PREVALENCE OF MICROORGANISMS CAUSING UTI IN PATIENTS ATTENDING MICROBIOLOGY LABORATORY OF KHYBER MEDICAL COLLEGE, PESHAWAR DURING THE YEAR 2013

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ABSTRACT

Objectives: To have an updated knowledge and periodic monitoring of the most common organisms causing UTI from time to time.

Materials and Methods: This study was carried out in the Microbiology laboratory of Pathology Department, Khyber Medical College Peshawar. A total of 95 patients with signs and symptoms of urinary tract infection were recruited for this study. Exclusion criteria included antibiotic usage within three days and large fluid intake (less than one hour) before clinic attendance. Clean–catch midstream urine was collected from each patient into sterile broad mouthed container. Ten ml of urine sample was centrifuged at 2000g for 5 minutes. The supernatant was discarded and a drop of the deposit was examined microscopically at high magnification for pus cells red blood cells, epithelial cells, cast, and crystal.

Results: A total of 95 patients of UTI attended the Microbiology laboratory. Out of these 58 (61.1%) were female and 37 (38.9%) were male. *Escherichia coli* was found to be the most predominant organism (isolate) causing UTI in this study. This was followed by *Pseudomonas* (7.4%), *Citrobacter* (3.2%), *Staphyllococcus* (3.2) and mixed by *Escherichia coli* and *Pseudomonas* (3.2%).

Conclusion: *Escherichia coli* were the predominant isolates causing UTI with female to male ratio of 2:1.

INTRODUCTION

The second most common type of infection in humans is urinary tract infection[1]. It occurs in all age groups, and usually requires urgent treatment[2]. It is a leading cause of healthcare expenditure in the advanced countries including USA[3]. Women are significantly more likely to experience UTIs than men are; almost half of all women will experience a UTI during their lifetime. More than 80% of UTIs in outpatients are caused by Escherichia coli[4,5]. Other typical causative organisms are Pseudomonas aeruginosa, Klebsiella pneumoniae, Proteus mirabilis, Staphyllococcus aureus, Enterococcus faecium, and Enterococcus faeca[6]. Few authors have reported changing patterns in the prevalence of uropathogens[7,8]. Therefore, there is need to have an updated knowledge and periodic monitoring of the organisms causing UTI from time to time. Etiology of UTI is influenced by factors like age, urinary catheterization and other ones[9]. Patients are diagnosed as having a UTI based on symptoms and laboratory tests. Pathogen detection tests include urine dipstick testing, urinalysis, microscopy, Gram staining, and urine culture.

Although urine culture has therapeutic implications, allowing both UTI diagnosis and antibiotic susceptibility testing, it is also associated with three intrinsic disadvantages. First, urine culture is laborious and requires special training to perform, which hampers its diagnostic use in community hospitals. Second, it is time-consuming and, especially in the event of sample contamination, can delay the diagnosis and treatment of suspected UTI patients. Third, since the sign or symptoms of UTI are not necessarily specific, many samples from suspected UTI patients ultimately test negative for bacteria, but still require time and resources to process and increases costs for clinical microbiology laboratories; Therefore, it is important to improve the conventional urine microscopy especially for all of the uncomplicated UTI cases because it is easily performed, rapid, and economical.

MATERIALS AND METHODS

This study was carried out in the Microbiology laboratory of Pathology Department, Khyber Medical College Peshawar. A total of 95 patients with signs and symptoms of urinary tract infection were recruited for

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this study. They consisted of 58 females, and 37 males, with age ranging from 04 to 79 years. Exclusion criteria included antibiotic usage within three days and large fluid intake (less than one hour) before clinic attendance. Verbal informed consent was obtained from all patients or their parents in case of children prior to specimen collection. Clean–catch mid stream urine (MSU) was collected from each patient into sterile broad mouthed container. Ten ml of urine sample was centrifuged at 2000g for 5 minutes. The supernatant was discarded and a drop of the deposit was examined microscopically at high magnification for pus cells red blood cells, epithelial cells, cast, crystal, yeast-like cells and *Trichomonas vaginalis.* Pus cells > 5 per high power field were considered significant to indicate infection. Urinary tract infection was diagnosed, if the bacteria or pus cell count, or both were significant in an individual. The isolates were identified by standard microbiological method[10].

RESULTS

During the period starting from 1st March 2013 to 31st December 2013, a total of 95 patients of UTI attended the Microbiology laboratory of Pathology Department, Khyber Medical College Peshawar. Out of these 58 (61.1%) were female and 37 (38.9%) were male. Highest prevalence was recorded for the age within 25 – 30 years. Escherichia coli was found to be the most predominant organism (isolate) causing UTI in this study. This was followed by Pseudomonas (7.4%), Citrobacter (3.2%), Staphyllococcus (3.2) and mixed by Escherichia coli and Pseudomonas (3.2%). Other organisms were Enterobacterae, Marginella morganni and Proteus.

Table 1

Age in years	Female	Male
04-10	12	01
11-20	09	07
21-30	14	06
31-40	05	06
41-50	07	04
51-60	07	05
61-70	05	06
>70	00	01

Table 2

Organisms	Females	Males
Escherichia coli	49	24
Pseudomonas	01	05
Citrobacter	01	02
Staphylococcus	--	01
Marginella	02	--
Enterobacter	02	01
Proteus	01	--
mixed	05	02

DISCUSSIONS

This study aimed at determining the prevalence of UTI, the effect of gender and age on its prevalence, as well as the etiologic agents. The finding that females had higher prevalence of UTI than males agrees with earlier studies[8,11,12]. The high prevalence in females are due to close proximity of the female urethral meatus to the anus, shorter urethra, and sexual intercourse have been reported as factors that influences this higher prevalence in women[7]. Although age range of 25-30 years had highest prevalence of UTI, consistent with Orett; however, it did significantly differ from other groups in this study.

The predominant isolate causing UTI in this study was Escherichia coli. This was also reported by earlier studies like[6,11,12,13]. However two recent studies showed Staphylococcus aureus as predominant isolate[7,8]. As compared to this study asymptomatic subjects were included in these studies. It is possible that the pathogens of symptomatic and asymptomatic UTI differ.

Escherichia coli is a Gram-negative bacillus that is found in the GastroIntestinal tract (GIT) of all humans. The strains and serotypes of Escherichia coli that are part of the indigenous microflora of the GIT are opportunistic pathogens. They usually cause no harm while in the GIT, but have the potential to cause serious infections if they gain access to the bloodstream, the urinary bladder, or a wound. Escherichia coli is the major cause of septicemia, urinary tract infections, and nosocomial infections.

CONCLUSION

Females had a two fold increase risk of acquiring UTI than males. Escherichia coli were the predominant isolates causing UTI with female to male ratio of 2:1.

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