, 25). A South Indian study from Bangalore differed from present study where FSGS is third most common PGD (12.6%)(30).

MN is thought to be the most common PGD in adults. A review of different articles shows MN to be the third or fourth common cause of PGD (6, 9, 11, 12, 22, 24). In our study it was the third most frequent PGN (16.22%) and most common cause of NS in adults which is similar to other south Indian studies. Present study also supports the same. However, a south Indian study from Bangalore differed from present study where MN is the second most common PGD (15.7%)(30). In many European Countries (Italy and Serbia), United Arab Emirates (UAE), and America MN is still the commonest cause of NS (5, 7, 27, 31).

IgA nephropathy represents 5.85% of total PGN, M: F (1.75:1) was uncommon in our study, a pattern similar to South Indian studies, including Pakistan and West Asian Studies. (4,12,21,25,32) However, IgAN is the commonest PGN in Europe, West Germany and some East Asian countries like Japan Korea and China (3, 7, 24, 33, 35, 36). Though IgAN is considered as the most common glomerular disease worldwide, its detection rate varies depending on indications of biopsy and mass screening programs for a symptomatic urinary abnormalities, genetic and environmental influences (3). In CRF patients the number of biopsies is increasing when normal sized kidneys with intact corticomedullary differentiation by ultra sonogram. Some of these patients are diagnosed as chronic IgAN.

The incidence of MPGN is decreasing in different parts of the world probably due to the improved socioeconomic conditions, improved hygienic environments, universal precautions and vaccinations which eventually cause a reduction in infection rates, and reduction in the regional endemic diseases (4, 10, 12, 28). In our study MPGN comprised 10.9% of all PGN, M:F (1.9:1) which is slightly higher compared to other South Indian studies conducted at Vellore (5.2%), Hyderabad (7.5%) and Bangalore (9.4%) (4, 25, 30). It is attributable to the higher prevalence of infectious diseases like bacterial infection, hepatitis B and C and parasitic infection.

In our study C1q nephropathy comprised (3.45% of PGN) with male predominance, M:F (2.25:1). Most of the studies did not mention this category. In this study increased incidence of C1q nephropathy can be explained by the improved IF study technique in each biopsy. IgMN & Fibrillary G.N was the least common entity in our study. Most of the studies did not mention IgMN as a distinct category. A study from Pakistan reported that IgMN comprises 2.9% cases of PGD (21). The existence of both entities (IgM nephropathy and C1q nephropathy) is disputed by some renal pathologists.

TIN is found to be a relatively less frequent BPRD in many studies across the world. Compared with two South Indian studies Hyderabad India (6.7%) Vellore, India (3.6%), this study shows a relatively high frequency of TIN 16.66% of total BPRD and second common cause of total BPRD (4, 22). Of total BPRD (n: 59), acute TIN (9.45%) is more common than chronic TIN. Similar to this study a South Indian study from Bangalore where TIN accounted for 20% of BPRD (30). This variation is mostly due to analgesic abuse and intake of native medication which comprises a mixture of plant products, heavy metals, other inorganic materials, is very popular in North Andhra Pradesh, India. We observed a higher incidence of ATN (2.4% of total BPRD) & cortical necrosis (1.92% of total BPRD) as compared to other studies which can be explained by aggressive performance of biopsy procedure in patients with ARF with prolonged recovery without an obvious etiology & non-recovering ARF in obstetric patients, insect bites and snake bites.

The most common SGD in this study was LN comprising 62% of all SGD which is comparable with that reported in

many studies across the world (3, 11, 21, 22, 24, 25). The second common SGD in our study was HUS/TTP (12.76% all SGD), with a female predominance M:F (0.57:1). This variation is mainly due to infections. The third common SGD in our study was DN (10.46%) with M: F (0.8:1) and it differs from other studies where it is second most common (4, 30). Compared with other studies this variation is mainly due to selection criteria for renal biopsy in these patients. The decreased incidence of diabetic nephropathy in this study may not be a true representative of the overall diabetic renal disease as only diabetic patients with unusual presentations were biopsied.

Multiple myeloma (MM 3.48%) and amyloidosis (2.32%) occupy fourth & fifth place among SGD. Studies from Pakistan and UAE & Italy have reported a higher frequency of amyloidosis (5, 7, 21). However, despite the higher prevalence of tuberculosis and other infectious diseases, amyloidosis comprised only 2.32% of SGD in our study. Instead of performing renal biopsy amyloidosis can be confirmed by biopsies from other sites such as rectum, gum or abdominal fat.

Limitation: Drawing accurate conclusions were difficult due to several biases regarding demographical, geographical and racial characteristics, differences in indications for renal biopsy, the analyzed clinical syndromes and variations in histopathological classification. Hence, accurate comparison with different data is difficult.

5. Conclusions

This study documented the incidence of BPRD in North Andhra Pradesh, India. The pattern of PGD largely corresponds to the distribution pattern of other South Indian studies. The increasing incidence of worldwide FSGS is confirmed in this study. Comparison with worldwide studies there is a wide variation of major histological patterns of renal disease across the world. However, the most common secondary glomerular disease has been documented as LN almost across the world. This study also provides descriptive epidemiological biopsy data of South Indian population and highlights the changing trends in this region. The changing incidence of BPRD is probably contributed by an increased referral & health awareness, together with improved biopsy technique. For comparison of BPRD from different parts of India it is necessary to maintain a national registry.

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