

Frequency of Urinary Tract Infection in Children with Cerebral Palsy

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ABSTRACT

Objectives: To study Frequency of urinary tract infection in cerebral Palsy Children.

Study Design: Descriptive / cross sectional study.

Place and duration of study: This study was conducted in the Department of Pediatrics, Hayatabad Medical Complex, Peshawar from 01.01.2016 to 31.12.2016.

Materials and Methods: Total of 113 children with cerebral palsy, selected in a consecutive sampling and mid-stream urine specimen was collected for urine culture to detect UTI. Cerebral Palsy children aged 3 years to 15 years of both genders were included in the study. Those cerebral palsy children not fulfilling criteria were excluded

Results: The mean age group of the sample was 7.8 ± 3.6 years. 68.1% of the sample was male and 31.9% were female gender. In our study, UTI was recorded in 32.7% of patients with more propensities towards age group above 5 years ($p < 0.001$)

Conclusion: The present study points to a high prevalence of urinary tract infections (UTI) among in children with cerebral Palsy, which may be due to severe immobility. Therefore, rigorous efforts should be put in place for effective physiotherapy aimed at achieving the greatest possible mobility and independence among children with cerebral Palsy.

Key Words: Cerebral Palsy, Pyrexia, Urinary Tract Infection, Urine Culture.

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INTRODUCTION

Incidence of cerebral Palsy is 2-25/1000 live¹. In the last 40 years this rate has not changed. LBW and prematurity are major risk factors for cerebral palsy. Very low birth weight infants are 20-80 times more prone to cerebral palsy than those infants having birth weight of 2.5 kg². Risk factors must not be confused with etiology as cause is unknown in majority of cases. Motor damaged occur in CP subjects after series of insult³.

Yearly incidence of CP in United States is 1 out of 278 infants⁴. To find the frequency of CP in Pakistan a trial was done on a sample of 160 cases with abnormality of tone, posture and movement, 120 out of the had CP⁵. Initially hypoxic ischemic encephalopathy was considered to be the cause of CP. In recent studies multiple factors are responsible for CP. Prenatal, and postnatal injury to developing brain due to any of determinant i.e genetic factors, low birthrate, prematurity and multiple gestation result in CP⁶.

Mental retardation, seizure disorders, abnormalities of vision, respiratory problems and lower A cerebral palsy child had injury to brain before it was fully matured. It is a non-progressive injury and they have difficulty in neuromuscular control. urinary tract dysfunctions or associate morbidities with cerebral palsy⁷ urgency frequency hesitancy, urinary incontinence and urinary tract infection or manifestation or lower urinary tract dysfunctions⁷.

The possibility of UTI in CP subjects may be due to Vesicoureteral reflux and incomplete bladder emptying resulting from detrusor hyperreflexia and detrusor sphincter dyssynergia. They have impaired cognition and are immobile, therefore cannot communicate regarding bladder fullness and need to micturate, as a result of urinary retention are prone urinary tract infections is reported in a study in 38.5% of CP children in a study by Anígilájé EA et al⁸.

The present study is designed to determine the frequency of UTI in children presenting cp. As mentioned above, the CP children are very prone to Urinary tract abnormalities and neurogenic bladder if leads to reflux can cause UTI among children with CP. This study will highlight the magnitude of the problem and the results of this study will be shared with other local pediatricians and suggestions will be given regarding future research or screening of children presenting with CP for UTI.

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MATERIALS AND METHODS

This study is descriptive / cross-sectional study, conducted in Department of Pediatrics Hayatabad Medical Complex, Peshawar. The duration of study was one year, sample size was 113, using proportion of 38.5% of UTI among children with CP, with 95% confidence interval and 9% margin of error using WHO sample size calculate sampling technique was non probability consecutive.

Children of both genders with ages 3 years to 15 years having Cerebral Palsy were included in the study.

Children with history of complicated UTI, history of antibiotic or steroid use in last one month were not enrolled in the study.

Data Collection Procedure: Hospital ethical research committee approved the study to be conducted. Those CP children who had fever and were fulfilling inclusion criteria were included in the study. Written informed consent was taken from parents after explaining them purpose and benefit of the study.

History and clinical examination was carried on all patients to be studied. From all the children, a two specimen of clean mid stream urine (02 hours apart) was obtained and sent to hospital laboratory to detect UTI. All the laboratory investigations was done under supervision of same consultant microbiologist having minimum of five years of experience.

A predesigned proforma was used to record all the information according to inclusion criteria and avoid confounders and bias by strictly adhering to exclusion criteria.

Data Analysis Procedure: SPSS version 20 was used to store data and analyse it quantitative variables like age were calculated by mean+SD categorical variables like gender and UTI were calculated via frequencies and percentages. To see the effect modifications UTI was stratified among age and gender. Tables and graphs were used to present the results.

RESULTS

The study was conducted on 113 children with cerebral palsy who presented with fever.

The mean age of the sample was 7.8 ± 3.6 years. Minimum age of 3.5years to maximum 13.5 years with mean 10 years were age ranges in our study. Sample was grouped in different age groups, it was observed that patients in the age group up to 5 years were 33.6%, patients in the age group > 5 to 10 years were 36.3% and patients in the age group > 10 to 15 years were 30.1%. (Table 1).

Table No.1: Age-Wise Distribution of Sample (n=113)

Age Groups	Frequency	Percent
Up to 5 years	38	33.6
> 5 to 10 years	41	36.3
>10 to 15 years	34	30.1
Total	113	100.0

Table No.2: Gender-wise distribution of sample (n=113)

Gender	Frequency	Percent
Male	77	68.1
Female	36	31.9
Total	113	100.0

Table No.3: Frequency of urinary tract infection (n=113)

UTI	Frequency	Percent
Yes	37	32.7
No	76	67.3
Total	113	100.0

Table No.4: Age group wise stratification of UTI (n=113)

		Urinary Tract Infection		P Value
		Yes	No	
Age Groups	Up to 5 years	0	38	< 0.001
		0.0%	100.0%	
	> 5 - 10 years	29	12	
	70.7%	29.3%		
>10 - 15 years	8	26		
	23.5%	76.5%		
Total		37	76	
		32.7%	67.3%	

Table No.5: Gender group wise stratification of UTI (n=113)

		Urinary Tract Infection		P Value
		Yes	No	
Gender of the patient	Male	23	54	0.34
		29.9%	70.1%	
Female	14	22		
	38.9%	61.1%		
Total		37	76	
		32.7%	67.3%	

It was observed that in our study 68.1% of the sample was male and 31.9% were female gender, when the patients were distributed on the basis of their gender. (Table 2)

Form all the patients, a mid stream specimen of urine was collected in sterile container and was sent to hospital laboratory for detection of UTI which is defined where Urine analysis showed greater than or equal to 2-5 WBCs or 15 bacteria per high power field (HPF) in centrifuged urine sediment and the urine culture yielding growth of more than 10^5 organisms per ml of urine. In our study, UTI was recorded in 32.7% of patients. (Table 3).

We observed that the difference was statistically significant after applying chi square test with a p value of < 0.001, when UTI was stratified with respect to age group. (Table 4)

We observed that difference was statistically insignificant after applying chi square test with a p

value of 0.34, when UTI was stratified with respect to gender. (Table 5).

DISCUSSION

Acute urinary tract infection (UTI) is common problem of childhood. 8.4% of girls and 1.7% of boys experience at least one episode of UTI till they are seven years old⁹. Mortality is rare but morbidity is common. 40% of the patients need hospital admission particularly infants. Transient renal damage occurs in 40% patients and 5% get permanent damage¹⁰. This can occur even after a single infection. Younger children suffer from systemic symptoms such as fever, lethargy, anorexia and vomiting, localized symptoms are real. More than 80% of cases have UTI due to *Escherichia coli*¹¹, and are treated with a course of antibiotics.

Even those who had experienced single UTI are at risk for further infections, 30% children get recurrent UTI. Vesicoureteric reflux (VUR), previous infection and unstable bladder are risk factors for recurrent UTI^{11, 13}. Girls are more prone to recurrent UTI than boys.

Febrile urinary tract infection is more common both sexes in first year of life, where as girls older than 3 years are more prone to nonfebrile UTI¹⁴. Localized symptom occur in urinary tract infections confined to bladder, they are common after infancy and are easily treatable in contrast febrile urinary infection increases probability of renal involvement (sensitivity 53 to 84%; specificity, 44 to 92%)¹⁵. This is usually associated abnormalities of urological system and greater risk of renal scarring¹⁶. Urinary tract infection leading to renal scarring has been considered as a cause of long term morbidity.¹⁶ Children with proven urinary tract infections are intensively evaluated and treated. They receive antibiotic prophylaxis and often undergo surgery¹⁵. Such approaches have questioned^{17,18}. Various studies and trials have been done, for assessment and management of febrile urinary tract infections and subsequent interventions for them.

In our study, we studied the frequency of UTI in children presenting with cerebral palsy and fever. We observed it to be 32.7% with equal propensity of either gender towards UTI. Studies that reported the epidemiology of UTI's in children have varied them by population, sampling method, and diagnostic criteria. Rates vary widely, from 0.25% in a small UK - GP study¹⁹ to 13.5% in a hospital-based study of febrile infants²⁰.

In our study frequency of UTI is 32.7% which is comparable to Ozturk et al. in Turkey. Who reported 32.5%²¹ but it is not comparable with Reid and Borzyskowski in London 7.4%²². And Hellquist et al in North Carolina 2.2%²³. The differences in frequency of UTI in latter two studies^{22, 23} may be due to the prior use of antibiotics, although not reported in our study. CP usually have repeated urinary symptomatology, constipation, enuresis and recurrent UTI confirmed by

laboratory in comparison to age and sex matched non CP subjects. Ozturk et al. in also reported same findings.

CP children have difficulty in mobility, parents and siblings have to carry them from one place to another. Their families need manually propelled or electrically powered wheelchairs, for which they don't have access. These are neglected children who stay supine for long period of time resulting in development of pressure source on dependent body parts. They have poor personal hygiene and remain soil most of the time in their feces resulting in increase risk of UTI. Few of them may be continent but because of immobility retain urine, as are unable to attend the toilet resulting in UTI. Poor water intake due to immobility results in kidney stones which may predispose to UTI²⁴. In addition some of these children have high burden of pinworms²⁵ which may be linked to higher risk of UTI. Poorly mobile CP children had propensity to develop constipation which also contributes to higher risk of UTI in this group of children.

We found that all the CP children with UTI are over-five in our study. These findings in our studies resulted due to recruitment bias as 65% patients included were over 5 years. When CP patients come for follow up in our clinics we should review symptoms of UTI as it presents symptomatically, it should be confirmed and treated in order to prevent its potential complications.

CONCLUSION

We concluded from this study that severe immobility in CP children is responsible for high prevalence of UTI, therefore efforts should be made for effective physiotherapy, so that CP children can attain maximum mobility and independence.

Author's Contribution:

Concept & Design of Study:	Rahida Karim, Jahanzeb Khan Afridi
Drafting:	Rahida Karim, Ahmad Saud Dar, Muhammad Batoor Zaman
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Revisiting Critically:	Ahmad Saud Dar, Jahanzeb Khan Afridi, Muhammad Batoor Zaman
Final Approval of version:	Rahida Karim, Jahanzeb Khan Afridi

Conflict of Interest: The study has no conflict of interest to declare by any author.

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