INTRODUCTION

Among the most common infectious diseases, urinary tract infections (UTIs) are commonly encountered diseases by clinicians in developing countries with an estimated annual global incidence of at least 250 million.¹² It has been estimated that globally symptomatic UTIs result in as many as 7 million visits to outpatient clinics, 1 million visits to emergency departments, and 100,000 hospitalizations annually.³ In fact, UTIs are associated with a high risk of morbidity and mortality especially in the elderly.⁴

Urine in the human bladder is normally sterile. UTIs refer to the presence of microbial pathogens within the urinary tract and it is usually classified by the infection site: bladder (cystitis), kidney (pyelonephritis), or urine (bacteriuria). Bacteriuria may be asymptomatic or show apparent symptoms of urinary tract infection⁵,⁶ like dysuria, suprapubic pain and fever. The common uropathogens identified in adult patients with UTIs include enteric gram-negative bacteria, with E. coli being the most common. The remainders of infections are caused by coagulase-negative Staphylococcus saprophyticus (10-20%), while Proteus mirabilis, Klebsiella, and Enterococcus account for less than 5%.⁷,⁸ Other aerobic gram-negative bacteria of the Enterobacteriacea family include Citrobacter, Enterobacter, Serratia, and Salmonella.⁹,¹⁰ In complicated urinary tract infections and hospitalized patients, organisms such as Enterococcus faecalis and highly resistant Gram-negative rods including Pseudomonas spp. are comparatively more common.

UTI is one of the most common infections occurring in all the age groups from neonates to old age. It is more common in females as compared to males, especially females of reproductive age group (from 15-50 years).⁸ This is due to anatomical pre-
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disposition, close approximation of urethra and vagina and sexually active life during these years.11 UTI is also an important complication of pregnancy. The relative frequency of the pathogens varies depending upon age, sex, catheterization, and hospitalization.12 This study was conducted to determine the frequency of uropathogens in relation to age and gender in District D.I. Khan.

MATERIAL AND METHODS

This cross sectional study was conducted at the Department of Urology DHQ Teaching Hospital, D.I. Khan from February 2012 to January 2013. All patients whose routine urine examination revealed numerous pus cells on microscopy were included in this study. The midstream urine specimens were collected in sterile containers and were processed for culture within 30 minutes of collection. With standard calibrated loop, 1μl of urine was inoculated on Cysteine Lactose Electrolyte Deficient (CLED) agar and blood agar and incubated aerobically at 37°C for 18-24 hrs. Inoculation from well-mixed specimen was performed first, followed by other procedures. After the incubation, if the CFU was more than 10⁵, it was considered significant bacteriuria.

Table 1: Age group distribution of patients with Urinary Tract Infections (n=44).

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Age groups in years</th>
<th>Frequency (number)</th>
<th>Relative frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1-20</td>
<td>09</td>
<td>20.45</td>
</tr>
<tr>
<td>2</td>
<td>21-40</td>
<td>17</td>
<td>38.63</td>
</tr>
<tr>
<td>3</td>
<td>41-60</td>
<td>10</td>
<td>22.72</td>
</tr>
<tr>
<td>4</td>
<td>&gt; 60</td>
<td>08</td>
<td>18.20</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td></td>
<td>100 %</td>
</tr>
</tbody>
</table>

Table 2: Frequency of Uropathogens in patients with Urinary Tract Infections (n=44).

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Uropathogens</th>
<th>Frequency (number)</th>
<th>Relative frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>E.coli</td>
<td>25</td>
<td>56.82</td>
</tr>
<tr>
<td>2</td>
<td>Klebsella spp.</td>
<td>07</td>
<td>15.90</td>
</tr>
<tr>
<td>3</td>
<td>Pseudomonas spp.</td>
<td>03</td>
<td>6.82</td>
</tr>
<tr>
<td>4</td>
<td>Staphylococcus aureus</td>
<td>03</td>
<td>6.82</td>
</tr>
<tr>
<td>5</td>
<td>Enterococcus spp.</td>
<td>02</td>
<td>4.55</td>
</tr>
<tr>
<td>6</td>
<td>Candida spp.</td>
<td>02</td>
<td>4.55</td>
</tr>
<tr>
<td>7</td>
<td>Enterobacter spp.</td>
<td>01</td>
<td>2.27</td>
</tr>
<tr>
<td>8</td>
<td>Streptococcus spp.</td>
<td>01</td>
<td>2.27</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>44</td>
<td>100 %</td>
</tr>
</tbody>
</table>

were demographic variables. Culture of microorganisms was a research variable. Age grouping was done as follows: 1-20 years, 21-40 years, 41-60 years and more than 60 years. Age in years was analyzed as mean and range. Gender, age grouping and culture were analyzed as frequency (number) and relative frequency (%).

RESULTS

A total number of 44 UTI cases diagnosed on urine culture were included in this study. Out of these cases 10 (22.8%) were male and 34 (77.2%) were females. The mean age was 39 (1-80) years. Majority of UTI cases were found in age group 21-40 years (38.83%). (Table 1)

The culture reports revealed E. coli as the leading uropathogen in 56.82% cases, followed by klebsella spp. 15.90%, Pseudomonos spp. and Staphylococcus aureus were 6.82% while Enterococcus spp. and Candida spp. were 4.55%. Enterobacter spp. and Streptococcus spp. were 2.27% respectively. (Table 2)

DISCUSSION

Urinary tract infection is one of the most common types of infectious diseases encountered in the practice of medicine these days. A total of 44 urine specimens of patients aged 1-80 years, suspected for urinary tract infection were processed for culture. According to our study the UTI was more common in females (77.20%) than males (22.80%). This is similar with studies conducted by Mohammad Tariq Mehr, where gender distribution was 62.6% for females as compared to 37.31% for males. Another study conducted by Anisur Rehman revealed 9.6% males and 90.4% females.13,14 It is more common in females due to anatomical predisposition, close approximation of urethra and vagina and sexually
active life during these years. Women may be more susceptible to UTIs because their urethral opening is near the source of bacteria (e.g., anus, vagina) and their urethra is shorter, providing bacteria easier access to the bladder. 50-80% women experience urinary tract infection at least once or twice in their lives. UTI is also an important complication of pregnancy due to the pressure of gravid uterus on the ureters resulting in the stasis of urine flow and due to the humoral and immunological changes during normal pregnancy.

In our study the prevalence of UTIs was highest for age group of 21 to 40 years (38.63%) followed by 41-60 years (22.72%). It was less common in age group below 21 (20.45%) and above 60 years (18.20%). According to analysis of a random digit dialing survey of 2000 women in the United States by Foxman B et al., one-third of women will have at least one physician-diagnosed UTI treated with prescription medication by age 24 and above. Overall, an estimated 11.3 million women in the United States had at least one presumed UTI treated with antibiotics with annual cost of UTI cases $1.6 billion in 1995 which will exceed to $25.5 billion in next 20 years.

In our study *E. coli* was the commonest cause of urinary tract infection (56.82%) followed by *Klebsiella pneumoniae* (15.90%), *Staphylococcus aureus* (6.82%), *Pseudomonas spp.* (6.82%) *Enterococcus spp.* (4.55%) *Candida spp.* (4.55%), *Enterobacter spp.* (2.27%) and *Streptococcus spp.* (2.27%) respectively. This is similar to other studies where *E.coli* was the most frequent pathogen causing UTI, as in a study conducted by Mohammad MT, where 62.6% cultures grew *E.coli* and in a study by Naeem et al, he found 66% *E.coli* cases while Tabish reported 70% *E.coli* positive culture cases. These results were also similar with a study conducted by Dilnawaz S et al, which reflects that first two common organisms were *E. coli* and *Klebsiella pneumoniae*. Third prevalent organism in our study was *Pseudomonas* while in the above mentioned study it was also *Pseudomonas*.

In two other studies in Pakistan, Khan, reported an uropathogens prevalence of 45.6% for *E. coli*. This was followed by *Candida spp.* (10.5%), *Enterococcus spp.* (10.2%) while Farooqi revealed a prevalence of 42% for *E. coli*, 16% *Pseudomonas aeruginosa*, 11% *Klebsiella aerogenes*, 5.0% *Enterobacter spp.*, 13% *Proteus spp.*, 4.0% *Serratia liquifaciens*, 1.0%, *Acinetobacter spp.*, 3.0% *Citrobacter spp.*, 4.0% *Enterococci* and 0.5% *Staphylococcus aureus*. Prevalence of different pathogens is dependent on several population attributes, sample size and hygienic conditions of the patients. Therefore, a stable pattern in this regard cannot be predicted. This is why data vary when different studies are compared. For example, Hsueh et al. have reported that the most frequent isolates from UTIs at a university hospital in Taiwan during the period 1993 - 1998 were *Candida spp.* (23.6%), *E.coli* (18.6%) and *Pseudomonas* (11.0%). However later on *E.coli* (18.4%) replaced *Candida spp.* (14.3%) as the top ranking pathogen causing UTIs.

**CONCLUSION**

The most common uropathogen was *E.coli*. Higher prevalence of UTIs was observed in female population. The prevalence of UTIs was highest for age group of 21 to 40 years.

**REFERENCES**

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CONFLICT OF INTEREST
Authors declare no conflict of interest.

GRANT SUPPORT AND FINANCIAL DISCLOSURE
None declared