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Research Article

Clinical study of urinary tract infection in children

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ABSTRACT

Background: The urinary tract infection is a significant cause for morbidity and mortality in children. The studies have shown that urinary tract infections in the early childhood are potentially dangerous, because they are the forerunners of the several renal diseases in the adulthood. Urinary tract infection is not isolated even but represents a complex situation which may follow a variety of courses during the life time of an individual. The objective was to study the incidence of urinary tract infection in children.
Methods: The present study was carried out in Government general hospital, Gulbarga for a period of two years. In these prospective study 60 cases of urinary tract infection who were admitted in pediatric medical and pediatric surgical wards of Government general hospital with signs and symptoms suggestive of urinary tract infection were included in the study. Detailed history and complete clinical examination was done as per proforma. Routine urine examination was carried out.
Results: The maximum numbers of cases were in the age group of 5-12 years. The male: female ratio was 1.3:1.70% came from rural area. Most of the cases were from lower classes. Maximum cases were noted in grade III malnutrition i.e. 30% and in grade I i.e. 23.3%. Maximum patients presented with fever i.e. 90% at the time of admission.
Conclusions: The majority of the children in the present study were in the age group of 5-12 years. The male to female ratio was 1.3:1. Incidence of urinary tract infection was more in rural area than urban. Most of the children were from lower classes. Incidence was more in grade III malnourished children. Fever was the most common presenting symptom.

Keywords: Urinary tract infection, Children, Incidence

INTRODUCTION

The urinary tract infection is a significant cause for morbidity and mortality in children. The studies have shown that urinary tract infections in the early childhood are potentially dangerous, because they are the forerunners of the several renal diseases in the adulthood. Urinary tract infection is not isolated even but represents a complex situation which may follow a variety of courses during the life time of an individual.[1]

If the predisposing factor is recognized early and eliminated, then one step does not necessarily lead to the other. The concept of persistent significant bacteriuria with criterion of over 1,00,000 organisms per ml of urine is excellent operational definition when the clean method is used to collect urine specimen.[2]

The screening of bacteriuria has contributed significantly to the understanding of the epidemiology and natural history of urinary tract infections in girls showing asymptomatic bacteriuria in the childhood remains at high risk of developing pyelonephritis at the time of

pregnancy. The awareness of the importance of early diagnosis and eradication of urinary tract infection before it settles in the kidney has led to the following advances:

1. Screening of asymptomatic but vulnerable population for significant bacteriuria (preschool children and school going girls).
2. Methods of localization of the site of infection.
3. Recognition of the cause of persistent urinary tract infection (vesico-ureteric reflux, immunological factors, host factors).
4. Various regimes of chemotherapy (short course, continuous single bed time low dosage, long term therapy).

The present study was done to find out the prevalence of urinary tract infection among the children which are admitted in a tertiary care hospital.

METHODS

The present study was carried out in Government general hospital, Gulbarga for a period of two years. In this prospective study 60 cases of urinary tract infection who were admitted in paediatric medical and paediatric surgical wards of Government general hospital with signs and symptoms suggestive of urinary tract infection such as fever, burning micturition, retention of urine, dribbling of urine etc. were included in the study.

Detailed history and complete clinical examination was done as per proforma. Routine urine examination was carried out for albumin, sugar, and microscopic examination for pus cells epithelial cells, and bacilli. The remaining amount of urine was carried to laboratory of Microbiology Department, M.R. Medical College for colony count culture and sensitivity.

Urine for protein

About 5 ml of urine sample was taken in clean test tube and heated the upper portion of it over a flame, white turbidity or precipitate was found to which glacial acetic acid, is added if it is dissolved it was due to phosphates. If it did not dissolve, it indicates proteinuria.

Urine for sugar

About 5 ml of Benedict's reagent was taken in a test tube, was boiled, if there was no colour change, then 8 drops of the urine specimen were added to it and again boiled, if there was any colour change and precipitate formed then it indicated glycosuria.

Urine for microscopic examination

About 5 ml of urine was taken in small test tube and centrifuged it with speed of 3000 rpm for 5 minutes. The supernatant urine was discarded, and then the sediment is placed on clean glass slide with cover slip placed over it and examined under high power lens of microscope for pus cells, epithelial cells, casts, bacteria and red blood cells. The criteria taken for study for the evidence of urinary tract infection was 5 or more pus cells in centrifuged specimen.

RESULTS

Total 60 cases of urinary tract infection aged below 12 years were admitted in pediatric ward and pediatric surgical wards of the Government general hospital were taken for the study.

Table 1: Age incidence of the study population.

Age group (years)	Number	Percentage (%)
1-2	17	28.3
2-5	13	21.6
5-12	30	50
Total	60	100

The maximum numbers of cases were in the age group of 5-12 years i.e. 50% followed by 1-2 years (28.3%) and 2-5 years (21.6%).

Table 2: Sex incidence of the study population.

Sex	Number	Percentage (%)
Male	34	56.6
Female	26	43.3
Total	60	100

There were 34 males (56.6%) and 26 (43.3%) females. The male:female ratio was 1.3:1.

Table 3: Incidence of urinary tract infection in urban and rural areas.

Area	Number	Percentage (%)
Urban	18	30
Rural	42	70
Total	60	100

42 children i.e. 70% came from rural area and 18 i.e. 30% from urban areas.

Table 4: Incidence of urinary tract infection in different social classes

Social class	Number	Percentage (%)
Upper	0	0
Middle	14	23.4
Lower	46	76.6
Total	60	100

Most of the cases were from lower classes with 76.6% and 23.3% incidence in middle class and no upper class paediatric patient was admitted in Government general hospital, Gulbarga during the study.

Table 5: Incidence of urinary tract infection in different nutrition grades.

Nutrition grade	Number	Percentage
Normal	6	10
Grade I malnutrition	14	23.3
Grade II malnutrition	10	16.6
Grade III malnutrition	18	30
Grade IV malnutrition	12	20

Taking nutritional classification based on Indian Academy of Paediatrics, maximum cases were noted in grade III malnutrition i.e. 30% and in grade I i.e. 23.3%. 90% of cases were having varying grades of malnutrition ranging from grade I to IV and only 10% of cases were having normal nutrition.

Table 6: Clinical features at the time of presentation.

Clinical features	Number	Percentage
Fever	54	90
Burning micturition	11	18.3
Pain abdomen	12	20
Palpable bladder	7	11.6
Loss of appetite	5	8.3
Handling of genitalia	4	6.6
Convulsion	4	6.6
Splenomegaly	3	5
Dribbling of urine	2	3.3
Mass in abdomen	5	8.3
Phimosis	0	0

Maximum patients presented with fever i.e. 90% at the time of admission. Other common symptoms were pain abdomen 20%, burning micturition 18.3%, and palpable bladder in 11.6% of cases.

DISCUSSION

The present study was carried out on 60 cases of urinary tract infection. Grag et al[1] reported 35.48% in the age group of 5-12 years, 32.79% of cases in the age group of 0-2 years and 31.17% of cases in the age group of 2-5 years. Shiela Ethraj et al[2] have noted 29% in the age group of 5-12 years. 47% of cases were in the age group of 0-2 years and 24% in the age group of 2-5 years. In the present study, maximum number of cases i.e. 30 cases (50%) were seen in the age group of 5-12 followed by 17 cases (28.3%) in the age group of 1-2 years and 13 cases in the age group of 2-5 years (21.6%). In the present study, 50% of cases were in the age group of 5-12 years probably due to increased incidence of vesicle calculus causing stasis, obstruction and infection.

Grag et al[1] have reported urinary tract infection in 26.9% of males and 73.1% of females. Though the clinical study in most show female predominance but Varma et al[3] reported higher male sex incidence in asymptomatic bacteriuria. The sex incidence reveals 56.6% as males and 43.3% as females. Thus indicating male to female ratio of 1.3:1. In the present study, increase incidence of urinary tract infection in the male patients is due to higher incidence of urinary tract infection associated with vesicle calculus leading to stasis of urine and allowing the micro-organisms to multiply in urine.

Belapurkar et al[4] in their study reported 76% of incidence of urinary tract infection among rural dwellers as compared to 24% of their urban counterparts. The increased incidence of urinary tract infection in rural areas may be due to poor perineal hygiene and due to drinking of water from the open well and bore wells which contains more minerals that leads to increased incidence of stones in the genitor urinary system.

In the present study out of 46 cases (76.6%) of cases were from lower social class whereas there were only 14 cases (23.3%) from middle class and no case from upper class. The higher incidence of urinary tract infection in the lower class is due to the poor perineal hygiene, toilet habits and also due to majority of admission belongs to lower social classes.

Study done by Freyre et al[5] where in urinary tract infection incidence in malnourished children and nourished children was same. The present study indicated higher incidence of urinary tract infection among grade III malnourished children i.e. 30% of grade III malnourished children was having urinary tract infection. But only 10% of incidence was found among children with normal nutritional status as per Indian academy of pediatrics classification. Though it was found that the incidence of urinary tract infection was higher in grade III malnourished children, it will not depend on the severity of the protein energy malnutrition. It may be that, factors other than protein energy malnutrition play a greater role in urinary tract infection. Urinary tract infection may be due to for protein energy malnutrition as this area belongs to lower social class.

Grag et al[1] in their study have noted fever in 93.9% of cases, while Belapurkar et al[4] in 88% of cases and Shiela Ethraj et al[2] in 70% of cases. Similar results of 90% were reported from the present study. The fever was continuous or intermittent in nature and most of the cases were not classically associated with chills and rigors.

Burning micturition is one of the most important clinical features of urinary tract infection specially that of the lower urinary tract. Studies done by Grag et al[1] in 24.2% and Belapurkar et al[4] in 13.6% and Shiela Ethraj et al[2] in 12% of the cases. In the present study, it was 18.3%. The higher incidence of burning micturition may be age related, as maximum number of patients in the present study was above 5 years of age, who could appreciate the symptoms.

In Grag et al[1] study, pain abdomen was noticed in 24.2% of cases. Belapurkar et al[4] reported this in 25% of

children while in the present study, this was present in 20% of cases.

The palpable bladder was noticed in 11.6% of cases with urinary tract infection in the present study and this may be due to obstruction in the urinary tract because of renal stone and in 3.3% of cases with posterior urethral valve reflux.

Belapurkar et al[4] showed loss of appetite was present in 17.2% of the cases and Shiela Ethraj et al[2] in 16% of cases. In the present study, 8.3% of cases reported this. Besides the above clinical features, the other signs and symptoms relating to urinary tract infection, we noticed in present study less than 10% of cases such as splenomegaly, phimosis, mass in abdomen, convulsions, pyuria, dribbling of urine and handling of genitalia.

Mathur and Dayal RS[6] studied a group of 63 children and have noted that colon bacilli were seen in majority of cases (84.12%) which were sensitive in order of streptomycin, furadantin, sulphadiazine, penicillin, tetracycline, synermycin and erythromycin.

Saxena and Goswami[7] studied out of 264 neonates, infants and children for asymptomatic bacteriuria with pyuria being reliable test.

Most newborn infants with urinary tract infection have nonspecific signs and symptoms. The neonates may appear septic with temperature instability of irritability or may present less acutely with poor feeding, vomiting or jaundice. The localizing signs suggesting the presence of the urinary tract infection are unusual. Because neonates do not compartmentalize infection well, most urinary tract infections in these patients are tissue invasive and there is high probability of bacterimia. In one series 31% of neonates with urinary tract infection had positive blood cultures however there was no correlation between clinical presentation and bacterimia. These findings emphasize the importance of the urinary tract as a source of neonatal sepsis and nonspecific nature of clinical findings. Diagnosis often depends on a high index of suspicion that the urinary tract infection may represent the focus of systemic disease in acutely ill neonates. In the neonatal age group there is male predominance of the condition with 2.2% of males and 0.3% of females being affected. The symptomatic urinary tract infection in the first month prevalence of 0.14% with 3 to 1 male predominance.[8]

CONCLUSION

The majority of the children in the present study were in the age group of 5-12 years. The male to female ratio was 1.3:1. Incidence of urinary tract infection was more in rural area than urban. Most of the children were from lower classes. Incidence was more in grade III malnourished children. Fever was the most common presenting symptom.

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