

A Cross Sectional Study on The Incidence of Urinary Tract Infections in Children with Cerebral Palsy

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ABSTRACT

Objective: To determine frequency of urinary tract infections (UTI) in children with cerebral palsy.

Materials and Methods: The design of this study was cross sectional study. This study was carried out at Aziz Bhatti Shaheed Hospital Gujrat and the duration of this study was from June 2020 to December 2020. 115 patients fulfilling the inclusion criteria were taken from the Pediatric department of Aziz Bhatti Shaheed Hospital Gujrat. After taking a consent from the parents or attendants their basic demographic information like name, age and sex was obtained. For final diagnosis of UTI (as per operational definition) urine sample for complete urinalysis and culture/ sensitivity was taken in aseptic measures and then was sent to hospital laboratory. All data was collected by me on Performa (attached). All collected data was entered in SPSS version 20 and was analyzed by same software.

Results: The mean age of patients was 8±3.7 years with minimum and maximum age of 2 and 14 years. There were 76(66.09%) male and 39(33.91%) female cases with male to female ratio of 1.94:1. According to operational definition frequency of UTI was seen in 68(59.13%) of the cases.

Conclusion: Hence, our study found higher frequency of UTI in children with cerebral palsy. This problem may get worse with restricted mobility. Therefore, special efforts should be made for improving quality of life of patients by physiotherapy and effective treatment.

Keywords: Physiotherapy, Dyskinetic And Ataxic, Urinary Tract, Musculoskeletal

INTRODUCTION

Cerebral palsy (CP) is the most common physical disability of childhood that describes a group of disorders of movement and posture that are also often accompanied by associated impairments and secondary musculoskeletal problems. CP is classified based on predominant neurological symptoms, and is divided into spastic, dyskinetic and ataxic types. Spastic CP accounts for 80% of all CP cases and is divided according to the distribution of symptoms, into hemiplegia, diplegia and tetraplegia. The prevalence of CP is approximately 2 in 1000 live births. The causes of CP are complex and largely unknown. Several predisposing factors and causal pathways have been suggested. Most common are Preterm births, intrauterine growth restriction, perinatal infections, and multiparity, present the largest risks for a cerebral palsy outcome. There are various complications associated with children having cerebral palsy, in which the most common are epilepsy, symptomatic neurogenic bladder (SNB), pneumonia, malabsorption and gastrointestinal (GI) problems along with dehydration, psychiatric problems and urinary tract infection (UTI). Being focused on UTI in CP children I have found only one such study that has reported UTI in 20 (38.5%) CP children.

The rationale of my study is to determine frequency of UTI in CP children of our population as no local study is available and international data is quite deficient in this regard. I found only one study in literature which was done in Nigeria, showing higher frequency of UTI in CP child. Generally, we overlook such important complication in these children and this study will help me to find frequency of UTI in CP children in our population. This study will also help me to update our routine diagnosis and hence treatment plans for such patients as this neglected

complication may lead to another severe health related issues in these children that is acute and chronic renal failure.

MATERIALS AND METHODS

This study was carried out at Aziz Bhatti Shaheed Hospital Gujrat and the duration of this study was from June 2020 to December 2020. A total of 115 patients fulfilling the inclusion criteria were taken from the Pediatric department of Lahore General Hospital, Lahore. After taking a written informed consent from the parents or attendants their basic demographic information like name, age and sex was obtained. For final diagnosis of UTI (as per operational definition) urine sample for complete urinalysis and culture/ sensitivity was taken in aseptic measures and then was sent to hospital laboratory. All data was collected by me on Performa (attached). All collected data was entered in SPSS version 20 and was analyzed by same software. Frequency and Percentage was used for qualitative data such as gender and UTI. Mean ± S.D was used for quantitative data like age, duration of disease. Data was stratified for age, duration of disease and gender to address effect modifiers. Post stratified Chi-square test was used and p-value ≤ 0.05 was considered as significant.

RESULTS

The mean age of patients was 8±3.7 years with minimum and maximum age of 2 and 14 years. There were 47(40.87%) cases aged 2-7 years and 68(59.13%) were 8-14 years of age. Table-1. There were 76(66.09%) male and 39(33.91%) female cases with male to female ratio of 1.94:1. The mean duration of disease was 7 ± 3.7 years with minimum and maximum duration of 1 and 13 years. A

total of 59(51.30%) cases had duration of disease < 8 years while 56(48.70%) cases had duration of disease 8-14 years. Table-2. According to operational definition frequency of UTI was seen in 68(59.13%) of the cases with mean number of puss cells 15.46 ± 5.6 . When data was stratified for age, gender and duration of disease a significant association was found between gender and UTI, p-value < 0.05 while we observed no association between UTI and age or duration of disease, p-value > 0.05. Table-3,4,5. In cases with UTI there were 20(29.4%) and in non UTI cases there were 2(4.3%) cases that had febrile illness, with significant association, p-value 0.001. Among positive UTI cases there were 6(8.8%) cases that had E. coli with significant association and only 5(7.4%) cases in cases with UTI had heamaturia with no association, p-value >0.05. Table-6,7,8.

Table-1 Descriptive Statistics of Age (Years)

	Age (years)
Mean + SD	8.0 + 3.7
Range	12.00
Minimum	2.00
Maximum	14.00

Table-2 Descriptive Statistics of Duration of Disease (Years)

	Duration of Disease (Years)
Mean + SD	7.0 + 3.7
Range	12.00
Minimum	1.00
Maximum	13.00

Table-3 Comparison of Urinary Tract Infection with Age Groups (Years)

		Urinary tract infection		Total
		Yes	No	
Age (years)	2-7	32	15	47
		47.1%	31.9%	40.9%
8-14		36	32	68
		52.9%	68.1%	59.1%
Total		68	47	115
		100.0%	100.0%	100.0%

Chi-square = 2.63
p-value = 0.104

Table-4 Comparison of Urinary Tract Infection with Gender

		Urinary tract infection		Total
		Yes	No	
Gender	Male	53	23	76
		77.9%	48.9%	66.1%
Female		15	24	39
		22.1%	51.1%	33.9%
Total		68	47	115
		100.0%	100.0%	100.0%

Chi-square = 10.43
p-value = 0.001

Table-5 Comparison of Urinary Tract Infection with Duration Disease

		Urinary tract infection		Total
		Yes	No	
Duration of disease (years)	<8 years	39	20	59
		57.4%	42.6%	51.3%
8-14 years		29	27	56
		42.6%	57.4%	48.7%
Total		68	47	115
		100.0%	100.0%	100.0%

Chi-square = 2.44
p-value = 0.119

Table-6 Comparison of Urinary Tract Infection with Febrile Status

		Urinary tract infection		Total
		Yes	No	
Febrile	Yes	20	2	22
		29.4%	4.3%	19.1%
No		48	45	93
		70.6%	95.7%	80.9%
Total		68	47	115
		100.0%	100.0%	100.0%

Chi-square = 11.36
p-value = 0.001

Table-7 Comparison of Urinary Tract Infection with E. Colie

		Urinary Tract infection		Total
		Yes	NA*	
E. coli	Yes	6	0	6
		8.8%	0.0%	5.2%
No		62	47	109
		91.2%	100.0%	94.8%
Total		68	47	115
		100.0%	100.0%	100.0%

Chi-square = 4.37
p-value = 0.036

Table-8 Comparison of Urinary Tract Infection with Hematuria

		Urinary Tract infection		Total
		Yes	No	
Heamaturia	Yes	5	0	5
		7.4%	.0%	4.3%
No		63	47	110
		92.6%	100.0%	95.7%
Total		68	47	115
		100.0%	100.0%	100.0%

Chi-square = 3.61
p-value = 0.057

DISCUSSION

Cerebral palsy is characterized by motor impairment and can present with global physical and mental dysfunction. In 2001, the United Cerebral Palsy Foundation estimated that 764,000 children and adults in the United States carried the diagnosis of cerebral palsy. In addition, an estimated 8,000

babies and infants, plus 1,200 to 1,500 preschool-age children are diagnosed with cerebral palsy every year in the United States. The lower urinary tract dysfunctions manifest symptomatically as urinary incontinence, urgency, frequency, hesitancy and urinary tract infection. Pediatric urinary tract infections (UTI) account for 0.7% of physician office visits and 5–14% of emergency department visits by children annually. Accurate diagnosis of UTI has important clinical implications; most febrile infants with UTI show evidence of renal parenchymal involvement (pyelonephritis).

Possible reasons for the propensity to urinary tract infections include vesicoureteral reflux and incomplete bladder emptying resulting from detrusor hyperreflexia and detrusor sphincter dyssynergia. In addition, the impaired cognition and the inability to communicate bladder fullness and the need to void, together with an impaired mobility may also explain the tendency to urinary retention and the attendant risk of urinary tract infections. A prevalence of 2.2% - 32.5% of urinary tract infections among cerebral palsy patients has been reported by authors from developed countries. Urinary tract infection (UTI) is a problem that is frequently encountered by pediatric healthcare providers. Over recent decades, the importance of UTI has been increasingly recognized, in particular the role of UTI as an occult cause of febrile illness in young children. Cerebral palsy is a common cause of childhood morbidity. This morbidity comprised seizure disorders, mental retardation, abnormalities of vision, problems with respiratory muscle, and lower urinary tract dysfunctions.

This study was hence designed to see the frequency of UTI in patients with cerebral palsy. The mean age of patients was 8±3.7 years with minimum and maximum age of 2 and 14 years. There were 47(40.87%) cases aged 2-7 years and 68(59.13%) were 8-14 years of age. There were 76(66.09%) male and 39(33.91%) female cases with male to female ratio of 1.94:1. In one study the prevalence and the predictors of UTI among children with CP were compared to age- and sex-matched children without CP at Federal Medical Centre, Makurdi, Nigeria, from December 2011 to May 2013. The age range was between 2 and 15 years with a mean age of 6.36±3.86 years including 30 males and 22 females with a male to female ratio of 1: 0.7. Similarly, another study reviewed the published data to see occurrence of UTI in patients with cerebral palsy and found that out of the 27 patients who underwent video urodynamic studies, there were 18 girls and nine boys. The mean age at referral was 9.9 years, with a range of 3-20 years. Nearly half of the patients referred for assessment were over 11 years old. The age groups studied by other studies are compatible with our results.

In another study, 100 children with cerebral palsy were recruited out of whom, 19 patients had a history of previous UTI(s), 63% of whom also had at least some daytime urinary incontinence. Of the 81 patients without a known previous UTI, 60% were incontinent of urine and gave a prevalence of UTIs of 2.2% at admission. In our study, quite contrarily and alarmingly, according to operational definition frequency of UTI was seen in 68 (59.13%) of the cases. When data was stratified for age, gender and duration of disease a significant association was found between gender and UTI, p-value < 0.05 while

we observed no association between UTI and age or duration of disease, p-value > 0.05. Moreover, the urodynamic findings in 33 patients with cerebral palsy referred with lower urinary tract symptoms were reviewed in another study. Difficulty urinating was the predominant symptom in approximately half of the patients and half of these also had hyperreflexia and urgency when full. Three patients had varying degrees of retention and the remaining 14 had difficulty initiating a urinary stream. The other half had urgency incontinence as a major presenting symptom and this was associated in nearly all cases with hyperreflexia. There were 10 adults: 5 with difficulty urinating and 5 with urgency. The more serious manifestations, such as retention, were found only in the adults, suggesting that difficulty urinating may progress in adult life.

Yet one other study aimed to investigate the development of bladder control in children with cerebral palsy (CP) and to determinate subgroups with deviant development of bladder control and a higher risk of not achieving urinary continence. Children and adolescents between the ages of 4 and 18 years with a diagnosis of CP, from six Dutch rehabilitation centers were included in the study (n=601). In this study, prevalence of primary urinary incontinence was 23.5%. The most important factors influencing the occurrence of urinary incontinence in CP were tetraplegia and low intellectual capacity. At age six, 54% of participants with spastic tetraplegia and 80% with spastic hemiplegia or diplegia gained urinary continence spontaneously. Of those who had low intellectual capacity, 38% were dry at this age.

CONCLUSION

Hence, our study found higher frequency of UTI in children with cerebral palsy. This problem may get worse with restricted mobility. Therefore, special efforts should be made for improving quality of life of patients by physiotherapy and effective treatment.

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