Original Article

A clinical study of 50 cases of nephritic syndrome with special reference to serum lipid profile and altered renal functions

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Abstract

Nephrotic syndrome is a clinical complex characterized by a number of renal and extrarenal features, the most prominent of which are proteinuria, hypoalbuminuria edema and hyperlipidemia. It was recognised that primary glomerular lesions were responsible for majority of the cases of nephritic syndrome. Also results from a number of systemic diseases secondarily involving the kidneys can occur at any age starting from neonatal period (congenital nephrotic syndrome) to 8th or 9th decade. Aim of the study is to evaluate nephrotic syndrome patients clinically and biochemically in order to have a better understanding of the disease. Renal function is mildly decreased in nephrotic syndrome. Hyperlipidemia is a significant adverse component of nephrotic syndrome. Other consequences of nephrotic hyperlipidemia are increased platelet aggregation, increased susceptibility to infection and hyperlipidemia is a risk factor for progression of glomerular injury. Fifty cases of Nephrotic syndrome admitted to K.R. Hospital, Mysore, were studied priority given to changes in various lipid fractions and renal functions. Altered renal functions are seen in membranous, MPGN, FSGS and in case of SLE. Serum cholesterol was raised in FSGS, MPGN, membranous, and MCNS group. LDL and TG levels were raised in a few cases. HDL levels were within normal range except one case where it was high.

Keywords: Nephrotic syndrome (NS); Glomerular filtration rate (GFR); Focal and segmental glomerulosclerosis (FSGN); Mesangio-capillary glomerulonephritis (MCGN); Minimal change nephrotic syndrome (MCNS); Membranous proliferative glomerulonephritis (MPGN)

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INTRODUCTION

Nephrotic syndrome (NS) can occur at any age starting from neonatal period (Congenital NS) to eighth or ninth decade (associated with malignancy). Sex and race have no role in incidence of NS. But geography does to some extent playa role, Ex: Malaria causing NS in Africa, NS caused by filariasis in India. About 80% of Nephrotic children and 25% of adult patients have primary NS. Glomerulonephritis accounts for nearly 50% of NS in adults, but only 10-15% of childhood cases. Etiological and clinical correlation is present to certain extent even though there is some overlap. For the histological pattern involved, a specific type of clinical course is usually forth coming. Nephrotic syndrome is a clinical complex characterized by a number of renal and extrarenal features, the most prominent of which are proteinuria, hypoalbuminemia edema and hyper Iipidemia. The term 'nephrosis' was first introduced by Friedrich Muller in 1905. Suffix 'osis' means full-off. It was designated to a clinical picture characterized by edema, massive albuminuria, hypoalbuminemia with blood cholesterol increased, blood pressure being normal, susceptibility to infections and absence of renal failure. The term lipoid nephrosis came into vogue in 1913. Munk noting

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anisotropic fat in the urine of patients with syphilis called it lipoid nephrosis. Volhard and Fahr (1914) and Epstein (1926) accepted the view of Muller. Bell used special histological stains and demonstrated the thickening of basement membrane in cases of NS. In 1938 he introduced the term membranous glomerulonephritis to designate the thickening of glomerular basement membrane. Leiter in 1931 referred the clinical picture of massive edema, albuminuria, hypoproteinemia and hyperlipidemia in the absence of hypertension and azotemia as pure or genuine nephrotic syndrome. Later Leutcher (1955) and Allen (1955) differentiated the above pure form from mixed or complicated NS where hypertension and varying degree of azotemia were present. Berman and Scheiner defined NS as a clinical entity having multiple causes and characterized by increased glomerular permeability manifested by massive proteinuria, hypoalbuminemia, hyperlipemia, lipiduria and edema. In 1827 Richard Bright and Bostock noticed milky appearance of serum of edematous patients. With advancement in methods of biochemical analysis it was gradually demonstrated that this milky turbidity was caused by general increase in the lecithin content, cholesterol content and free fatty acids. Attention has recently been focussed on apoproteins. The lipids in both normal and nephrotic urine are bound at least in part to apolipoproteins and/or their catabolic derivatives. It was recognised that primary glomerular lesions were responsible for majority of the cases of NS. NS also results from a number of systemic diseases secondarily involving the kidneys. With recent developments like percutaneous renal biopsy for light, electron and fluorescence microscopy, further delineation of many forms of kidney disease that result in NS has become possible, pathogenesis better understood and for at least some of the lesions there is satisfactory therapy.

OBJECTIVES

Renal function is mildly decreased in NS but episodes of unstable renal function can also occur. This seems to be particular problem in the early phase of development of NS and occasionally leads to ARF requiring dialysis. Most reported cases are in adults. Hyperlipidemia is a significant adverse component of NS. Which may feature prominent lipid abnormalities even in the absence of a marked reduction in GFR. Other consequences of nephrotic hyperlipidemia are increased platelet aggregation, increased susceptibility to infection and hyperlipidemia is a risk factor for progression of glomerular injury. The present study in undertaken to evaluate a sample of NS patients clinically and biochemically in order to have a better understanding of the disease.

MATERIALS AND METHODS

The present study was conducted in the K.R. Hospital, Mysore Medical College, Mysore during the period September 2013 to February 2014.

Method of collection of data

Sample size - 50 cases Sampling procedure - Random sampling All the patients aged above 12 years who were clinically suspected to have nephrotic syndrome were included in the study and evaluated.

Inclusion Criteria

Adults who fulfilled the definition of nephrotic syndrome Fifty such cases who fulfilled the above criteria were included in the study. All the patients underwent a thorough clinical examination. A proforma containing all the relevant information including all the relevant information including any significant past, family and treatment history was filled up. This was followed by a detailed work up. Urine analysis including urine albumin, sugar, microscopy and 24 hr. protein and creatinine estimation were done. Only those patients who had nephrotic range proteinuria (≥ 3.5 gm/24 hrs) were included in the study .A detailed hematological workup including Hb% total count, differential count and ESR done. Fasting serum samples were obtained for determination of total cholesterol, triglycerides HDL and LDL. Simultaneous determinations of serum total protein, albumin, blood urea and Serum creatinine were also done. Chest X-ray/fluroscopy was done in all patients and all were subjected to ultrasound and abdomen. In those patients who were suspected to have lupus nephrits, ANA, ds DNA and LE cell phenomenon were done.

Procedure of renal biopsy

Patient was put in a prone position lower poles of the kidney were marked by ultrasound guidance. The area was sterilised with iodine and spirit. The skin, subcutaneous tissue were infiltrated with 2% lignocaine. Biopsy was done using a biopsy gun. Following the procedure patients were adviced 24 hr bed rest and pulse and blood pressure were mentioned regularly. Post procedure urine was collected to look for hematuria. After hospital discharge patients were asked to come for regular follow up.

OBSERVATIONS AND RESULTS

Table 1: Age and Sex distribution pattern of patients with NS

Age group (years)	Male	Female	Total	Percentage of patients
12 to 20	7	7	14	28
21 to 30	4	4	8	16
31 to 40	2	4	6	12
41 to 50	6	6	12	24
51 to 60	4	1	5	10
61 to 70	3	1	4	8
71 to 80	1	0	1	2

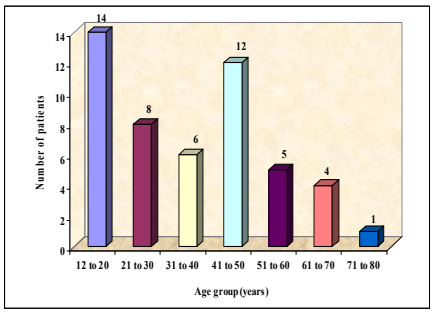

Figure 1: Age distribution

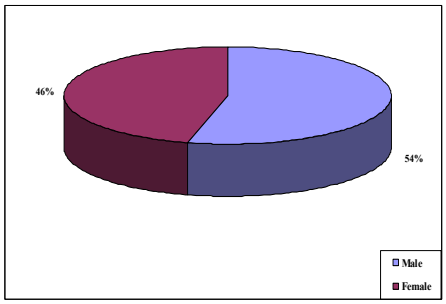

Figure 2: Sex distribution

Among the 50 patients 27 were males and 23 were females. Youngest patient was 13 year old and the oldest was 75 years old. Maximum number of patients (28%) were in the age group of 12-20 years followed by 12 (24%) in 41-50 years group and 8 in the 21-30 years group. 6 in the 31-40 years group. 5 in the 51-60 years group. 4 in the 61-70 years group and 1 in the 71-80 years group.

Table 2: Clinical manifestations - signs and symptoms seen in the present study

Signs and symptoms	Number of cases	Percentage
Edema	50	100
Ascitis	19	38
Hematuria	19	38
Hypertension	17	34
Pleural effusion	9	18
Oliguria	7	14
Breathlessness	4	8

Edema was the most common presentation and all patients had this symptom. 19 cases had ascitis and 9 cases had pleural effusion. Microscopic hematuria was present in19 patients and 17 patients had hypertension.

Table 3: Amount of proteinuria

Amount of proteinuria (gms/24hr)	No. of cases	Percentage
3 to 5	40	80
5 to 10	10	20
> 10	Nil	Nil

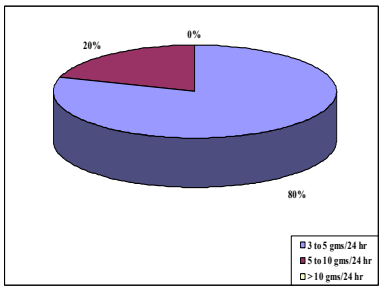

Figure 3: Amount of proteinuria

Majority of the cases had proteinuria in the range of 3-5 grams/24 hrs. 10 cases had the proteinuria in the range of 5-10 grams/24 hrs. Highest proteinuria of 9 grams/24 hrs was seen in a case of minimal change disease.

Table 4: Blood urea

Blood urea (mg%)	No. of cases	Percentage
20-50	33	66
51-100	16	32
> 100	1	2

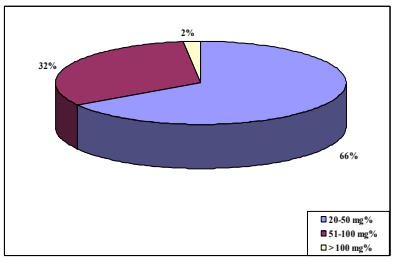

Figure 4: Blood urea

Normal blood urea was seen in 33 cases. 16 cases had raised blood urea. Highest blood urea was seen in a case of FSGS and it was 102 mg%.

Table 5: Serum creatinine

Serum creatinine (mg%)	No. of cases	Percentage
0.8 to 1.4	32	64
1.5 to 3.0	14	28
> 3.0	4	8

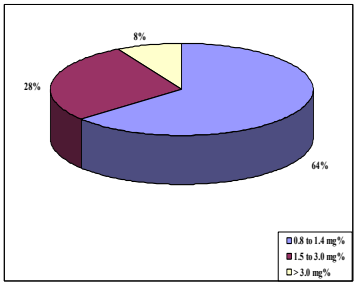

Figure 5: Serum creatinine

Thirty-two cases had normal serum creatinine. 14 patients

had raised serum creatinine in the range 1.5 to 3.0. 4 cases had a creatinine level more than 3 mg%.

Table 6: Serum cholesterol

Serum cholesterol (mg%)	No. of cases	Percentage
<200	26	52
201-300	21	42
301-400	2	4
401-500	1	2
> 500	0	0

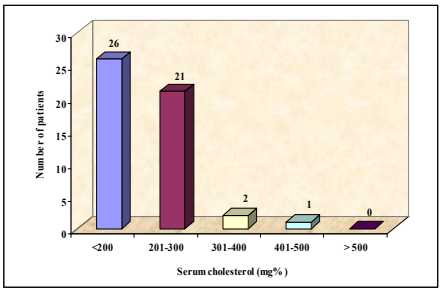

Figure 6: Serum cholesterol

Twenty-four cases had raised serum cholesterol and 26 cases had normal serum cholesterol levels.

Table 7: Serum LDL cholesterol

Serum LDL cholesterol (mg%)	No. of cases	Percentage
< 150	36	72
151-200	11	22
201-300	2	4
301-400	1	2
>400	0	0

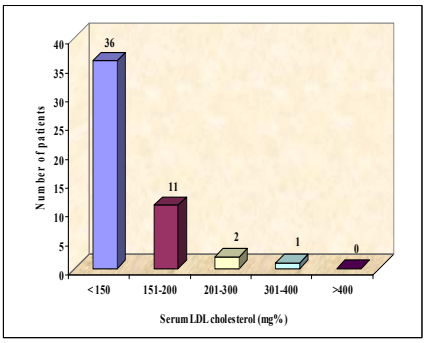

Figure 7: Serum LDL cholesterol

Thirty-six cases had normal LDL levels and 14 cases had raised LDL levels.

Table 8: Serum HDL cholesterol

Serum HDL cholesterol (mg%)	No. of cases	Percentage
< 30	0	0
30-63	49	98
>63	1	2

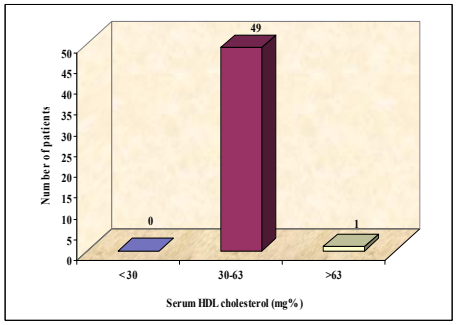

Figure 8: Serum HDL cholesterol

HDL cholesterol was within normal limits in 49 cases and one case had raised HDL level.

Table 9: Serum Triglycerides

Serum triglycerides (mg%)	No. of cases	Percentage
< 200	39	78
200-400	11	22
400-1000	0	0

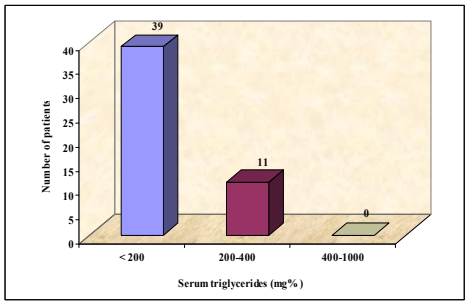

Figure 9: Serum Triglycerides

Serum triglycerides were normal in 39 patients and in 11 patients it was raised. Among the 50 cases of NS studied. Biopsy was done to establish the histopathological type in 41 cases. The remaining 9 cases were minimal change nephrotic syndrome (MCNS) and 9 cases were Diabetic Nephropathy (ON). Diabetic nephropathy was diagnosed on clinical grounds with supportive evidence of presence of normal or enlarged kidneys, proliferative diabetic retinopathy and bland urinary sediment with history of long standing diabetes mellitus.

Table 10: Frequency of different lesions seen in the present study

Histological lesions	No. of cases	Percentage
MCNS	20	40
Diabetic nephropathy	9	18
Membranous nephropathy	6	12
MPGN	6	12
FSGS	5	10
SLE	2	4
IgA nephropathy	**2**	**4**

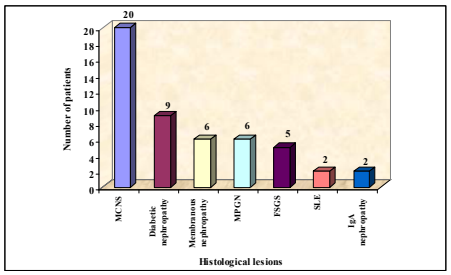

Figure 10: Frequency of different lesions seen in the present study

In the present study MCNS group constitutes 20 out of 50 cases i.e. 40%. Next frequent lesion was diabetic nephropathy seen in 9/50 cases - 18% membranous and MPGN were seen in 6 cases each - 12%. FSGS was seen in 5 cases. SLE and IgA nephropathy were seen in 2 cases each - 4%. Age and sex distribution, renal profile and lipid profile in each type of histological lesion of NS are as follows.

Minimal change nephrotic syndrome (MCNS)

Age and sex distributions

Sex	12-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
Male	5	1	0	1	2	0	1	10
Female	4	1	2	2	1	0	0	10
Total	9	2	2	3	3	0	1	20

Among 20 cases of minimal change nephrotic syndrome.10 were males and 10 were females. Maximum number of cases were in the group 12-20 i.e. 9 cases.

Renal Functions

Blood urea (mg%)	No. of cases	Percentage
20-50	19	95
51-100	1	5
>100	0	0
Serum creatinine (mg%)	No. of cases	Percentage
0.8-1.4	19	95
1.5-3.0	1	5
> 3.0	**0**	**0**

Renal functions were normal in 95% of cases and altered in 5% of cases.

Lipid Profile

Serum cholesterol (mg%)	No. of cases	Percentage
<200	10	50
201-300	8	40
301-400	1	5
401-500	1	5
Serum LDL (mg%)	No. of cases	Percentage
<150	13	65
151-200	6	30
201-300	-	-
301-400	1	5
HDL (mg%)	No. of cases	Percentage
Decreased <30	0	0
Normal 30-63	19	95
Increased >63	1	5
Serum TG (mg%)	No. of cases	Percentage
<200	16	80
200-400	4	20
400-1000	-	-

Serum cholesterol was raised in 50% of cases. LDL was raised in 35% cases and triglycerides were raised in 20% of cases.

Diabetic Nephropathy (ON)

Age and Sex distribution

Sex	12-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
Male	0	0	0	1	2	3	0	6
Female	0	0	0	2	0	1	0	3
Total	0	0	0	3	2	4	0	9

Among 9 cases of diabetic nephropathy 6 were males and 3 were females. 3 cases were in the age group of 41-50. 2 cases were in the age group of 51-60 and 4 cases in the age group of 61-70 years.

Renal functions

Blood urea (mg%)	No. of cases	Percentage
20-50	3	33.33
51-100	6	66.66
>100	0	0
Serum Creatinine (mg%)	No. of cases	Percentage
0.8-1.4	2	22.22
1.5-3.0	5	55.55
>3.0	**2**	**22.22**

Six cases had raised blood urea and 5 cases had raised creatinine in this group.

Lipid profile

Serum cholesterol (mg%)	No. of cases	Percentage
≤200	5	55.55
201-300	3	33.33
301-400	1	11.11
401-500	0	-
Serum LDL (mg%)	No. of cases	Percentage
≤150	6	66.66
151-200	2	22.22
201-300	1	11.11
301-400	0	0
HDL (mg%)	No. of cases	Percentage
<30	0	-
30-63	9	100
>63	0	-
Serum TG (mg%)	No. of cases	Percentage
<200	7	77.77
200-400	2	22.22
400-1000	0	-

Serum cholesterol was raised in 44% of cases, LDL was raised in 33% of cases and triglyceride was raised in 22% of cases.

Membranous nephropathy

Age and Sex Distribution								
Sex	12-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
Male	0	1	2	1	0	0	0	4
Female	0	0	1	1	0	0	0	2
Total	0	1	3	2	0	0	0	6

Among 6 cases of membranous nephropathy 4 were males and 2 were females. Maximum number of cases (3) were in the age group 31-40.

Renal functions		
Blood urea (mg%)	No. of cases	Percentage
20-50	3	50
51-100	3	50
>100	-	-
Serum Creatinine (mg%)	No. of cases	Percentage
0.8-1.4	3	50
1.5-3.0	3	50
>3.0	**-**	**-**

50% of cases had raised blood urea and serum creatinine and another 50% had normal blood urea and serum creatinine.

Lipid profile		
Serum cholesterol (mg%)	No. of cases	Percentage
< 200	3	50
201-300	3	50
301-400	-	-
401-500	-	-
Serum LOL (mg%)	No. of cases	Percentage
≤150	6	100
151-200	-	-
201-300	-	-
301-400	-	-
HOL (mg%)	No. of cases	Percentage
<30	-	-
30-63	6	100
>63	-	-
Serum TG (mg%)	No. of cases	Percentage
<200	6	100
200-400	-	-
400-1000	**-**	**-**

50% of cases had raised serum cholesterol. LOL, HOL and TG were within normal range.

Membrano proliferative glomerulonephritis (MPGN)

Age and Sex Distribution								
Sex	12-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
Male	1	0	0	2	0	1	0	3
Female	2	0	1	0	0	0	0	3
Total	3	0	1	2	0	0	0	6

Among 6 cases of MPGN 3 were males and 3 were females. 3 cases were in the age group 12-20 years. 2 cases were in the age group of 41-50 and 1 case in the age group 31-40.

Renal functions		
Blood urea (mg%)	No. of cases	Percentage
20-50	3	50
51-100	3	50
>100	0	-
Serum creatinine (mg%)	No. of cases	Percentage
0.8-1.4	3	50
1.5-3.0	3	50
>3.0	0	-

50% of cases had raised blood urea and serum creatinine.

Lipid profile		
Serum Cholesterol (mg%)	No. of cases	Percentage
≤200	3	50
201-300	3	50
301-400	0	-
401-500	0	-
Serum LDL (mg%)	No. of cases	Percentage
<150	4	66.66
151-200	2	33.33
201-300	-	-
301-400	-	-
HDL (mg%)	No. of cases	Percentage
<30	0	-
30-63	6	100
>63	0	-
Serum TG (mg%)	No. of cases	Percentage
<200	4	66.66
200-400	2	33.33
400-1000	**0**	**-**

Serum cholesterol were raised in 50% of cases. LDL was raised in 33% of cases and triglyceride in 33% of cases.

Focal segmental glomerulosclerosis (FSGS)

Age and Sex distribution								
Sex	12-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
Male	1	1	0	1	0	0	0	3
Female	1	0	0	1	0	0	0	2
Total	2	1	0	2	0	0	0	5

Among 5 cases of FSGS 3 were males and 2 were females. 2 cases each were in the age group 12-20 years and 51-60 years. 1 case was in the age group 21-30 years.

Renal function		
Blood urea (mg%)	No. of cases	Percentage
20-50	2	40
51-100	2	40
>100	1	20
Serum creatinine (mg%)	No. of cases	Percentage
0.8-1.4	2	40

1.5-3.0	2	40
>3.0	**1**	**20**

40% of cases had normal blood urea and serum creatinine. 60% of cases had raised blood urea and serum creatinine.

Lipid profile		
Serum cholesterol (mg%)	**No. of cases**	**Percentage**
≤ 200	1	20
201-300	4	80
301-400	0	-
401-500	0	-
Serum LDL (mg%)	No. of cases	Percentage
< 150	3	60
151-200	1	20
201-300	1	20
301-400	0	-
HDL (mg%)	No. of cases	Percentage
<30	1	-
30-63	5	100
>63	0	-
Serum TG (mg%)	No. of cases	Percentage
<200	3	60
200-400	2	40
400-1000	**0**	**-**

80% of cases had raised serum cholesterol. 40% of cases had raised serum LDL and 40% of cases raised serum triglyceride

SLE

Age and Sex Distribution								
Sex	**12-20**	**21-30**	**31-40**	**41-50**	**51-60**	**61-70**	**71-80**	**Total**
Male	0	0	0	0	0	0	0	0
Female	0	2	0	0	0	0	0	2
Total	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**

Two cases of NS showed SLE both were females in the age group 21-30 years.

Renal functions		
Blood urea (mg%)	**No. of cases**	**Percentage**
20-50	1	50
51-100	1	50
>100	0	-
Serum Creatinine (mg%)	No. of cases	Percentage
0.8-1.4	1	50
1.5-3.0	0	-
>3.0	1	50

Among two cases one had raised blood urea and creatinine levels and one had normal blood urea and serum creatinine levels.

Lipid profile SLE		
Serum cholesterol (mg%)	**No. of cases**	**Percentage**
≤ 200	2	100
201-300	0	-
301-400	0	-
401-500	0	-
Serum LDL (mg%)	No. of cases	Percentage
<150	2	100
151-200	0	-
201-300	0	-
301-400	0	-
HDL (mg%)	No. of cases	Percentage
<30	0	-
30-63	2	100
> 63	0	-
Serum TG (mg%)	No. of cases	Percentage
< 200	1	50
200-400	1	50
400-1000	0	-

Lipid profile is normal in one case and in the other triglyceride levels were raised.

IgA Nephropathy

Age and Sex distribution								
Sex	**12-20**	**21-30**	**31-40**	**41-50**	**51-60**	**61-70**	**71-80**	**Total**
Male	0	1	0	0	0	0	0	1
Female	0	1	0	0	0	0	0	1
Total	0	2	-	-	-	-	-	2

Among 2 cases of IgA nephropathy one was male and one was female. They were in the age group of 21-30 years.

Renal functions		
Blood urea (mg%)	**No. of cases**	**Percentage**
20-50	2	100
51-100	0	-
> 100	0	-
Serum creatinine (mg%)	No. of cases	Percentage
0.8-1.4	2	100
1.5-3.0	0	-
> 3.0	0	-

Both the cases had normal blood urea and serum creatinine levels.

Lipid profile		
Serum cholesterol (mg%)	**No. of cases**	**Percentage**
≤ 200	2	100
201-300	-	-
301-400	-	-
401-500	-	-
Serum LDL (mg%)	No. of cases	Percentage
< 150	2	100
151-200	0	-
201-300	0	-
301-400	0	-
HDL (mg%)	No. of cases	Percentage
< 30	0	-
30-63	2	100
< 63	0	-

Serum TG (mg%)	No. of cases	Percentage
< 200	2	100
200-400	-	-
400-1000	-	-

Lipid profile was normal in both the cases.

DISCUSSION

Study by JS Cameron *et al*, 1998 shows MCNS of 28%, MGN 25%, FSGS 15%, MCGN 12% and others 20%. Study by Brenner *et al*, shows MCNS of 15-20%, MGN 30-40%, FSGS 10-20%, MPGN 10% and MPGN 5-10%. Dr. M.K. Mani's study shows MCNS of 36%, Diabetic 18.5%, FSGS 9.4%, MGN 7%, MCGN 53%, SLE 3.8%, FPGN 2.6% amyloidosis 1.4%, IgA Nephropathy 1.2%, Chronic Proliferative GN 1.0%, MPGN 1.0%, Pregnancy related 0.5%, crescentic 0.1 %, undiagnosed 4% and miscellaneous 2%. Study by Chug and Sakhuja *et al*, North India, 1990 shows MCNS 24%, MGN 13%, MCGN 18%, FSGS 16% and others 29%. Compared between Western studies and Indian studies, incidence of MCNS is more in Indian studies. In the present study MCNS group constitutes 20 out of 50 cases i.e., 40%. Renal functions are usually normal in MCNS. May show slow decline in GFR and can occur in 10-30% of cases. Study done by Fujimoto *et al*, 1991 among 33 cases of MCNS studied 5 showed serum creatinine> 1.3 mg% i.e., 15% of cases. Study done by Bazzi *et al*, 1996 shows a serum creatinine of 0.90 ± 0.14 among the MCNS cases. In the present study the MCNS group serum creatinine is 1.11 ± 0.25. Study by Nolasco *et al*, from Guy's Hospital shows serum creatinine of > 1.5 mg% in 35% and serum creatinine of < 1.5 mg% in 65% of MCNS cases. In the present study among the MCNS cases 95% (19/20) had serum creatinine <1.5 mg% and 5% (1/20) had serum creatinine of > 1.5 mg% of renal function. 55.55% of cases had serum creatinine in the range 1.5-3.0 and 22.22% had serum creatinine> 3.0 gm% another 22.22% had serum creatinine of 0.8 to 1.4 mg%. 50% of membranous nephropathy and MPGN had serum creatinine in the range 1.5-3.0 mg% and another 50% had serum creatinine < 1.5mg%. 40% of FSGS cases had serum creatinine of < 1.5 mg% another 40% had serum creatinine in the range of 1.5 to 3.0 mg% and 20% had serum creatinine> 3.0 mg%. One had normal renal function and another had a serum creatinine > 3.0 mg%. The two IgA nephropathy of the present study had normal renal functions. In the present study, among the MCNS group 50% cases had raised serum cholesterol and 50% had normal serum cholesterol, 3.5% had raised LOL and 20% had raised TG level. Among ON group 44% had raised cholesterol, and 33% had raised LOL and 22% had raised TG. Among membranous nephropathy group, 50% had raised cholesterol LDL and TG being within normal range. Among MPGN group, 50% had raised cholesterol, 33% had raised LDL and 33% had raised TG. Among FSGS group, 80% had raised serum cholesterol 40% had raised LDL and 40% had raised TG.Among two SLE cases, one had raised TG, another had normal TG. Among two IgA cases lipid profile was normal. Variable, degrees of hyperlipidemia with different patterns of lipoprotein elevation has been reported in NS patients. Study done by Brown *et al*, shows serum cholesterol of 323±90,serum TG 173±86 LDL of 225 ± 84 and HDL of 56.84±18 in MCNS group. Present study showed. Serum cholesterol of 217.5 ± 60.75,serum TG of 163.25±70.83, LDL of 135.3 ± 56.61 and serum HDL of 46.9 ± 9.72 in MCNS group.

CONCLUSIONS

MCNS is the commonest cause of NS even in adults constituting 40%. Knowledge of renal histopathology is necessary as it helps in avoiding unnecessary medications with toxic drugs. Renal functions are not much altered in MCNS. Renal functions are affected in membranous nephropathy, MPGN and FSGS. Variable degrees of hyperlipidemia are seen in NS.

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