

Comparison of Development Indicators, According to Ages and Stages Questionnaires in Children with Pollakiuria Compared to Healthy Children

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Abstract

Background: Children with pollakiuria have extraordinary daytime urinary frequency, which means urination every 15 to 20 minutes per day, without nocturnal enuresis, urinary incontinence, dysuria, and UTIs. This can be associated with developmental disorders. Therefore, this study aimed at evaluating the effect of Pollakiuria on developmental disorders.

Methods: A total of 224 individuals were included in this study. The age range was 5 to 7 years old and 70 patients with Pollakiuria were allocated to the case group and 154 healthy individuals were included in the control group. Height, weight, and Body Mass Index (BMI) were measured and were compatible with gender and age. The following information was also recorded, personal and social development, problem solving, fine motor, gross motor, communication, defining words, understanding of contradictory words, counting numbers, names of colors, copying forms of □ and △, and walking on toes, which were obtained by the ages and stages questionnaires (ASQ) and nelson development table.

Results: From a total of 224 children, factor expressing growth and development condition in the case group was significantly less than the control group ($P = 0.001$).

Conclusions: Development indicators, according to ages and stages questionnaires, in healthy children had a better status compared to children with Pollakiuria.

Keywords: Development Indicators, ASQ Questionnaire, Pollakiuria

1. Background

Bladder dysfunction, as a general term, describes abnormalities in either filling or emptying of the bladder (1-3). This condition, as a common problem in children, makes up more than 40% of pediatric urology clinic visits (4, 5). Children with Pollakiuria show extraordinary daytime urinary frequency, urination every 15 to 20 minutes per day without nocturnal enuresis, urinary incontinence, dysuria, and urinary tract infections (UTIs) (6).

This term is also used to define abnormally frequent small voids in a previously toilet trained child without evidence of polyuria or UTIs (7, 8).

In currently conducted surveys on young children, the most widely used parent completed questionnaires are ages and stages questionnaire (ASQ), which has high sensitivity and specificity for developmental delay detection (9-11). This approach has been used in non-standardized con-

ditions, such as developmental screens and pediatric waiting rooms, despite validation of standardized conditions (12, 13). To identify behavioral or developmental disabilities in children, screening tests for developmental conditions have been used for decades (14). Detection of growth retardation was based on unstandardized physician knowledge and individual informal screening tests. This non-standardized approach is generally unreliable. Use of clinical judgment alone by physicians detects less than 30% of developmental impairments in children (15, 16). Accordingly, this study aimed at evaluating development status in children with Pollakiuria based on the ASQ approach.

2. Methods

2.1. Study Setting

This research, as a hospital-based case-control study was conducted at a pediatric clinic of Amirkabir hospital.

2.2. Study Population

A representative sample was taken from male and female students, aged 5 to 7 years of age with Pollakiuria. From a total of 224 children, 70 were selected as the case group and 154 as the control group.

2.3. Measurements

Study population in both groups with respect to demographic and socio-economic issues were at the same level. Height, weight, and BMI were measured. Also development of personal and social conditions, problem solving, fine motor, gross motor, communication, defining words, understanding contradictory words, counting numbers, knowing the names of colors, copying forms of □ and △, and walking on toes were assessed by the ages and stages questionnaires (ASQ) and nelson development table.

2.4. Ethical Considerations

Ethical issues (including plagiarism, data fabrication, and double publication) were observed by the authors. In addition, the ethical committee of Arak University of Medical Sciences approved the study protocol.

2.5. Statistical Analysis

Data analysis was conducted by chi-square and t test using the SPSS program and significance level of $P < 0.05$.

2.6. Inclusion and Exclusion Criteria

All children aged 5 to 7 years with Pollakiuria diagnosis were included in the study, yet children with systemic diseases, mental, and any other disorders that effect child development, as well as those with parents that did not provide their consent, were excluded.

3. Results

In total, 109 participants were male and 115 were female. Seventy patients with Pollakiuria were allocated to the case group (36 males (51.4%) and 34 females (48.6%)) and 154 healthy children were assigned to the control group (73 males (47.4%) and 81 females (52.6%)), which shows a non-significant difference and homogeneity of the 2 groups ($P = 0.6$).

Personal-social index was positive in 47.1% of case and 87% of controls. Problem solving was positive in 52.9% of cases and 83.1% of controls. Fine motor was positive in 47.1% of cases and 64.7% of controls. Gross motor was positive in 55.7% of case and 88.3% of controls. Communication was positive in 48.6% of cases and 87% of controls. Knowing the name of colors was positive in 44.3% of cases and 6.5% of controls. Ability to wear clothes was positive in 58.6%

of cases and 11% of controls. Understanding the meaning of words was positive in 54.3% of cases and 13.6% of controls. Use of complex words was positive in 44.3% of cases and 19.5% of controls. Definition of words was positive in 55.7% of cases and 2.6% of controls. Understanding opposite words was positive in 61.4% of cases and 2.6% of controls. Number Counting was positive in 51.4% of cases and 6.5% of controls. Whole man drags was positive in 44.3% of cases and 18.8% of controls. Copying □ was positive in 61.4% of cases and 11.7% of controls. Copying △ was positive in 52.9% of cases and 23.4% of controls. Walk on toes was positive in 57.1% of cases and 1.9% of controls. Capers was positive in 52.9% of cases and 1.9% of controls. Regarding father's education, 11.4% of cases and 23.4% of controls had fathers with a diploma degree, and 57.2% of cases and 52.6% of controls had fathers with higher than diploma degree. In addition, regarding mother's education, 30% of cases and 20.1% of controls had a diploma degree, and 18.6% of cases and 50.2% of controls had mothers higher than a diploma degree. There was a statistically significant difference between the 2 groups ($P = 0.001$) (Table 1).

4. Discussion

Pollakiuria, known as extraordinary daytime urinary frequency, has many psychiatric and developmental complications. The results showed lower growth and development status in children with Pollakiuria. The first description of Pollakiuria was provided by Asnes and Mones in 1973 using radiological studies (17). Stephens and colleagues reported on the same disease as dummy syndrome and identified psychological factors as the principal cause of this disorder (18). Basar and colleagues in a study showed that 30% of children with tethered spinal cord had Pollakiuria (19). Male dominance in Pollakiuria was seen in some studies leading to externalization of male genitalia (20-22), however, in the current study, there was an equal number of boys and girls. In some studies, certain medications, such as milnacipran and fluoxetine, may result in Pollakiuria (23, 24). Nevertheless, the patients in this study were not exposed to these medications. In a series by Chan and colleagues, spontaneous resolution of Pollakiuria in all 48, 3.9- to 7.8-year-old, patients had occurred, within 12 days to 5 months after diagnosis (25); this has also been reported by other studies (26-28). Wang and colleagues conducted a study to evaluate Pollakiuria in Tic Disorders (TD), they concluded that TD occurs in children with Pollakiuria, yet it is not frequently encountered (17). Also, in a study by Vilijakainen and colleagues, they observed that vitamin D could improve the growth and development status of children (29). In addition, Robert and colleagues conducted

another study on the correlation of socioeconomic and development status in children; in this study, they observed that family characteristics, children's own characteristics, and external support systems could effect developmental status (30). The limitation of this study was the small size of patients in the 2 groups and lack of cooperation by certain patients and their parents. However, according to these reasons, further studies, especially prospective researches with greater sample size will be needed in the future to evaluate the correlation of Pollakiuria with growth and developmental disorders.

4.1. Conclusions

Development indicators in healthy children, according to ages and stages questionnaires, have better status compared to children with Pollakiuria. Based on this, growth and developmental disorders could be reduced by treatment of Pollakiuria in children.

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Footnote

Conflicts of Interest: The authors declare no competing interests.

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Table 1. Age and Development Indicators of Primary Mono-symptomatic Nocturnal Enuresis Cases (n = 53) and Controls (n = 57)^a

Variables	Case Group	Control Group	P Value ^b
Gender			0.6
Male	36 (51.4)	73 (47.4)	
Female	34 (48.6)	81 (52.6)	
Person - Social Index			0.001
<31.5 (-)	37 (52.9)	20 (13.0)	
>31.5 (+)	33 (47.1)	134 (87)	
Problem Solving			0.001
<30.5 (-)	33 (47.1)	26 (16.9)	
>30.5 (+)	37 (52.9)	128 (83.1)	
Fine Motor			0.001
<30.5 (-)	37 (52.9)	42 (27.3)	
>30.5 (+)	33 (47.1)	145 (64.7)	
Gross Motor			0.001
<32.7 (-)	31 (44.3)	18 (11.7)	
>32.7 (+)	39 (55.7)	136 (88.3)	
Communication			0.001
< 31.7 (-)	36 (51.4)	20 (13)	
> 31.7 (+)	34 (48.6)	134 (87)	
Knowing Name of Colors			0.001
Yes	39 (55.7)	144 (93.5)	
No	31 (44.3)	10 (6.5)	
Wearing one's own clothes			0.001
Yes	29 (41.4)	137 (89.0)	
No	41 (58.6)	17 (11)	
Understanding of words			0.001
Complete	32 (45.7)	133 (86.4)	
Incomplete	38 (54.3)	21 (13.6)	
Use of Complex Words			0.001
Complete	39 (55.7)	124 (80.5)	
Incomplete	31 (44.3)	30 (19.5)	
Words Definition			0.001
Complete	31 (44.3)	150 (97.4)	
Incomplete	39 (55.7)	4 (2.6)	
Understanding Opposite Words			0.001
Complete	27 (38.6)	150 (97.4)	
Incomplete	43 (61.4)	4 (2.6)	
Counting Numbers			0.001
Yes	34 (48.6)	144 (93.5)	
No	36 (51.4)	10 (6.5)	

Whole Man Drag			0.001
Yes	39 (55.7)	125 (81.2)	
No	31 (44.3)	29 (18.8)	
Copy □			0.001
Yes	27 (38.6)	136 (88.3)	
No	43 (61.4)	18 (11.7)	
Copy △			0.001
Yes	33 (47.1)	118 (76.6)	
No	37 (52.9)	36 (23.4)	
Walk on Toes			0.001
Yes	30 (42.9)	151 (98.1)	
No	40 (57.1)	3 (1.9)	
Caper			0.001
Yes	33 (47.1)	151 (98.1)	
No	37 (52.9)	3 (1.9)	
Father's Education			0.001
Under Diploma	8 (11.4)	36 (23.4)	
Diploma	22 (31.4)	37 (24.0)	
Associate	22 (31.4)	26 (16.9)	
Bachelor	18 (25.8)	55 (35.7)	
Mother's Education			0.001
Under Diploma	21 (30.0)	31 (20.1)	
Diploma	36 (51.4)	43 (27.9)	
Associate	11 (15.7)	31 (20.2)	
Bachelor	2 (2.9)	49 (31.8)	
Economical Status, Million IRR			0.001
< 1	0	64 (41.6)	
> 1	70 (100.0)	90 (58.4)	
BMI			0.001
< 0	4 (5.7)	1 (0.6)	
5 - 10	23 (32.9)	21 (13.6)	
10 - 25	19 (27.1)	14 (9.1)	
25 - 50	11 (15.7)	25 (16.2)	
50 - 75	9 (12.9)	41 (26.6)	
75 - 85	3 (4.3)	25 (16.2)	
85 - 90	1 (1.4)	22 (14.3)	
90 - 90	0	5 (3.2)	
Weight Percentile			0.001
< 3	10 (14.3)	0	
3 - 15	30 (42.5)	3 (1.9)	
15 - 50	21 (30.0)	60 (39.0)	
50 - 85	8 (11.4)	72 (46.8)	
85 - 97	1 (1.4)	19 (12.3)	

Height Percentile		0.001
< 3	10 (14.3)	0
3 - 15	34 (48.6)	12 (7.8)
15 - 50	17 (24.3)	66 (42.9)
50 - 85	9 (12.9)	48 (31.2)
85 - 97	0	28 (18.2)
Family Status		0.3
Presence of Parents	63 (90)	144 (93.5)
Father Only	5 (7.1)	7 (4.6)
Mother Only	2 (2.9)	3 (1.9)

Abbreviations: +, as inappropriate; -, as appropriate.

^aThe values are presented as No. (%).

^bP values < 0.5 were considered statistically significant.