SUMMARY
AND
CONCLUSION
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The present study was conducted in the department of Paediatrics, M.L.B. Medical College, Hospital, Jhansi over a period of two years from August, 1991 to July, 1993.

The study was primarily aimed to evaluate the clinical profile of nephrotic syndrome along with biochemical, pathological and immunological changes that take place along with the disease process. A total of 65 cases of nephrotic syndrome were examined in the present study.

AGE, SEX AND SEASONAL INCIDENCE

Incidence of nephrotic syndrome, of total paediatric admission was observed to be 1.62%. Nephrotic syndrome comprised of 72.2% of children presenting with renal disease in duration of this study. Male : female ratio was 1.8 : 1. Highest incidence was observed in age group of 4-6 years (41.53%), nearly 2/3rd cases were between age group 1-5 years. In none of the child positive family history was elicited.

Maximum incidence was observed in between October-December (32.30%) followed by 29.23% in July-September. Two third cases were observed between July-December. So there was definite preponderance of cases in latter half of the year.
In present study group 23(35.39%) cases had suffered one or more episode while 42(64.61%) cases were having first episode of the illness.

**CLINICAL FEATURES**

Oedema was observed in 93.85% cases overall while in 100% patients with initial episode and 82.61% in cases with relapse.

Oliguria was present in 88.09% in cases with initial episode and 73.91% in patients with relapse. Gross hematuria was present in 6.15% of cases.

**RELEVANT PAST HISTORY**

URI was found in 14.29% cases with initial episode and 39.13% in cases with relapse.

History of allergic episode like rhinitis was present in 4.76% cases with initial episode while in 17.39% cases with relapse. Of the 23 cases (35.37%) who came in relapse 12(52.17%) cases had suffered one, 7(30.43%) cases had suffered two and 2(8.70%) cases each had suffered three or more than 3 previous episodes.

**IMPORTANT CLINICAL FINDINGS AND HISTOPATHOLOGICAL CORRELATION**

a. **Hypertension**

It was observed in 13(20%) cases of which 7 (53.85%) had minimal change glomerulonephritis, 3(23.08%) had membranoproliferative glomerulonephritis and 1(7.7%) each had focal segmental glomerulosclerosis and mesengial
proliferative and membranous nephropathy.

13.46% cases of MCNS, 25% cases of focal segmental glomerulosclerosis, 75% cases of membranoproliferative, 50% cases of membranous nephropathy and 33.33% cases of mesengial proliferative nephropathy had hypertension of various grades.

b. **Hematuria**

Of the total 14(21.54%) cases which had hematuria 6(42.86%) were having MCNS, 2(14.23%) were having FSGS, 4(28.5%) membranoproliferative and 1(7.15%) each had membranous and mesengial proliferative glomerulonephrosis.

Hematuria was observed in 11.53% cases of MCNS, 50% cases of FSGS, 100% cases of membranoproliferative glomerulonephritis, 50% cases of membranous nephropathy, and 33.33% cases of mesengial proliferative nephropathy.

c. **Azotemia**

Azotemia was observed in 10(15.38%) cases, of which 4(40%) had MCNS, 2(20%) cases each had FSGS and membranoproliferative and one (10%) case each had mesengial proliferative and membranous nephropathy. In MCNS group 7.69%, in FSGS and membranous proliferative and membranous group (50%) each and in mesengial proliferative nephropathy 33.33% cases had azotemia.

d. **UTI, Anemia, Hepatomegaly, Multisystem Disorders**

Of our study group, 15.38% cases had evidence of UTI, 73.84% had anemia of variable degrees and 43.07%
cases had evidence of hepatomegaly. None had evidence of any multisystem disorders.

e. **Ascites and Pleural effusion**

While 50.77% cases had evidence of ascites, only 3.08% cases had evidence of pleural effusion.

**BIOCHEMICAL CHANGES**

Blood urea levels were raised in 18.46%. Raised serum cholesterol levels (>200 mg%) were observed in 83.08% cases while low serum albumin levels (<2.5 gm%) were observed in 84.62% cases.

61(93.84%) cases had 24 hour proteinuria of massive degrees, >750 mg/kg/day.

**HISTOPATHOLOGICAL CHANGES**

Of total 65, 40(61.54%) cases had no evidence of hematuria, hypertension or azotemia and responded favourably to steroids and had age on lower side (<7 years) were labelled clinically as having typical minimal change lesion. Rest 25(38.46%) cases were selected for percutaneous renal biopsy. Out of these 12 cases (48%) still turned out to be having MCNS. Thus in all 52 cases (80%) were having nephrotic syndrome of minimal type, 4(6.15%) cases had membranoproliferative glomerulonephritis, 3(4.6%) cases had mesangial proliferative glomerulonephritis and 3(4.6%) cases turned out to be of membranous type. Mean age in MCNS lesion was 5.49±2.65 years while it was 6 years in FSGS, 9.25 years in membranoproliferative
group, 6.35% years in mesangial proliferative and 7.5 years in membranous nephropathy. Profile of hematuria, hypertension and azotemia has already been summarised.

**IMMUNOLOGICAL CHANGES**

Mean serum IgG levels were 853.38±276.53 mg/dl in nephrotic group as compared to 1777.50 mg% in controls. This lowering was statistically quite significant (p <0.001). Simultaneously mean serum IgM levels were raised in nephrotic group (p <0.05).

Initial hypocomplementemia was observed in 7.7% cases of MCNS and 2.5% in glomerulosclerosis and in all cases of membranoproliferative glomerulonephritis, 50% cases of membranous nephropathy. Persistant hypocomplementemia was observed mainly in membranoproliferative group only.

**DRUGS USED FOR REMISSION**

In 96.92% cases steroids (Prednisolone 2 mg/kg/day) was used to induce remission and in 31.75% of them for maintenance of remission.

Cyclophosphamide was used to induce remission in 12.31% cases and to maintain it in 12.5% of them.

**RESPONSE TO STEROIDS: CLINICAL CORRELATION**

On alternate day steroid regimen, it was observed that 61(96.82%) cases were initial responders, 2(3.17%) cases were early non responders and 4(6.35%) cases were late non responders. Overall 9.52% cases turned out to be
resistant. 6 cases (9.52%) were steroid dependent while 15 cases (24.60%) responded relatively slowly (after 2 weeks), 20% cases were frequent relapsers (8.2% of them dependent on steroids) and 50 cases (81.97%) cases were infrequent relapsers, while in age group of ≤ 6 years 22.72% cases were frequent relapsers, 2.27% were resistant while 6.82% were dependent to steroids. In age group ≥ 6 years, 14.28% cases each were frequent relapsers and resistant cases were 23.81%.

**STEROID RESPONSE AND UNDERLYING PATHOLOGIC LESION**

Of the 13 frequent relapsers, 10 were biopsied and 60% of them were of MCNS type, 20% each of FSGS and mesengial proliferative type.

Of 4 biopsied steroid dependent cases, 2 were having minimal change and one each had focal glomerular and membranous changes.

Of 6 biopsies non responders, 2(33.33%) were having minimal change nephrotic syndrome and 3(50%) were of membranoproliferative type while 1 case had membranous nephropathy.

**TIME TAKEN TO RESPONDE TO STEROIDS**

14 cases (22.95%) responded within 7 days of start of steroid in daily doses while majority of them 32 (52.45%) cases responded within 1-2 weeks of therapy in all approximately 75.40% cases responded within 15 days. Rest 24.60% cases were relatively slow responders. 11.47% cases responded between 2-3 weeks, 8.2% between 3-4 weeks,
3.28% between 4-6 weeks and only one 1.64% between 6-8 weeks.

RELAPSE FREE INTERVAL

On steroid therapy it was less than 2 months in 6.15% cases, 2-4 months in 7(10.77%) cases, 4-6 months in 18.46% cases, 6-12 months in 21.54% cases while 36.92% cases had relapse free interval of more than 1 and less than 2 years, only 6.15% cases had it more than 2 years.

ON CYCLOPHOSPHAMIDE THERAPY

Relapse free interval of 0-6 months and 6-12 months was observed to be in 25% cases and more than one year in 50% cases.

ASSOCIATION OF TUBERCULOSIS AND AND ITS EFFECT ON STEROID RESPONSE

Of our total study group 18.46% cases had evidence of primary complex. In relatively slow responders (72 weeks duration), 33.33% cases were having evidence of tuberculosis as against 8.70% cases in those responding quickly (<2 weeks duration).

RECOGNITION OF FREQUENT RELAPSERS

An attempt was made to evaluate markers for early recognition of frequent relapsers. Clinical presentation and histopathological changes provided no correlation.
It was seen that in cases having more than three relapses in first 6 months - 50% of them had 2 and 50% of them had 73 relapses in subsequent 6 months, while in group having no relapse in first 6 months, only 6.9% cases had 2 and 3.45% cases had 73 relapses in subsequent 6 months. So higher incidence of relapses in first 6 months correlated with occurrence of frequent relapses in subsequent 6 months.

By immunological studies it was seen that in cases those who relapse frequently serum IgG levels were very low 531.38±132.07 mg/dl as compared to 938.07±250.30 mg/dl in those who relapse in frequently (p \( \leq 0.001 \)). Concomitantly serum IgM levels were raised significantly (p \( \leq 0.05 \)) in frequent relapses as compared to infrequent relapsers.

It was also observed that in 49% cases of relapse evidence of upper respiratory tract infection and allergic rhinitis was present. In contrast to this such history was not elicitable in those who relapsed infrequently.