Urinary tract infections (UTI) represent serious threats to human health all around the world affecting millions of people each year (Reed and Kemmerly, 2009). These are the most common nosocomial as well as community acquired infections, resulting in high morbidity and increased economic loss in terms of treatment (Ojo and Anibijuwon, 2010). UTIs are widespread in both males and females; nevertheless, females are more susceptible than males (Mobsin and Siddiqui, 2010; McGregor et al., 2013). In early childhood, persistent urinary tract infections may usually emerge and 1 to 8% of children may experience UTI at least once between the age of 1 and 11 years (Koljalg et al., 2009).

The causative agents of UTI may include bacteria, virus and fungi (Ojo and Anibijuwon, 2010). Of these, gram negative bacilli are the most prevalent uropathogens. This study was evaluated statistically using Fisher’s exact test. For proportion comparison between two groups of patients, two tailed p value < 0.05 was considered statistically significant.

Out of one hundred urine samples, seventy one samples were found positive for bacterial growth. Among 71 positive samples, 46 (65%) were of female patients and 25 (35%) urine samples were of male patients. On the basis of colony morphology, bacterial pathogens were isolated from urine samples on Cysteine Lactose Electrolyte Deficient (CLED) agar (Merck, Darmstadt, Germany) and these isolated colonies were further purified on MacConkey agar (Merck, Darmstadt, Germany). Bacteria having different colony morphology from each other were further identified by different biochemical tests and results were interpreted using the guidelines of Clinical and Laboratory Standards Institute 2012 (CLSI, 2012).

All isolated bacterial pathogens were subjected for susceptibility testing for most commonly used antimicrobial agents in case of urinary tract infections. These include ampicillin (10µg), aztreonam (30µg) (β lactam), cephalexin (30µg) (cephalosporin), vancomycin (30µg) (glycopeptide) and amikacin (30µg) (aminoglycoside). For antibiotic sensitivity test, Disc Diffusion Test was conducted on Muller Hinton Agar (Merck, Darmstadt, Germany) using antibiotics on paper discs (Oxoid, Hampshire, UK); zone of inhibition were measured and results were interpreted according to guidelines of Clinical and Laboratory Standards Institute 2012 (CLSI, 2012).

Data obtained in this study was evaluated statistically using Fisher's exact test. For proportion comparison between two groups of patients, two tailed p value < 0.05 was considered statistically significant.

Out of one hundred urine samples, seventy one samples were found positive for bacterial growth. Among 71 positive samples, 46 (65%) were of female patients and 25 (35%) urine samples were of male patients. On the basis of biochemical testing, four
types of bacterial populations were identified; the distribution of these bacterial isolates is shown in Table 2.

Table 1: Proportion of urine samples from different hospitals

<table>
<thead>
<tr>
<th>Gender</th>
<th>JH</th>
<th>IH</th>
<th>SZH</th>
<th>LGH</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>21</td>
<td>16</td>
<td>6</td>
<td>7</td>
<td>50</td>
</tr>
<tr>
<td>Female</td>
<td>9</td>
<td>6</td>
<td>22</td>
<td>13</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>22</td>
<td>28</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

More than 50% samples were found positive for E. coli following by P. aeruginosa (20%), K. pneumoniae (17%) and Pr. mirabilis (13%). Statistically, no significant difference of prevalence of bacterial isolates was observed between two groups of patients (male and female) of all hospitals. Bacterial pathogens isolated from patients with UTI expressed high resistance versus antibiotics tested in this study. All of them showed resistance to vancomycin and ampicillin whereas amikacin was able to retain excellent activity against these pathogens. However, 73% of E. coli, 66% of Pr. mirabilis, 34% of P. aeruginosa and 28% of K. pneumoniae isolates were found resistant to amikacin. Similarly, cephalaxin was found sensitive for all of P. aeruginosa, 67% of Pr. mirabilis, 34% of K. pneumoniae and 31% of E. coli isolates. Detailed results of antimicrobial resistance pattern by disc diffusion method are shown in Table 2.

Table 2: Prevalence and percentage of antimicrobial resistance in bacteria

<table>
<thead>
<tr>
<th>Isolates</th>
<th>Distribution of isolates</th>
<th>Antimicrobial resistance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male (n=25) (%)</td>
<td>Female (n=46) (%)</td>
</tr>
<tr>
<td>Escherichia coli (n = 36)</td>
<td>13 (32)</td>
<td>23 (50)</td>
</tr>
<tr>
<td>Klebsiella pneumonia (n = 12)</td>
<td>5 (20)</td>
<td>7 (15)</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa (n = 4)</td>
<td>4 (16)</td>
<td>10 (21)</td>
</tr>
<tr>
<td>Proteus mirabilis (n = 9)</td>
<td>3 (12)</td>
<td>6 (13)</td>
</tr>
</tbody>
</table>

AK - Amikacin, AZ - Aztreonam, CF - Cephalexin, AM - Ampicillin, VN - Vancomycin

Among all the suspected patients for urinary tract infections, E. coli was found as the most prevalent bacteria in all hospitals. The prevalence of E. coli isolates was parallel to what has been reported in previous studies from Poland and Iran. More than 50% prevalence of E. coli isolates among UTI suspected patients in present study was slightly higher than the previous report from Poland and Iran where the prevalence had been found 39% and 44%, respectively (Hryniewicz et al., 2001; Behzadi et al., 2010). In comparison to previous studies from Portugal and Iran, slightly higher prevalence of K. pneumoniae (13% and 10% vs 17%) and P. aeruginosa (5% vs 20%) was found from different hospitals of Lahore City, whereas, the occurrence of Pr. mirabilis (13%) in UTIs from Portugal and Lahore City was similar to each other (Kalra and Raiizada, 2009; Behzadi et al., 2010). The prevalence of E. coli, P. aeruginosa and Pr. mirabilis in Lahore City was almost similar to findings of previous study from Rawalpindi, Pakistan, however the occurrence of K. pneumoniae (17%) isolates contributing UTIs in this study was higher than the previous where it was reported about 8% (Mahboob et al., 2011).

The situation of antimicrobial potency of commonly used antibiotics in different hospitals included in the current study was alarming as most of the isolates were resistant to the antibiotics which were used in case of UTI. However, amikacin still could be used as a drug of choice in such cases. Absence of resistance against amikacin in UTI bacteria isolated from different hospitals of Lahore City contradicted the previous reports where emergence of resistance against amikacin had been recorded in neighboring country India (Eshwarappa et al., 2011). On the other hand, emergence of resistance against most of the antimicrobial agents used in several hospitals could be reasoned due to their indiscriminate prescription.

Conclusively, this study shows the prevalence of gram negative bacteria in most of urinary tract infections in several hospitals of Lahore City and emergence of antimicrobial resistance against most of the antimicrobial agents is appearing as a foremost object of letdown of therapeutics in hospitals.

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CONFLICT OF INTEREST

None to declare.

REFERENCES


