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Infection of the Urinary Tract with Bacterial and Fungal Pathogens, Their Antibiotic Susceptibility Patterns, and Associated Risk Factors

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Introduction

One of the most frequent urinary tract system diseases in children is a Urinary Tract Infection (UTI) caused by bacteria and yeast. It is the third most prevalent infection in children under the age of five in underdeveloped nations, after respiratory and gastrointestinal tract infections. Short-term morbidity has been linked to urinary tract infection in children, including fever, dysuria, urine urgency, and flank discomfort. Long-term renal damage, such as persistent kidney scarring and long-term complications like hypertension and renal failure, are also caused by it. Renal scarring was found in roughly 15% of children after a first UTI, according to Wennerstrom et al 15, emphasising the need of early identification and treatment of UTI. In addition, the cost of healthcare-related urinary tract management is quite substantial. Many research on paediatric UTIs conducted in various developing nations found prevalence rates ranging from 16% to 34%. Furthermore, up to 8% of children aged 1 month to 11 years get at least one UTI, with up to 30% of babies and children experiencing recurring infections within the first 6–12 months after the initial UTI. UTIs can be caused by Gram-negative and Gram-positive bacteria, as well as some Candida species. UTIs are most commonly caused by E. coli, followed by K. pneumoniae. Candida species, particularly Candida albicans, are still the most common cause of candida urinary tract infections in children, according to studies. Children's age, circumcision status, and indwelling catheters are all risk factors for UTIs. Boys are more vulnerable during the first year of life, after which the prevalence is largely higher in girls due to variations in sex organs, and uncircumcised male infants are at greater risk. Uropathogen antibiotic susceptibility varies with time, geographic location, demographics, and clinical characteristics of patients.

Infectious disorders like UTIs are considered to be responsible for 26% of global mortality, with 98% of these happening in low-income countries. UTIs were found to be prevalent in 57% of paediatric patients in Nepal and 48% of pediatric patients in India, according to a study. Urinary tract infection accounted for 11% of health-care infections, according to a hospital-based research in South African children. In a separate study conducted in Kenya, urinary tract infection was shown to account for 11.9% of the burden of febrile infections in young children. A study at Hawassa referral hospital, Yekatit 12 hospital, Felege-Hiwot specialised, and Gondar University hospitals indicated 27.5%, 15.9%, 16.7%, and 26.45%, respectively, of pediatric patients with urinary tract infections. The lack of urine culture at health institutions at various levels in impoverished countries, such as Ethiopia, has remained unfeasible due to the high cost of resources. As a result, little is known about the etiological agents of UTI and their treatment susceptibility profiles in Ethiopia. The current study aims to assess the frequency of urinary tract infections, profile bacterial and fungal pathogens linked to UTI, determine the antimicrobial susceptibility profile of bacterial isolates, and identify important UTI risk variables.

Discussion

In paediatric practise, Urinary Tract Infection (UTI) is still one of the most common causes of morbidity. Early detection of UTI in children is critical because it can signal renal problems such scarring, hypertension, and end-stage renal disease. In our study, 28.6% of people had a urinary tract infection, with 21.6% caused by bacterial pathogens and 7% caused by fungal pathogens. The size of UTI attributable to bacteria in our investigation was larger than the 15.9% prevalence rate reported from Ethiopia by Merga Duffa et al, but similar to the 27.5% prevalence rate indicated by Mitiku et al in a recent study conducted in Ethiopia. As far as we know, the incidence of yeast-related UTI in Ethiopians, particularly children, remains unknown. This is because, in Ethiopia, fungal diseases are not seen as serious as bacterial and viral infections. As a result, our study's stated prevalence rate of 7% UTI caused to yeast in pediatric patients was the first in the country. The prevalence rate of yeast-caused UTI in our study was consistent with a prevalence rate of 5.2% reported by Seifi et al. in a study of youngsters. In Iran and Egypt, however, Zarei-Mahmoudabad et al and Alkilani. 27 observed prevalence rates of 16.5% and 19.0%, respectively. The increased prevalence rate in these two studies is unsurprising, given that the study subjects were all ICU patients, regardless of age. Differences in study design, socio-demographic features of study individuals, and comorbidities may have contributed to the variance in UTI prevalence rates. In the current study, 60% of UTIs were acquired in hospitals (intensive care unit and ward acquired). Although the prevalence rates of UTI in poor nations vary from study to research and from region to region, there are no regional differences in the bacterial and fungal pathogens that cause UTI, according to Aubron et al. Gram-negative bacilli with a majority of Escherichia coli and Klebsiella pneumoniae are the most prevalent bacteria obtained from urine culture. In line with previous research, E. coli was shown to be the most common bacterium, accounting for 42.9% of all bacterial isolates, followed by K. pneumoniae, which accounted for 34.6% of all bacterial isolates. In both community and hospital-acquired UTIs, E. coli was the most common bacterial pathogen (57.1% and 42.9%, respectively). Candida species cause at least 10–15% of hospital-acquired UTIs, according to multiple studies, and candiduria is particularly common in intensive care units. Candidauria accounted for 7% of UTIs in our study, and 94% of them were acquired in hospitals, with 62.5% occurring in ICU patients. Candida albicans was the most common cause of candiduria, with 81.1% of candida species identified from ward- and ICU-acquired positive urine culture samples. Given that candida species are opportunistic infections that cause illness in immune-compromised patients such as ICU patients, our findings are not surprising.

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