ORIGINAL RESEARCH

A Prospective Study of Nephritic and Nephrotic Syndrome Patients in A Tertiary Care Hospital

Dr. K. Chandrasekaran[1], Dr. V. Vijayram[2], Dr S. Yogasathya[3*]

[1]Assistant Professor, Department of Nephrology, Thanjavur Medical College, Thanjavur, India.
[2]Senior Resident, Department of Internal Medicine, Thanjavur Medical College, Thanjavur, India.
[*3]Assistant Professor, Department of Anaesthesia, Thanjavur Medical College, Thanjavur, India.

Corresponding Author
Dr. S.Yogasathya
Assistant Professor, Department of Anaesthesia, Thanjavur Medical College, Thanjavur, India
Email: yogachandru2018@gmail.com

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ABSTRACT

Background: Nephritic syndrome and Nephrotic syndrome are the major causes of morbidity in developing countries. Patients presenting with nephrotic syndrome / nephritic syndrome if not properly treated or even after appropriate treatment, may turn into chronic glomerulonephritis leading to end stage renal disease (ESRD). **Aims and Objectives**: To estimate the prevalence and the factors associated with nephrotic and nephritic syndromes and its types in patients admitted in the Nephrology Department of Government Thanjavur Medical College. **Methods:** This analytical prospective study was done among the patients diagnosed with Nephrotic or Nephritic syndromes admitted to the General Medicine and Nephrology Departments inpatient wards at Government Thanjavur Medical College and Hospital. The study was done from August 2022 to July 2023. Seventy participants were recruited based on inclusion and exclusion criteria. All the clinical, biochemical profile and biopsy data available were analysed. **Result:** Most patients are in the 21–30years of age group which indicates that nephrotic and nephritic syndrome patients are predominantly younger adults, with the highest incidence in their twenties. A significant portion of the patients (71.4%) had no comorbidities. Among those with comorbidities, systemic hypertension was the most common (22.9%), followed by type 2 diabetes mellitus (2.9%). Renal biopsy results showed a diverse range of pathologies, with minimal change disease (20%) and membranous nephropathy (18.5%) being the most prevalent. Other significant findings included MPGN (15.7%) and IgA nephropathy (14.3%). The mean SBP and DBP were significantly higher in nephritic syndrome patients than in nephrotic syndrome patients. Similarly, the mean serum creatinine and serum albumin were significantly higher in nephritic syndrome patients than in nephrotic syndrome patients indicating more severe renal impairment in nephritic syndrome. The severity of proteinuria was significantly greater in nephrotic syndrome patients, with higher proportions of 3+ and 4+ proteinuria. Haematuria was significantly more common in nephritic syndrome patients, with various forms (plenty of RBC, microscopic, and macroscopic). In contrast, nephrotic syndrome was associated with lower serum albumin and higher serum cholesterol. **Conclusion:** The prevalence of nephrotic syndrome is more prevalent in younger adults. Since nephritic syndrome is prevalent in age groups less than 20 years, it is recommended to monitor and screen for nephritic syndrome for patients presenting with symptoms.

Key words: Nephritic syndrome ,Nephrotic syndrome, End stage renal disease, Nephropathy.

INTRODUCTION

Nephrotic syndrome is a hallmark of glomerular disease and is characterised by proteinuria over 3.5 g/24 h, hypoalbuminemia, and variable amounts of hyperlipidaemia (hypertriglyceridemia and hypercholesterolemia), lipiduria, and oedema. Nephritic syndrome is a clinical syndrome characterised by haematuria, elevated blood pressure, decreased urine output and oedema. The worldwide incidence of renal disease diagnosed by kidney biopsy differs by region, race, age, sex and clinical practice pattern. Although glomerular disease ranks third among causes of chronic kidney disease following diabetic nephropathy and hypertensive nephrosclerosis, it is clinically important because it can be reversed and often cured when detected and treated at an early stage. Globally, the annual incidence of Nephrotic syndrome is approximately 3 cases per 100,000 in adults.

Nephritic syndrome is a major indicator of serious renal diseases necessitating kidney biopsies for histopathological evaluation. Treatment depends on the

underlying cause but usually involves managing the high blood pressure and reducing the inflammation in the kidneys. Establishing the cause of the disease is vital since aetiology is essential in the management of both nephrotic and nephritic syndromes. The data regarding this distribution of glomerular diseases and the factors associated with them are not available in the Indian setup. Hence a study is done to understand the distribution of nephrotic and nephritic syndromes and their influencing factors.

MATERIALS AND METHODS

Study Design: Analytical prospective study

Study Area

This study was conducted in the General Medicine and Nephrology Departments of Government Thanjavur Medical College & Hospital

Study Population

The study population consisted of patients diagnosed with Nephrotic or Nephritic syndromes admitted to the General Medicine and Nephrology Departments inpatient wards at Government Thanjavur Medical College and Hospital between 2022 and 2023.

Sample Size: 70

Inclusion Criteria

Patient Admitted with Nephrotic syndrome, Nephritic syndrome, Nephrotic range of Proteinuria and Sub-nephrotic Proteinuria

Exclusion Criteria

The patients who were not included in the study were as follows:

- Patients with age <12 years.
- Patients with Pre-existing renal diseases.
- Patients with Coagulopathy.
- Patient with known chronic kidney disease state

Sampling Procedure

Simple random sampling was employed

Data Collection

The study comprised of patients diagnosed with Nephrotic syndrome who were all admitted to the Medicine and Nephrology Ward. After applying appropriate inclusion and exclusion criteria, all data were collected from the information system of the hospital, including demographic, clinical, laboratory and treatment data. The available data generally included information about the age, Sex distribution, and Underlying Comorbidities. All the information was anonymous, with no patient identifiers.

Statistical Analysis: The obtained data was entered in MS Excel Windows 10. Statistical analysis was done with the help of SPSS 23. Continuous data with normal distribution was expressed as mean with standard deviation. Categorical data were expressed as frequency with %. Fisher's exact test was used to compare the frequency between the groups. An unpaired 't' test was used to compare the mean values between the two groups. Mann-Whitney U test was used to compare the median between the two groups. $P<0.05$ was considered statistically significant.

RESULT

Table 1: Age wise distribution of the Patients

Age category	n	%
≤20 years	12	17.1
21-30 years	21	30.0
31 -40 years	17	24.3
41-50 years	14	20.0
51 – 60 years	5	7.1
61-70 years	1	1.4
Gender	39	55.7
Female	31	44.3
Male		
Comorbidities		
Nil	50	71.4
Systemic Hypertension	16	22.9

Type 2 Diabetes Mellitus	2	2.9
Both SHTN/DM	2	2.9

The majority of the patients were in the age group of 21-30 years (30.0%) followed by 31 -40 years(24.3%).The majority of the patients were Females - 55.7 % ,Males - 44.3%.Among the comorbidities systemic hypertension is more common 16(22.9%).

Table 2: Distribution of the patients as per the Symptoms

S.No	Complaints	n	%
1	Frothy urine	31	44.3
2	Anasarca	29	41.4
3	Bilateral leg swelling	25	35.7
4	Oliguria	15	21.4
5	Facial puffiness	13	18.6
6	Hematuria	3	4.3
7	Headache	1	1.4

The most common symptoms were Frothy urine 44.3% followed by Anasarca 41.4%, Bilateral leg swelling 35.7%, Oliguria 21.4%, Facial puffiness 18.6%, Hematuria 4.3%.

Table 3. Description of proteinuria category of nephrotic and nephritic syndrome patients observed in the study (n=70).

S. No	Proteinuria	n	%
1	Nil	1	1.4
2	Trace	2	2.9
3	1+	1	1.4
4	2+	17	24.3
5	3+	27	38.6
6	4+	22	31.4

Table 4.Renal biopsy findings of patients (n=70)

S.No	Renal biopsy	n	%
1	Minimal change disease	14	20.0
2	Membranous Nephropathy	13	18.5
3	MPGN	11	15.7
4	IgA Nephropathy	10	14.3
5	FSGS	7	10.0
6	IRGN	5	7.1
7	Lupus nephritis class 4	5	7.1
8	Lupus nephritis class 5	2	2.9
9	Lupus nephritis class 3	2	2.9
10	IgA+FSGS	1	1.4

Table 5. Description of nephrotic and nephritic syndrome patients observed in the study

Variables	n	%
Syndrome	36	51.4
Nephritic syndrome	34	48.6
Nephrotic syndrome		
Renal biopsy in nephrotic syndrome		
Minimal change disease	14	41.2
Membranous Nephropathy	13	38.2

FSGS	7	20.6
Renal biopsy in nephritic syndrome		
IgA Nephropathy	11	30.5
MPGN	11	30.5
Lupus nephritis	9	25
IRGN	5	14

The most common Renal biopsy in nephrotic syndrome was Minimal change disease 41.2% followed by Membranous Nephropathy 38.2%, Focal segmental glomerulosclerosis (FSGS) 20.6%.The most common renal biopsy in nephritic syndrome was IgA Nephropathy & Membranoproliferative glomerulonephritis 30.5%, Lupus nephritis 25%.

Table 6. Description of various clinical and lab parameters observed in nephritic and nephrotic syndrome patients in the study (n=70)

S.No	Parameter	n	Mean	SD	Median	IQR	Min	Max
1	AGE(years)	70	33.09	12.69	31.5	23 - 42	14	65
2	SBP(mmHg)	70	134.71	16.66	130	120 - 150	110	180
3	DBP(mmHg)	70	82.71	11.28	90	70 - 90	70	100
4	Sr. Creatinine (mg/dL)	70	2.05	1.98	1.15	0.8 - 2.7	0.16	8.90
5	Sr. Albumin(g/dL)	70	2.73	0.38	2.75	2.5 - 2.975	2	3.8
6	Sr. Cholesterol (mg/dL)	70	230.39	29.32	230	214.25 - 246	153	310

Table 7. Comparison of proteinuria and hematuria category between nephritic and nephrotic syndrome

Proteinuria	Nephritic syndrome		Nephrotic syndrome		Fisher exact value	df	P Value
	n	%	n	%			
Nil (n=1)	0	0	1	100	21.1	5	<0.0001*
Trace (n=2)	1	50	1	50			
1+ (n=1)	1	100	0	0			
2+ (n=17)	15	88.2	2	11.8			
Hematuria							
Nil (n=35)	1	2.9	34	97.1	61.2	3	<0.0001*
Plenty of RBC (n=4)	4	100	0	0			
Microscopic (n=18)	18	100	0	0			
Macroscopic (n=13)	13	100	0	0			

DISCUSSION

Most patients are in the 21–30-year age group, followed by the 31–40-year age group (24.3%). This indicates that nephrotic and nephritic syndrome patients are predominantly younger adults, with the highest incidence in their twenties

The gender distribution reveals a higher prevalence of these syndromes in females (55.7%) than males (44.3%). This suggests a slightly higher susceptibility or detection rate of nephrotic and nephritic syndromes in female patients within the study population.

A significant portion of the patients (71.4%) had no comorbidities. Among those with comorbidities, systemic hypertension was the most common (22.9%), followed by type 2 diabetes mellitus (2.9%) and a combination of both (2.9%). This implies that while comorbid conditions are present, a substantial number of patients suffer from nephrotic and nephritic syndromes independently of other major health issues.

Renal biopsy results showed a diverse range of pathologies, with minimal change disease (20%) and membranous nephropathy (18.5%) being the most prevalent. Other significant findings included MPGN (15.7%) and IgA nephropathy (14.3%). These results suggest a variety of underlying causes for nephrotic and nephritic syndromes, emphasising the need for renal biopsy in diagnosis.

The age comparison between nephritic and nephrotic syndrome patients showed a significant difference (P=0.031). Patients aged ≤20 years were more likely to have nephritic syndrome, whereas those aged 41-50 years and 51-60 years were more likely to have nephrotic syndrome. This indicates an age-related difference in the prevalence of these syndromes.

Gender distribution did not significantly differ between nephritic and nephrotic syndromes (P=0.347), suggesting that gender does not substantially influence the syndrome type.

The mean SBP and DBP were significantly higher in nephritic syndrome patients than in nephrotic syndrome patients, with a P value less than 0.05. This suggests nephritic syndrome is associated with higher systolic and diastolic blood pressure.

Similarly, the mean serum creatinine higher patients than in nephrotic syndrome patients with a P value less than 0.05. This indicates more severe renal impairment in nephritic syndrome.

The severity of proteinuria was significantly greater in nephrotic syndrome patients, with higher proportions of 3+ and 4+ proteinuria compared to nephritic syndrome patients ($P<0.0001$). This is consistent with the typical presentation of nephrotic syndrome involving substantial proteinuria.

Haematuria was significantly more common in nephritic syndrome patients, with various forms (plenty of RBC, microscopic, and macroscopic) predominantly observed in this group ($P<0.0001$). This finding aligns with the characteristic presence of haematuria in nephritic syndrome.

Median values of age, SBP, DBP, serum creatinine, serum albumin, and serum cholesterol between nephritic and nephrotic syndromes were compared using the Mann-Whitney U test. Significant differences were observed for all parameters, with nephritic syndrome associated with younger age, higher blood pressure, and higher serum creatinine. In contrast, nephrotic syndrome was associated with lower serum albumin and higher serum cholesterol (all $P<0.05$). Similar findings were seen in previous studies by.

CONCLUSION

The prevalence of nephrotic syndrome is more prevalent in younger adults and female population. Since nephritic syndrome is prevalent in age groups less than 20 years, it is recommended to monitor and screen for nephritic syndrome for patients presenting with symptoms. The most common renal biopsy in nephrotic syndrome was Minimal change disease and in nephritic syndrome was IgA Nephropathy & Membranoproliferative glomerulonephritis. Similarly nephrotic syndrome screening could be useful in elderly age groups. Further studies recommended to substantiate the factors responsible for nephrotic and nephritic syndromes and their disease severity.

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Competing Interest

There is no competing interest

Authors Contribution

All authors in our study contributed to the data collection of the patients

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