

Impact of Constipation in Children on Urinary Tract Infection (UTI)

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Abstract

Objectives: The study was done to find out the relationship between constipation and urinary tract infection (UTI) in children.

Methods: The study was a case control study between two groups in a tertiary care children hospital in Dhaka city. In group-1 (n=45) those children having history of constipation and in group-2 (n=78) as a control group having no history of constipation were included in this study. Growths of a single species of organism with colony count of $>10^5/ml$ in a clean-catch midstream single urine sample was considered as evidence of urinary tract infection.

Results: Positive urine culture was found in 8.9% (4/45) cases in children who had history of constipation and 1.3% (1/78) in children who had no history of constipation. Though the number of positive urine culture was seven times more in children with constipation than those who were not constipated but the difference between the two groups was not statistically significant ($p=0.059$).

Conclusion: Culture documented UTI in children with constipation is seven times more than without constipation showing impact of constipation on urinary tract infection (UTI) in children.

Key words: Urinary tract infection (UTI), constipation.

Introduction

Constipation is a common paediatric problem, which remains underdiagnosed and poorly treated sometimes. We are aware about constipation but parents are not aware enough about its complications. So, primary level physicians as well as guardians should remain aware about impact of constipation and its after effect. Children with recurrent urinary tract infection were noted to have large fecal reservoirs by rectal examination and rectal manometry^{1,2}. The bladder residue and upper renal tract dilatation after micturition were significantly increased in children with constipation and improved after treatment³. In chronic constipation due to mechanical effect of a loaded rectum impair bladder emptying and inhibited bladder

by stimulation of detrusor stretch receptors may cause vesicoureteral reflux and urinary tract infection⁴. Below 5 years of age chance of VUR is more common and if there is associated constipation the chance of VUR is much more increased. Evaluation of urinary tract infection should include an inquiry about bowel habits. Relief of constipation results in disappearance of recurrent urinary tract infections^{5,6}. Long term consequence of UTI from sub clinical infections can lead to severe bilateral renal scarring, increasing the risk of hypertension and renal failure. Therefore, even a single UTI in a child must be taken seriously. Some children have asymptomatic bacteriuria, which is clinically silent. Children with this condition often have a spontaneous remission within a few months and are better left untreated. Among patients with asymptomatic bacteriuria reflux is found in 11% cases, though it is mild⁷. In school going children those found asymptomatic bacteriuria on screening, VUR was found in 19% to 35% cases and renal scarring in 10% to 26% cases. Many of these children had a prior history of symptomatic UTI and they might have infection during infancy that were overlooked or misdiagnosed⁷. No clinical or laboratory findings distinguish asymptomatic bacteriuria from subclinical infection. The obvious goals of UTI management are

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to provide symptomatic relief and to take preventive measures to reduce the incidence of urinary tract infections. This hospital based study was done to find relationship between constipation and urinary tract infection in children.

Materials and Methods

This case control study was carried out from January 2003 to June 2004 in the outpatient department of Dhaka Shishu Hospital. Passage of fewer than three stools per week or passage of hard stool with difficulty or delay in defecation causing distress for more than one-month duration was considered as constipation. Forty five children of below 12 years of age with a history of constipation were included in this study in group-1 and 78 children of same age who had no history of constipation were enrolled in group-2. Febrile, sick, unconscious, immunocompromised and children with clinical feature of UTI were excluded from this study in both groups. Children clinically suspected having congenital urinary or anorectal anomalies were also excluded. Data were collected in a questionnaire form from both groups after getting informed consent from the parents.

Detail history of the children was taken and relevant examinations were also done among the both groups of study population. Urine sample was collected aseptically from all cases to do culture. To prevent contamination by periurethral flora, clean-catch midstream urine specimen was collected after proper washing of the genitalia. Urine samples were collected directly in a sterile glass or plastic bottle and below 2 years of age group sterile disposable plastic bag was used to collect urine. Within one hour of collection culture was done at 37°C temperature for 24 hour on blood agar and McConkeys agar media. Urine culture was done in microbiology department of Dhaka Shishu Hospital. Colony count was done by loop method. In this study growths of a single species of organism with colony count of >10⁵/ml was considered significant evidence of UTI. For each study subject urine sample was collected for culture once prior to any antibiotic therapy. Urine analysis to see pyuria was not done in this study as it is mostly inconclusive to detect UTI along with marked diurnal and sex variation in number of pus cells.

Data were analyzed by using statistical package for social science program (SPSS 11.0 version). Chi square (χ^2) test was used for comparative analysis between two groups of study population. At 95% confidence limit p value less than 0.05 was labeled as significant. Ethical permission was taken from ethical review committee of Dhaka Shishu Hospital.

Results

Majority of the children, 36/45 (80%) in group-1 and 50/78 (64%) in group-2 included in this study were below 5 years of age. Mean age was 2.5 year in group-1, and 2.8 year in group-2, showing statistically no significant difference between these two groups (p>0.05).

In group-1, 46.7% (21/45) were female and 53.3% (24/45) were male. In group-2, 44.9% (35/78) were female and 55.1% (43/78) were male. Male: Female ratio was 1.14:1 in group-1, and 1.23:1 in group-2 showing no gender biasness (p>0.05). Almost half of the children

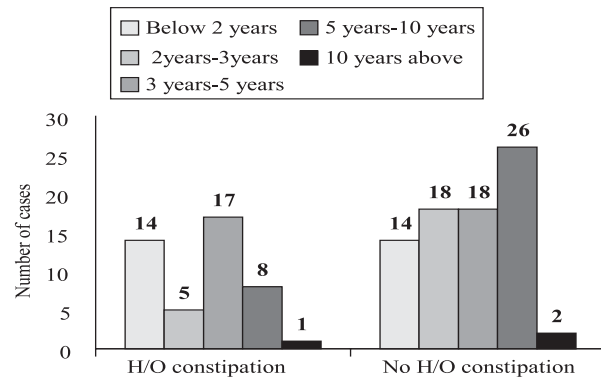


Fig.-1: Age distribution of the study population

in both groups came from urban area 51.1%, (23/45) in group-1 and 53.8 % (42/78) in group-2, alongside 48.9% (23/45) in group-1 and 46.2 % (42/78) in group-2 came from rural area.

Majority of the children in both group were not used to take daily vegetables (fibrous food) in diet, 15.6% (7/45) children in group-1 and 34.6% (27/78) in group-2 were found to take daily vegetables (fibrous food) in diet. Statistically significant positive relationship was found between constipation and absence of vegetables (fibrous food) in children’s daily diet (p=0.035). Past history of dysuria was present in 42.2% (19/45) cases in group-1 and 21.8% (17/78) in group-2, showing significant more proportion of past history of dysuria among children with constipation than without constipation (p=0.023).

Positive urine culture was found in 8.9% (4/45) cases in children having history of constipation (group-1) and 1.3% (1/78) in children having no history of constipation (group-2). Though the proportion of positive urine culture was seven times more in children, with constipation, but the difference was not statistically significant in this study (p=0.059) (Table-I). Organisms isolated from the culture positive cases were E. coli, Proteus and K. pneumoniae (Table-II).

Table-I
Results of urine culture among the children in the study (N=123)

Urinary culture	Group-1 n (%)	Group-2 n (%)	P* value
growth of organism	4 (8.9)	1 (1.3)	
No growth of organism	41 (91.1)	77 (98.7)	0.059
Total	45	78	

*Chi-square

Table-II
Isolated organisms from urine culture (N=123)

Organisms	Group-1		Group-2	
	Female	Male	Female	Male
<i>E.coli</i>	02		01	
<i>Proteus</i>		01		
<i>Klebsiella pneumoniae</i>		01		
Total	02	02	01	00

Discussion

In this study attempt was made to find out relationship between constipation and urinary tract infection. No significant age difference was found between two groups and male predominance was found in both groups. Male preponderance in this study in both groups might be due to more caring attitude of the parents towards their male child. This is similar to results obtained by Wever and Steiner⁸.

In this study evidence of urinary tract infection by positive urine culture was found in 8.9% (4/45) cases in children having constipation. Loening-Baucke⁵ in his study found urinary tract infection in 11% cases in children with constipation, which correlates with our study.

In this study no sex predominance was found among the culture positive cases in children with constipation which differ from the study of Loening-Baucke⁵ where he found urinary tract infection to be more commonly present in girls than in boys (33 % Vs 3 %) with constipation. That difference may be due to small sample size in our study.

Culture documented UTI was found seven times more in children with constipation, though it was not statistically significant in this study. Association between constipation and UTI was also found in other studies^{3,9-15}. Findings of this study were consistent in most aspect with the

studies, already cited in the discussion. We have to take preventive measures to reduce the incidence of urinary tract infection, by taking effective measures in all constipated children. There were some limitations in this study as multiple urine samples were not used in this study, sample size in this study was small and for urine culture morning urinary sample collection was not possible and that can miss culture positive cases. A large sample size study and morning urine sample or multiple samples may overcome the limitations and can show positive relationship between constipation and urinary tract infection in children.

Conclusion

It may be concluded from this study that culture documented UTI in children with constipation is seven times more than without constipation showing impact of constipation on urinary tract infection (UTI) in children. Measures may be taken to prevent constipation and thereby UTI in children.

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