

Etiological Factors Affecting UTI in Children with Cerebral Palsy

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ABSTRACT

Background: Cerebral palsy (CP) is a common chronic neurological disorder in early childhood. Most of the children with spastic and dyskinetic CP suffer from severe motor dysfunction. UTI is not very uncommon in CP. The important factors causes UTI can be detected early to introduce therapeutic intervention for a better outcome and improve quality of life of CP patients.

Objectives: To ascertain the socio demographical factors affecting patients with UTI in different types of cerebral palsy.

Methodology: This study an observational study was done in Dhaka Shishu (Children) Hospital, the largest children hospital in Bangladesh. The inclusion criteria of the study were children with cerebral palsy, having fever. Total 30 patients were seen. 15 were having UTI as case, and 15 was taken as control. For UTI it was categorized as for the purpose of this study, the following definitions were applied: Asymptomatic bacteriuria (ASB) or asymptomatic urinary tract infection (AUTI) is defined as the quantitative growth of bacteria, greater than or equal to 10^5 colony forming units per milliliter urine of the same organism, on collected midstream urine specimens, in the absence of symptoms of urinary tract infection. Symptomatic bacteriuria (SB) or symptomatic urinary tract infection (SUTI) is defined as the quantitative growth of bacteria, greater than or equal to 10^5 colony forming units per milliliter urine of the same organism, on collected midstream urine specimens, in the presence of one or more than one of these signs and, or symptoms of urinary tract infection including fever, dysuria, gross hematuria, cloudy or smelly urine, frequency of urination,

and flank/back pain. Severity of different domains were assessed by RNDA.

Results: In this study 30 patients were included. Severe motor impairment was seen in were seen mostly in spastic tetraplegia & dyskinesia cerebral palsy. Male female ratio. Significant risk factors were in Nutritional status, constipation, severe motor impairment.

Conclusion: Most of the cerebral palsy patients have severe motor problems. Treatable causes of infections should be identified early to reduce the diseases burden and suffering of patient with cerebral palsy who have severe motor impairment, constipation, recurrent fever, poor nutritional status.

Keywords: Cerebral Palsy, Symptomatic Bacteriuria, Spastic, Dyskinetic.


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INTRODUCTION

UTI is not very uncommon in children with cerebral palsy. In cerebral palsy children may present with voiding dysfunction which usually manifests as urinary incontinence, besides abnormalities of gross motor function and posture.¹ Some studies attribute their susceptibility for urinary tract infection (UTI) to voiding dysfunction caused by upper motor neuron lesion and neurogenic bladder.^{2,3} Others link the voiding dysfunction to detrusor-sphincter dyssynergia.^{4,5}

As a common infectious cause of morbidity in childhood⁶, UTI may, in the future, lead to renal scarring, and subsequently to hypertension and end-stage kidney disease if it is not appropriately and promptly treated.⁷⁻⁹

Although the management protocol of cerebral palsy involves a multi-disciplinary approach, routine screening and treatment for UTI may become an important component if the risk and prevalence of the infection in these children are high. For instance, the evidence from published systematic reviews and meta-analyses confirm that the pooled UTI prevalence rate in severe acute malnutrition (SAM) is significantly high.^{10,11} Screening and treatment for UTI in their management protocol are recommended by some authors.¹⁰ One of the studies even suggested that these patients are not more susceptible to UTI than their normal and healthy counterparts.¹² However, other studies reported very high UTI prevalence rates in children and

adolescents with this neurologic disorder.^{5,15-17} These disparities may be due to the non-uniformity of study designs and the possibility of different forms of bias in these studies. It is an important issue of management of any infection in children with cerebral palsy. So, this study is done to ascertain the sociodemographical factors affecting patients with UTI in different types of cerebral palsy.

OBJECTIVES

To ascertain the socio demographical factors affecting patients with UTI in different types of cerebral palsy.

METHODOLOGY

This study was a case control observational study which was done in Dhaka Shishu (Children) Hospital, the largest children hospital in Bangladesh. The inclusion criteria of the study were children with cerebral palsy, having fever. Total 30 patients were seen. For UTI it was categorized as for the purpose of this study, the following definitions were applied: Asymptomatic bacteriuria (ASB) or asymptomatic urinary tract infection (AUTI). Symptomatic bacteriuria (SB) or symptomatic urinary tract infection (SUTI) is

defined as the quantitative growth of bacteria, greater than or equal to 10⁵ colony forming units per milliliter urine of the same organism, on collected midstream urine specimens, in the presence of one or more than one of these signs and, or symptoms of urinary tract infection including fever, dysuria, gross hematuria, cloudy or smelly urine, frequency of urination, and flank/back pain. A structured questionnaire was used to identify different sociodemographical factors like age, sex, malnutrition, H/O previous UTI, H/O constipation, some clinical factors like degree of fever, hematuria, GMFCS, dysuria, frequency, types of cerebral palsy were included as risk factors for UTI. Chi square test was done for qualitative variables and Odds ratio with 95 % confidence interval was seen as risk.

RESULTS

Total 30 patients of different ages with cerebral cases were seen among them 15 were case and 15 were control.

In figure 1 frequency is higher in 3-4 years and 6-7 years of age; mean age is 3.16±1.39 years.

In figure 2 Male are 12 (40%) in number and female is 18 (60%) in number.

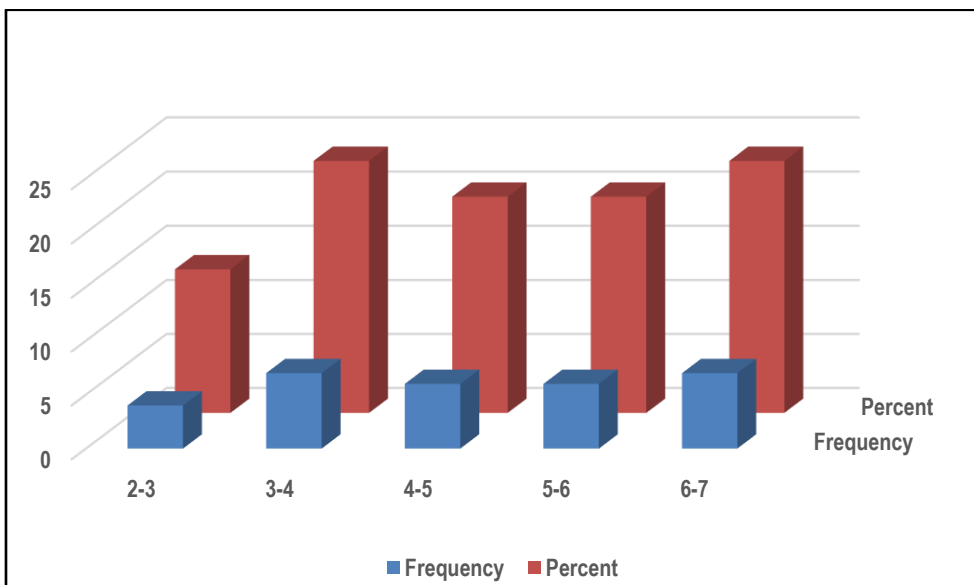


Figure 1: Age of the CP child with UTI

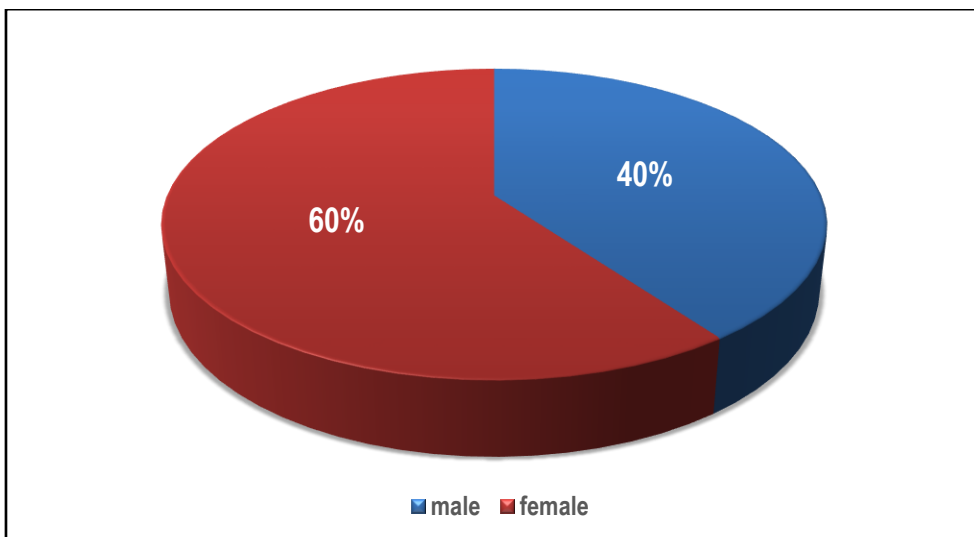


Fig: 2 Distribution of sex

Table 1: Socio demographical factors for UTI in CP child

	UTI present	UTI absent	P value	OR 95% confidence interval
Age				
2-3	3	1	.054	
3-4	6	1		
4-5	3	3		
5-6	5	1		
6-7	3	4		
Sex				
Male	8	5	0.242	
Female	14	3		
Malnutrition				
Present	20	1	.000	1.25-14.6
Absent	2	7		
H/O UTI				
Present	20	2	.001	1.084-12.1
Absent	2	6		
Types of CP				
Spastic CP	13	2	.000	1.258-14.60
Spastic diplegia	0	4		
Dyskinetic CP	6	1		
Mixed CP	2	1		
Hypotonic CP	0	1		

Table II: Clinical presentation of the patients

	UTI present	UTI absent	Pvalue	OR
Dysuria				
Present	16(72.7%)	6(27.3%)	0.666	0.289-8.859
Absent	5(62.5%)	3(37.5%)		
Frequency				
Present	17(73.9%)	6(26.1%)	0.640	(0.365-12.385)
Absent	4(53.1%)	3(42.9%)		
Hematuria				
Present	10(71.4%)	4(28.6%)	1	0.596
Absent	11(68.8%)	5(31.2%)		
Culture				
Positive	13(92.9%)	1(7.1%)	0.017	1.36-12.5
Negative	8(50%)	8(50%)		
GMFCS				
I	0(0%)	1(0%)	0.027	
II	0(0%)	2(0%)		
III	4(66.7%)	2(33.3%)		
IV	8(66.7%)	4(33.3%)		
V	9(100%)	0(0%)		
Fever				
High grade	12(66.7%)	6(33.3%)	0.704	0.13-3.41
Low grade	9(75%)	3(25%)		
Constipation				
Present	18(81.8%)	4(18.2%)	0.032	1.246-45.153
Absent	3(37.5%)	5(62.5%)		

Table I shows sociodemographic factors causing UTI in CP. Age representing 3-4 years and 5-6 years representing more cases of UTI which is statistically significant. Female child has more UTI than male which is not significant. Malnutrition, Previous H/O UTI, Types of CP is important factors which statistically significant.

In table II different clinical factors play important role. Among these Gross motor functional classification, constipation and culture positivity is found significant association with UTI with high risk. But dysuria, frequency, hematuria and degree of fever showed no association with UTI.

DISCUSSION

UTI is a very important and frequent infection which occurs in chronic disabilities especially in motor dysfunction. There are lots of factors which were seen like age, sex, malnutrition, previous H/O UTI, Types of cerebral palsy in sociodemographic factors. In this study age of presentation is found as important factors probably due to toilet training and motor severity. Malnutrition is related to frequency of infection. H/ O Previous UTI is an important factor for management. Types of CP is also important for severity of motor dysfunction which may cause UTI.

Furthermore, the symptoms and signs of UTI, a history of constipation, a prior history of UTI, urinalyses findings, and culture proven UTI were significantly more frequent in subjects with cerebral palsy than their age- and sex-matched comparators without cerebral palsy. Similar findings have also been reported by Ozturk et al. in Turkey.¹⁶

In univariate regression analysis, only moderate to severe gross motor dysfunction significantly predict the risk of UTI among our subjects with CP. These are children who often have to be carried from one place to the other by their siblings or their parents because of difficulty in mobility. Often, these children are supine in one place for a long time, with the majority developing pressure sores on the occiputs and the buttocks and the poor personal hygiene, UTI may develop easily following urinary retention resulting from the difficulty in getting to the toilets to micturate in a few that may be urinary continent.¹⁸

In clinical evaluation dysuria, frequency, hematuria, degree of fever, constipation, types of gross motor dysfunction, constipation and culture positivity were seen where constipation, GMFCS and its severity, and culture positivity were seen as significant with high risk. Fever is a very important clinical symptom of UTI. Every child had fever but the grade of fever either high grade or low grade had no association with UTI. Similar findings were seen in another study.

CONCLUSION

Most of the cerebral palsy patients have severe motor problems. Treatable causes of infections should be identified early to reduce the diseases burden and suffering of patient with cerebral palsy who have severe motor impairment, constipation, recurrent fever, poor nutritional status. Moreover, age and types of cerebral palsy should also be considered as important risk factors.

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