

Behavioral profile of children with nephrotic syndrome aged 5-18 years in a tertiary care center: An observational study

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Abstract

Background: Nephrotic syndrome is a common childhood renal disorder, runs a chronic course with frequent relapses and remissions exposing child to frequent infections, necessitates repeated diagnostic and therapeutic interventions, frequent hospitalisation can adversely affect emotional balance and behavioural adaption of children and also treatment with steroids for prolonged periods adding to psychosocial issues and behavioral problems.

Objectives: This study was done to analyze the behavioral profile of children with Nephrotic syndrome.

Materials and Methods: We assessed the prevalence of behavior abnormalities in 65 children with nephrotic syndrome diagnosed at least 1 year back compared with equal no of age sex matched control children using the questionnaire Developmental Psychopathology Checklist (DPCL) in a tertiary care center from 5-18 years. We also assessed the statistical association between socio demographic, disease and treatment related variables and behavior profile in the nephrotic syndrome children group.

Results: Behavior abnormalities in children with nephrotic syndrome were 67.7% significantly higher than that in the control group (35.4%). The statistically significant behavioral abnormalities were hyperkinesis, conduct disorders and learning disorders. Frequency of relapses, age of onset of NS, duration of illness, duration of steroids and residence had no significant effect on its occurrence.

Conclusion: Significant behavioral problems are observed in children with NS which needs assessment and treatment.

Keywords: Behavioral abnormalities, nephrotic syndrome, developmental psychopathology checklist (DPCL)

Introduction

Nephrotic syndrome is a common renal disorder. In developed countries its incidence is reported to be 20 to 40 per million population ^[1]. Whereas in the Indian subcontinent it is estimated at 90 to 100 per million population ^[2]. The Nephrotic syndrome runs a chronic course with frequent relapses and remissions exposing child to frequent infections. Being early age of onset with necessity of repeated diagnostic and therapeutic interventions, also frequent hospitalisation can adversely affect emotional balance and behavioural adaption of children as they are confronted with a variety of issues like separation from parents, restriction in activities, multiple and frequent absences from school also limit the time and opportunities for socialization with healthy peers and the social interaction of these children is further restricted by parents by presumed risk of developing infections and also dependency, pain and deformity. The patients with chronic disease may also show difficulty in adjustment, poor self-esteem and low confidence. All these may affect development of personality ^[3, 4]. Hence this study was undertaken to assess the behavioural profile in children with nephrotic syndrome.

The objectives of this study was to assess behavioral abnormalities in children with Nephrotic syndrome.

Methodology

This study was a prospective observational study conducted in a tertiary care hospital attached to a medical college in south India from November 2017 to May 2019. The study participants were the children attending the pediatric nephrology clinic as well as children admitted as inpatients.

The inclusion criteria were children, who were known cases of idiopathic nephrotic syndrome diagnosed at least 1 year back aged between 5-18 years. children with secondary nephrotic syndrome, other chronic illnesses, having prior neurological disease, persistent hypertension, which can affect the behavior of the children were excluded from the study. Children of the same age group attending pediatric OPD for minor illnesses were taken as controls.

The profile of each patient including age, gender, socioeconomic status were recorded. The SES determined using the Modified Kuppuswamy Scale. Each patient were clinically evaluated and DPCL was administered to control and cases, behavioural profile of the children were assessed. DPCL is a reliable and valid instrument for assessing psychopathology in Indian children in clinical settings. This tool was developed at the National Institute of Mental Health and Neurosciences, Bangalore by Kapur and colleagues in 1994. The DPCL is based on a dimensional rather than categorical approach. It identifies the following clusters of developmental problems/disorders: emotional disorders, hyperkinesis, childhood psychosis, learning disorder, hysterical syndrome, conduct disorder, autism, and obsessive compulsive neurosis.

Diagnosis corresponding to each cluster of DPCL were as follows-Emotional disorders (emotional disorders with onset specific to childhood), hyperkinesis (hyperkinetic disorders), childhood psychosis (schizophrenia, acute and transient psychotic disorders, other non-organic psychotic disorders), learning disorders (specific developmental disorders of scholastic skills), hysterical syndrome (dissociative/somatoform disorders), conduct disorder (conduct disorder) and obsessive compulsive neurosis (obsessive compulsive disorder).

The Excel and SPSS (SPSS Inc., Chicago v 18.5) software packages were used for data entry and analysis respectively. The results were averaged (mean \pm standard deviation) for each parameter for continuous data in Table and Figure. Proportions were compared using Chi-square test of significance Chi-Square (χ^2) test for (r x c tables).

Results

Among 65 children, most of them 38 children belonged to age group of 5-9 years accounting

for 58.5% and rest 27 belonged to age group of 10-18 years amounting 41.5%. Both groups were comparable statistically.

Table 1: Clinical profile of children among NS group

Parameter	Mean	SD	Median	Min.	Max.
Age in years	9.4	3.025	9	6	17
Age at onset of NS	3.03	1.838	3	1	8
Duration of illness (years)	6.3	3.656	6	1	15
Duration of steroids (weeks)	60.4	38.349	48	6	154
No of relapses	11.8	9.054	9	1	32

The minimum age being 6 years and maximum age was 17, mean age among cases group was 9.4 ± 3.02 years, The minimum age of onset of nephrotic syndrome was 1 year and maximum was 8 years mean age at onset was 3.03 ± 1.8 , the mean duration of illness being 6.3 ± 3.65 , further the mean duration of steroids being 60.4 ± 38.34 weeks and the mean number of relapses being 11.8 ± 9.054 .

Table 2: Distribution of Behavioral abnormality in NS group and control group

Behavioral abnormality	Cases (N=65)		Controls (N=65)		χ^2 value	P value
	n	%	N	%		
Hyperkinesia	21	32.3%	11	16.9%	6.885	0.009
Conduct disorders	22	33.8%	10	15.3%	9.231	0.002
Learning disorders	24	36.9%	9	13.8%	13.261	<0.001
Emotional disorders	14	21.5%	6	9.2%	3.782	0.052
Somatisation	4	6.2%	2	3.1%	0.699	0.403
Psychosis	1	1.5%	0	0	1.008	0.315
OCD	1	1.5%	0	0%	1.008	0.315
No abnormality	21	32.3%	42	64.6%	13.582	<0.001

Out of 65 children studied in each group, in nephrotic syndrome children group learning disorders i.e. 24 out of 65 (36.9%) were most common abnormality followed by conduct disorders (22) and hyperkinesia (21) found in 33.8% and 32% respectively. 14 children had emotional disorders (21.5%), 21 children didn't had any behavior abnormality in the nephrotic syndrome group. In control group hyperkinesia was the most common abnormality seen in 11 children (16.9%), followed by conduct disorders in 10 (15.3%), learning disorder in 9 (13.8%) and emotional disorder in 6 (9.2%) and 42 children (64.6%) didn't had any behavior abnormality. The chi square test applied, statistically significance was noted for hyperkinesia, conduct disorders, learning difference and no abnormality between cases and controls.

Among 65 children of nephrotic syndrome group, the incidence of behavioral abnormality was analyzed based on onset of 1st episode of nephrotic syndrome, 42 children had 1st episode before 3 years of age, among them 38% had hyperkinesia, followed by learning, conduct and emotional disorders in 33.3%, 30.6% and 16.7% respectively. 23 children were in >3 years group, learning disorders was most common abnormality amounting to 43.5% followed by conduct (39.1%), emotional disorders (30.4%) and hyperkinesia (21.4%), no abnormality was seen in 26.2% and 43.5% in < 3 years and > 3 years group respectively. However the differences was not statistically significant.

Among 65 nephrotic children enrolled, based on duration of illness incidence of behavioral abnormality was analyzed, in 1-3 year group conduct disorders (50%) was most common abnormality, followed by hyperkinesia (38.9%), learning disorders (33.3%), emotional disorders (11.1%) and summarization (5.6%), where as in 3-7 years group hyperkinesia and

emotional disorders amounting to 29.5% was most common abnormality followed by conduct and learning disorders in 23.3% children. In >7years group learning disorders was most common abnormality (46.7%) followed by hyperkinesia and conduct disorders in 30%, emotional disorders(23.3%), somatization (10%), OCD and psychosis in 3.3%. although the difference was statistically insignificant.

Among 65 nephrotic children enrolled, based on based on number of relapses incidence of behavioral abnormality was analyzed, in <10 relapses group learning disorders(38.2%) was most common abnormality, followed by conduct disorders(35.2%), hyperkinesia(29.4%), emotional disorders (17.6%) and somatisation (5.9%), where as in 10-20 relapses group emotional disorders amounting to 40% was most common abnormality followed by learning disorders (33.3%) hyperkinesia (26.6%) and conduct disorder (26.6%). In >20 relapses group hyperkinesia was most common abnormality (43.7%) followed by and conduct disorders in 37.5%, learning disorders (31.2%), emotional disorders (12.5%), somatization (12.5%), OCD and psychosis in 6.2%, no abnormality was seen in 44.1%, 13.3% and 25% respectively in <10, 10-20 and >20 relapses respectively, although the difference was statistically insignificant.

Among 65 nephrotic children enrolled, based on based on total duration of steroid intake incidence of behavioral abnormality was analyzed, in <50 weeks group learning disorders (35.2%) and conduct disorders (35.2%) was most common abnormality, followed by hyperkinesia (26.4%), emotional disorders (17.5%) and somatisation (5.9%), where as in 50-100 weeks group learning disorders amounting to 50% was most common abnormality followed by hyperkinesia (40%), conduct disorder (35%) and emotional disorders in 30% of children. In >100 weeks group hyperkinesia was most common abnormality (36.3%) followed by and conduct disorders in 27.2%, learning disorders (18.1%), emotional disorders (18.1%), somatization (18.1%), OCD and psychosis in 9%, no abnormality was seen in 44.1%, 10% and 36.3% respectively in <50, 50-100 and >100 weeks groups respectively, however no abnormality among 3 group had difference in incidence which was statistically significant.

Among 65 children among each group, no abnormality was seen in 32.3% cases and 64.2% among controls which was statistically significant, 1 behavioral abnormality of any type was seen in 24.4% in cases and 20% of controls, 2 behavioral abnormalities was seen in 23% of cases and 7.6% of controls which was statistically significant. 3 and 4 behavioral abnormalities seen in 16.3% and 3% among cases and 7.6% of controls had 3 behavioral abnormalities but statistically insignificant.

Discussion

The Nephrotic syndrome is a common childhood illness, its incidence is estimated to be 2-7 cases per 100000 per year and its cumulative prevalence rate is 16 per 100000 below age of 16 years worldwide. Prevalence of mental disorders among children has been reported to be 14-20% in various studies. According to World Health Report (2000), 20% of children and adolescents suffer from a disabling mental illness worldwide ^[5], however Indian studies reported prevalence rates of psychiatric disorders among children ranging from 2.6 to 35.6 percent ^[6].

In our study the behavioral abnormalities was found in 67.7% among cases which was similar to the study done by Pratham Guha *et al.* ^[7] who used DPCL scale for behavioral assessment, while other studies reported lesser incidence of behavioral abnormality between 35-40%. In our study we found that behavioral abnormality among controls was 35.4% slightly higher compared to other studies which reported from 8% to 22%. This difference could be because of the scale used to assess the behavior abnormality and majority were from lower socio economic status and ours was tertiary centre where we get more of prolonged duration of

illness and steroid dependent cases.

In our study there was increase in the behavioral abnormality in nephrotic syndrome children group compared to healthy children which was statistically significant for hyperkinesia, conduct disorders, learning disorders and no abnormality. In another study by Thakur *et al.* [8] reported significant abnormalities between cases and controls for all domains like aggressiveness, delinquency, anxiety/depression, somatic complaints. P.manti *et al.* [9] reported statistically significant increase in somatic complaints and also in other domains which was statistically insignificant. Fadiya Zyada *et al.* [10] reported definitive increase in behavior abnormality with statistically significant increase in hyperkinesia.

In our study we found learning disorder was the most common abnormality followed by conduct disorders, hyperkinesia, emotional disorders where as Pratham guha *et al.* reported hyperkinesia is the most common abnormality incidence being similar to our study, followed by OCD being common abnormality which was more compared to any other studies, pradipprava *et al.* [11] reported conduct disorders as the most common abnormality followed by emotional disorders as compared to our study the incidence was lesser. In another study by Emade ghobrial *et al.* [12] reported 80% conduct disorders and 55% hyperkinesia both were very high compared to all other studies.

Table 3: Comparison of various studies showing P value of behavioral abnormality among cases and controls

	Present Study	Thakur <i>et al.</i> [8]	Manti <i>et al.</i> [9]	Fadiya Zyada <i>et al.</i> [10]
Hyperkinesia	0.009	0.015	0.999	0.009
Conduct disorders	0.002	<0.0001	0.289	0.621
Learning disorders	<0.001	-		
Emotional disorders	0.052	<0.0001	0.330	0.027
Somatisation	0.403	0.0004	0.011	0.966
OCD	0.315	-	-	-
Psychosis	0.315	-	-	-
No abnormality	<0.001			

In our study we didn't find correlation between cumulative dose of steroids and behavioral abnormalities. The study done by Pratham Guha *et al.* and P Manti *et al.* also found similar results. In another study done by Mishra *et al.* found Behavioral problems were significantly correlated with the cumulative prednisolone dose, although in study by Prakash Chand Thakur *et al.* reported significant behavioral problems in steroid dependent nephrotic syndrome compared to IFRNS it was statistically insignificant. In another prospective longitudinal study by Aishwarya Uphadyaya *et al.* found alterations in conduct and hyperkinesia within 6 weeks of starting therapy in 25% of school going children. Youssef *et al.* [135] reported significant increases in anxiety, depression and aggression, which started to appear at week 1 and persisted at 3, 5 and 7 weeks compared with baseline. Symptoms were significantly correlated with prednisolone dose by week 7. In our study we also noted that good correlation between lesser cumulative dose of steroid and no behavior abnormality which was statistically significant (p value-0.03).

Conclusion

This study tried to analyze various types and also differentiating magnitude of behavioral problems found in children with NS. Furthermore, effects of various associated factors in its occurrence were studied. The behavioral abnormalities are common in children with nephrotic syndrome when compared to children without any chronic illness, behavior abnormalities were statistically significant with respect to hyperkinesia, conduct disorders and learning disorders.

In our study Behavior abnormalities were statistically significant with respect to conduct disorders, learning disorder among pre adolescents where as emotional disorders in adolescents compared to controls, while emotional disorders were statistically significant between pre adolescents and adolescents in NS group.

In our study there was no statistically significant abnormalities between age of onset of nephrotic syndrome, duration of illness, first episode of nephrotic syndrome and number of relapses and duration of steroid.

We can conclude that child with nephrotic syndrome should be screened for behavior abnormality routinely and in severe cases pediatric psychiatrist assessment and counseling may be required.

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