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## Asymptomatic urinary tract infection among school children in rural area of Ebonyi State

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### ABSTRACT

Asymptomatic Urinary tract infection (UTI) is the presence of significant number of bacteria in a clean catch mid stream urine of an individual without symptom. 600 school children comprising of 350 females and 250 males aged 4-12 from three primary schools in Onicha Local Government area of Ebonyi state were randomly selected to determine the prevalence of urinary tract infection using  $\geq 10^4$  colony forming unit per mill liter of urine as significant level of bacteria the prevalence was for a to be 48% (286). There was no significant difference between age and rate of infection ( $P > 0.05$ ), *Staphylococcus aureus* was most frequently isolated (43.6%) followed by *E. coli* (16.0%) *Klebsiella pneumoniae* (11.6%). *Enterococcus faecalis* (9.4%), coagulase negative *Staphylococcus* (8.8%) *Pseudomonas aeruginosa* (6.7) *Streptococcus pyogenes* (1.9%) and *Proteus mirabilis* (9.0%). This finding underscores the need for screening of children regularly to prevent cases of asymptomatic UTI from becoming symptomatic with consequential harm.

**Keywords:** UTI, asymptomatic bacteria, children.

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### INTRODUCTION

Urinalysis as a part of medical examination of fitness in schoolchildren is useful in detecting abnormalities that could identify early disease conditions [1]. Urinary tract infections (UTIs) are one of the most frequent bacterial infections in children [2]. At least 8% of girls and 2% of boys will have a urinary tract infection (UTI) in childhood, and between 30% and 40% will have another episode within two years [3] and it has large socio-economic impacts. It is also one of the most common infectious diseases diagnosed in outpatients as well as in hospitalized patients and can lead to significant mortality [4]. UTI in children are a significant source of morbidity, particularly when associated with abnormalities [5].

Asymptomatic bacteruria refers to the presence of bacteria in urine. It is a condition in which urine culture reveals a significant growth of pathogens that is greater than  $10^5$  bacteria/ml, but without the patient showing symptoms of urinary tract infection (UTI) [6]. The frequency and natural history of asymptomatic bacteruria vary for different populations [7]. Untreated asymptomatic bacteruria predisposes the individual to recurrent UTI which can cause renal disease [8]. Since urinary tract infection may be asymptomatic in most cases, it is therefore suggested that routine screening of patients unexplained sources of fever be done for urinary tract infection [9].

The main factor pre-disposing to urinary tract infection has been attributed to poor personal hygiene and culture habit imposition [10]. Hence Masses should be educated on the importance of personal hygiene in order to help them elevate their health status and manage themselves properly [11]. The data shown in this work is very essential to optimize the treatment and prevent the emergence of bacterial resistance, which is accountable for the rising number of therapeutic failure in various communities.

This work was conducted to investigate asymptomatic urinary tract infection among school children in rural area of Ebonyi State, Nigeria.

## MATERIALS AND METHODS

### Ethical Consideration

Ethical consideration was sought and obtained from the local health superintendent of the local government area and the head teachers of each school.

### Study Population

The urine samples from 600 school children comprising of 350 females and 250 males from three primary schools in Onicha Local Government area of Ebonyi state were randomly selected for this study. These subjects were in the age range of 4–12 years.

### Sample Collection

A total of 600 urine samples were used for this study. These urine samples were the first ‘clean catch’ midstream urine collected with sterile universal container by the children themselves after due instructions. All the container samples were labeled with identification number and samples collected analyzed within 6 hours of collection to ensure that the pathogenic organisms present in the urine were isolated and also to avoid overpopulation of the pathogenic organisms.

### Culture

Before inoculation, the samples were properly shaken to ensure even distribution of the microorganisms. The urine samples were inoculated onto Blood agar and CLED agar media and the sample plates were incubated at 37° C for 18-24 hours. The characteristic bacteria isolates observed on the selective media were aseptically isolated and subjected to microscopical and appropriate biochemical tests for proper identification [12].

### Bacteria Colony Count

Using calibrated wire loop 0.02ml of urine sample were inoculated onto solid Blood agar and CLED agar media and spread using sterile hockey stick spreader. The inoculated agar was incubated at 37°C for 24 hours after which colony count was taken after 24hours incubation.

## RESULTS

Six hundred samples collected during the study period out of which 286 (48.0%) samples showed significant bacteria growth. Also the female population had 195 (32.5%) while the male population had 91 (15%) samples with significant bacteria.

**Table 1: Prevalence occurrence of bacteria having the highest occurrence**

Age	No Examined	No (%) with significant bacteria
4-6	115	58 (50.4)
7-9	225	106 (47.1)
10-12	260	122 (47.0)
Total	600	286 (48.0)

**Table 2: Parentage occurrence of bacteria isolates**

Pathogens	Percentage (%) isolated
<i>Staphylococcus aureus</i>	43.6
<i>Escherichia coli</i>	16.0
<i>Klebsiella pneumoniae</i>	11.6
<i>Enterococcus</i> spp.	9.4
Coagulase negative <i>Staphylococcus</i>	8.8
<i>Streptococcus pyogenes</i>	6.7
<i>Proteus mirabilis</i>	1.9

## DISCUSSION

A total of 286 (48.0%) out of the 600 patients had UTI. This is line with the report of Orrett [13], who observed that 49% of patients had UTI in the study population. But contrarily to the work of Bankole *et al.* [14], who reported that a total of 204 (39.69%) out of the 514 patients sampled had UTI. Geographical location may be the reason for the difference. The finding that females had higher prevalence of UTI than males agrees with earlier studies [9,15-16]. One bacterial species was isolated from each patient, suggesting a mono-microbial nature of infection in the study population. The 286 isolates were made up of five different organisms. They are *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella pneumoniae*, *Enterococcus* spp., Coagulase negative *Staphylococcus*, *Streptococcus pyogenes* and *Proteus mirabilis* with the following frequency of occurrence 43.6%, 16.0%, 11.6%, 9.4%, 8.8%, 6.7% and 1.9% respectively. Several studies has demonstrated that the geographical variability of pathogen occurrence in cases of UTI among inpatients and outpatients populations is limited by the predominance of gram-negative species usually Enterobacteriaceae and particularly *E. coli* and *Enterobacter* spp. in various regions of the world [17-18]. *S. aureus* showed the highest prevalence of bacteria pathogen, followed by *E. coli* and *Proteus mirabilis* being the least in this study. However two recent studies in Benin City (urban settlement), Nigeria indicate *Staphylococcus aureus* as the predominant isolate in asymptomatic cases [16, 19]. But contrarily to the work of Bankole *et al.* [14] and Okonko *et al.* [20] who showed that *E. coli* is the most prevalent pathogens in symptomatic UTI patients. It is possible that the agents of symptomatic and asymptomatic UTI differ. However, this will require further investigations to verify.

Result of this study shows that 48% of the subject studied had significant bacteria which shows the prevalence rate according to age with a clear demonstration that ages 4-6 years had 50% with significant bacteria while the ages 7-9 and 10-12 had 47%. But is inconsistency with the work of Bankole *et al.* [14], who reported that the prevalence of UTI did not differ significantly within age groups in this study. Also, contrarily to the work of Orrett [13].

Female also had highest incidence of asymptomatic bacteria. The higher incidence of urinary tract infections in females might be as a result of a variety of factors, such as the close proximity of the female urethral meatus to the anus [21] and incomplete and in coordinate voiding of urine in school girls which is often associated with constipation and encourages infection of the urinary tract [22]. Alternatively, vaginal microflora also play a critical role in encouraging vaginal colonization with coliforms and this can lead to urinary tract infection [23]. Female anatomic feature also contributes to higher prevalence among the female subject. This study underscores the need for regular screening of children of bacterial infection. The toilet facilities in most public schools should be improved upon. Also health education and practice should be inculcated in children to ensure adequate and proper use of toilets and clean up after use. The role of the parent and teachers in their exercise cannot be overemphasized, the public health importance of this findings is viral policy makers in the both the health and education sector. Children represent vulnerable group that should protected from infection through intensive and regular medical checking.

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