

Analysis of Factors Related to Emotional and Behavioral Abnormalities in Children with Primary Nocturnal Enuresis

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Introduction

Primary nocturnal enuresis(PNE) is common in clinic. Some of the children had difficulty in treatment, and then showed abnormal emotion and behavior, such as inferiority, worry, fear, fear of communicating with others, and affected the normal development of social psychology. In recent years, attention has been paid to the situation of emotional and behavioral disorders caused by PNE, but the research is mostly limited to the incidence and severity of emotional and behavioral abnormalities, and there are few studies on the possible causes or related factors. The purpose of this study is to investigate the related factors of emotional and behavioral abnormalities in children with primary nocturnal enuresis (PNE).

Methods and Materials

PNE children were collected from the enuresis clinic from January 2020 to December 2022. The inclusion criteria were as follows: (1) the age was 6 to 16 years old, and the involuntary urination during sleep was more than once a month and lasted for more than 3 months; (2) enuresis from childhood and no bed-wetting period for more than 6 months; (3) the family members of the patients signed the informed consent. Exclusion criteria: (1) urinary system related diseases or urinary anatomical malformations; (2) history of urinary surgery; (3) other diseases that may cause secondary enuresis, such as diabetes, diabetes insipidus, tethered cord syndrome and so on. The contents of the study included general data of PNE children, strengths and difficulties questionnaire (SDQ) and children's sleep questionnaire. According to the SDQ score, the patients were divided into two groups: abnormal score group (ASG) (≥ 20) and normal score group (NSG) (< 20). The differences of general data, SDQ scores and children's sleep quality between the two groups were analyzed.

Table 1. Comparison of the general data between ASG and NSG in children with primary nocturnal enuresis

	ASG (n=109)	NSG (n=142)	Total (n=251)	χ^2/Z	P
Gender				$\chi^2=4.575$	P=0.032
male	42 (38.5)	74 (52.1)	116 (46.2)		
female	67 (61.5)	68 (47.9)	135 (53.8)		
Age*				$\chi^2=4.736$	P=0.030
school-aged	64 (58.7)	102 (71.8)	166 (66.1)		
adolescence	45 (41.3)	40 (28.2)	85 (33.9)		
Place of residence				$\chi^2=0.771$	P=0.380
urban	60 (55.0)	86 (60.6)	146 (58.2)		
rural	49 (45.0)	56 (39.4)	105 (41.8)		
Child caregiver				$\chi^2=0.063$	P=0.802
parents	98 (89.9)	129 (90.8)	227 (90.4)		
grandparents	11 (10.1)	13 (9.2)	24 (9.6)		
Education of child caregivers				$\chi^2=6.510$	P=0.011
High level of education	23 (21.1)	51 (36.0)	74 (29.5)		
Low level of education	86 (78.9)	91 (64.0)	177 (70.5)		
Academic performance				$\chi^2=10.34$	P=0.006
good	32 (29.4)	65 (45.8)	97 (38.6)		
medium	51 (46.8)	61 (43.0)	112 (44.6)		
poor	26 (23.8)	16 (11.2)	42 (16.8)		
Constipation				$\chi^2=9.565$	P=0.002
yes	47 (43.1)	35 (24.6)	82 (32.7)		
no	62 (56.9)	107 (75.4)	169 (67.3)		
Family history				$\chi^2=8.822$	P=0.003
yes	29 (26.6)	17 (12.0)	46 (18.3)		
no	80 (73.4)	125 (88.0)	205 (81.7)		
Nocturia frequency				$\chi^2=11.37$	P=0.003
1 to 2 times a week	39 (35.8)	81 (57.0)	120 (47.8)		
3 to 6 times a week	54 (49.5)	49 (34.5)	103 (41.0)		
7 times a week	16 (14.7)	12 (8.5)	28 (11.2)		
Functional disorders of bladder				$\chi^2=5.611$	P=0.018
yes	73 (67.0)	74 (52.1)	147 (58.6)		
no	36 (33.0)	68 (47.9)	104 (41.4)		
Sleep score	5.0 (3.0,7.0)	3.0 (1.0,4.0)	3.0 (2.0,6.0)	Z=-5.168	P<0.001

Note *: age 6-12 is for school-aged, age 13-16 is for adolescence

Results

- The incidence of emotional and behavioral abnormalities in PNE children was 43.4% (109/251). The proportion of female and adolescents (13 – 16 years old) in the ASG were higher than those in the NSG ($P < 0.05$). There were statistical differences between the two groups in education level of caregivers, school performance and sleep disordered breathing scores ($P < 0.05$). The proportion of children with abnormal stool, family genetic history, severe enuresis and bladder dysfunction in the ASG were higher than those in the NSG ($P < 0.05$).
- The scores of emotional symptoms, conduct problems, hyperactivity symptoms and peer interaction in the ASG were higher than those in the NSG ($P < 0.05$).
- Multivariate regression analysis showed that gender, age, education level of caregivers, academic performance, abnormal stool, family history and total score of children's sleep scale were the influencing factor of emotional and behavioral abnormalities in PNE children ($P < 0.05$).

Discussion

- ① This study found that enuresis has a more significant effect on women's psychology, which may be due to the fact that women's psychology is more easily affected by external environment and interpersonal relationships;
- ② This study found that the low level of education of child caregivers is an important factor leading to abnormal mood and behavior of enuresis children. The reason may be that the level of education affects the caregivers' attitude towards enuresis and the behavior of educating children to a certain extent.
- ③ The results of this study show that the academic performance of children with ASG is worse than that of NSG, indicating that there is a strong correlation between children's academic performance and emotional and behavioral abnormalities.
- ④ The results of this study show that the positive rate of genetic history in children with ASG is relatively high, which may be due to the fact that the clinical symptoms of children with family genetic history are more serious, they are more likely to be complicated with other functional disorders, and the treatment will be more difficult.
- ⑤ The results of this study show that the incidence of abnormal stool and bladder dysfunction in children with ASG enuresis is higher, which may be due to the important role of bladder-gut-brain axis in triggering psychological problems.

Conclusions

The incidence of emotional and behavioral problems in children with enuresis is high. Puberty, girls, poor academic performance, low education level of caregivers, family genetic history, concomitant symptoms and abnormal stool are related factors of emotional and behavioral abnormalities in children with PNE.

Table 2. Comparison of the SDQ scores between ASG and NSG in children with primary nocturnal enuresis

	Emotional symptoms	Conduct symptoms	Hyperactivity symptoms	Peer communication	Social behavior	Difficulty score
ASG	4.0 (3.0,5.0)	2.0 (1.0,3.0)	5.0 (4.0,6.0)	3.0 (2.0,4.0)	8.0 (7.0,9.0)	22.0 (21.0, 23.0)
NSG	2.0 (1.0,3.0)	1.0 (1.0,2.0)	3.0 (2.0,4.0)	2.0 (1.0,3.0)	8.0 (7.0,9.0)	17.0 (16.0,18.0)
Z	Z=-7.525	Z=-4.477	Z=-8.111	Z=-5.542	Z=-1.252	Z=-13.479
P	P<0.001	P<0.001	P<0.001	P<0.001	P=0.211	P<0.001

Table 3. Logistic regression analysis of emotional and behavioral problems in children with primary nocturnal enuresis

	B value	SE	Wald value	Exp(B)	P
Constant	-2.132	1.131	3.555	0.119	P=0.059
Gender	-0.634	0.316	4.014	0.136	P=0.045
Age	0.127	0.058	4.734	1.136	P=0.030
Education of child caregivers	0.861	0.400	4.627	2.366	P=0.031
Academic performance	-0.230	0.465	7.011	0.292	P=0.008
Nocturia frequency	1.014	0.673	2.270	2.757	P=0.132
Constipation	0.838	0.400	4.394	2.313	P=0.036
Functional disorders of bladder	0.286	0.321	0.793	1.331	P=0.373
Family history	-1.688	0.509	11.014	0.185	P=0.001
Sleep score	0.313	0.066	22.654	1.368	P<0.001