

INVESTIGATION OF LOWER URINARY SYSTEM SYMPTOMS IN CHILDREN WITH CEREBRAL PALSY ACCORDING TO GROSS MOTOR FUNCTION CLASSIFICATION SYSTEM



Betül Ünal¹, Pelin Pişirici², Aygül Köseoğlu Kurt¹, Halil Tuğtepe³

¹Bahcesehir University, Graduate Education Institute, Physiotherapy and Rehabilitation Department, Istanbul, Türkiye

²Bahcesehir University, Health Science Faculty, Physiotherapy and Rehabilitation Department, Istanbul, Turkey

³Private Tugtepe Pediatric Urology Center, Division of Bladder and Bowel Dysfunction, İstanbul, Turkey



Introduction

Neurological defects in children with cerebral palsy (CP) not only affect their motor skills but also lead to bladder and bowel problems. Although most children with CP have achieved urinary control, more than 50% of cases experience lower urinary tract symptoms (LUTS), leading them to seek medical attention at pediatric urology clinics due to urinary dysfunction. Common LUTS complaints observed in CP include delayed toilet training, urinary incontinence, increased frequency of urination, urgency, urinary hesitancy, and recurrent urinary tract infections. The symptoms seriously reduce the quality of life of children. LUTS is among the most common reasons for hospitalization in adulthood for individuals with CP. Therefore, it is extremely important to detect LUTS in CP at an early age, to create appropriate treatment programs and to protect the upper urinary systems.

The aim of this study is to determine the severity of LUTS, which is common in children with CP; It is examined according to quality of life, toilet training age, CP type and gross motor functional classification system (GMFCS).

Methods

54 (29 girls; 25 boys) children with CP were included in the study.

Evaluations

- Urinary symptoms of the children included in the study evaluated with the **Voiding Disorders Symptom Score (DVISS)**,
- Quality of life of the children included in the study evaluated with **the Pediatric Incontinence Quality of Life Scale (PINQ)**.
- Evaluated from **bladder diary data (bladder usage capacity, frequency of voiding)**
- It was examined how children's urinary symptoms, quality of life and toilet training age differ according to the type of CP and GMFCS.
- **Inclusion Criteria;** 5-18 years old diagnosed with cerebral palsy lower urinary tract complaints and symptoms Children in levels I-II-III or IV according to the GMFCS were included in the study.
- **Exclusion criteria;** At level V according to the GMFCS, epileptic seizures, cognitively impaired, children with anatomical or congenital malformations of the urinary system were not included in the study.

Results

According to the CP type results were as follows;

- The IBSS scores for hemiplegic (HP), diplegic (DP), quadriplegic (QP) and ataxic (AT) CP were as follows, respectively: (HP:13, DP:15,32, QP:16, AT:13,17), **p=0,145**
- The PINQ scores for hemiplegic (HP), diplegic (DP), quadriplegic (QP) and ataxic (AT) CP were as follows, respectively: (HP: 30,62, DP: 32,03, QP: 33,5, AT: 29,17), **p=0,462**
- The toilet training age for hemiplegic (HP), diplegic(DP), quadriplegic (QP) and ataxic (AT) CP were as follows, respectively: (HP: 4,12, DP: 5,21, QP:9,25,5, AT: 5,17), **p=0,001**

Type of CP	DVISS	PINQ	Bladder Capacity	Toilet Training age	Voiding Frequency
Hemiplegic	13	30,62	%61	4,12	7,92
Diplegic	15,32	32,03	%61	5,21	7,58
Quadriplegic	16	33,5	%58	9,25	6,75
Ataxic	13.17	29,17	%60	5,17	7
p value	0,145	0,462	0,961	0,001	0,220

According to the GMFCS level results were as follows;

- The IBSS scores for according to GMFCS level I-II-III-IV were as follows, respectively; (Level-I: 13,63, Level-II:16,5, Level-III: 14,77, Level-IV: 18,2), **p=0,075**
- The PIN-Q scores for according to GMFCS level I-II-III-IV were as follows, respectively; (Level-I: 31,38, Level-II:31,5, Level-III: 30,62, Level-IV: 34,4), **p=0,677**
- The toilet training age for according to GMFCS level I-II-III IV were as follows, respectively; (Level-I: 4,73, Level-II:5,46, Level-III: 5,63, Level V: 7,46), **p=0,002**

GMFCS Levels	DVISS	PINQ	Bladder Capacity	Toilet Training Age	Voiding Frequency
Level I (n=32)	13,63	31,38	%62	4,73	7,69
Level II (n=4)	16,5	31,5	%58	5,46	7,25
Level III (n=13)	14,77	30,62	%60	5,63	7,27
Level IV (n=5)	18,2	34,4	%57	7,46	7,5
P value	0,075	0,677	0,588	0,002	0,428

Conclusions

In our study, consistent with the literature, toilet training age was found to be statistically significant only in the level IV and quadriplegic groups. As the GMFCS level increases, the age of toilet training is delayed. Since voluntary urination is an action that requires mobilization and cognitive control together, we recommend that the GMFCS V group should not be included or evaluated separately when evaluating LUTS in children with CP.

References

1. Yıldız, N., Akkoç, Y., Ersöz, M., Gündüz, B., Erhan, B., Yesil, H., . . . Alkan, H. (2017). Cross-sectional study of urinary problems in adults with cerebral palsy: awareness and impact on the quality of life. Neurological sciences : official journal of the Italian Neurological Society and of the Italian Society of Clinical Neurophysiology, s. 38(7), 1193–1203 2. Bross, S., Honeck, P., Kwon, S. T., Badawi, J. K., Trojan, L., & Alken, P. (2007). Correlation between motor function and lower urinary tract dysfunction in patients with infantile cerebral palsy. Neurourology and urodynamics, s. 26(2), 222–227. 3. Roijen, L. E., Postema, K., Limbeek, V. J., & Kuppevelt, V. H. (2001). Development of bladder control in children and adolescents with cerebral palsy. Developmental medicine and child neurology, s. 43(2), 103–107