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Original Research Article

Assessment of Patients Profile and Antibiotic Prescribing Trends for Urinary Tract Infection in a Small Private Hospital of Nepal

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ABSTRACT

Urinary Tract infection (UTI) is one of the most important causes of morbidity and also the common cause of hospital visit. The study aims to assess socio-demographic and clinical profile of the urinary tract infected patients as well as antibiotic prescribing trend for its treatment in a small private hospital of Nepal. A hospital based prospective observational study was conducted for the period of four months. A total of 91 patients were enrolled, male patients were 22 (24%) and female patients were 69 (76%). UTI is more prevalent in age ranges between 16-25 years (47.25%), married females were mostly affected with UTI (76.81%). Majority of patients had uncomplicated UTI 64(70.33%). The most common symptoms were fever 29%, dysuria/burning micturition 22% and lower abdominal pain 20%. Cefpodoxime was mostly prescribed drugs relating to 36 (39.56%) UTI cases followed by Cefixime 21(23.08%) and Ceftriaxone 14(15.38%). The study concludes that UTI is more common among females than males. Pregnancy, post-menopausal, OCP users, renal stones and hydronephrosis are the predisposing factors of UTI among females. Cephalosporins are the most commonly prescribed antibiotics for UTI followed by fluoroquinolones and nitrofurantoins.

Key words: Urinary tract infection, antibiotics, predisposing factors, UTI symptoms, prescribing trends

INTRODUCTION

Urinary tract infections (UTIs) are the most frequent bacterial infection especially in women. [1] They occur most frequently between the ages of 16 and 35 years, with 10% of women getting an infection yearly and 60% having an infection at some point in their lives. [2,3] Recurrences are common, with nearly half of people getting a second infection within a year. Urinary tract infections occur four times more frequently in females than males. [3] The majority of these are simple UTI, also known as acute uncomplicated cystitis. Pyelonephritis occurs between 20–30 times less frequently. [1] They are the most common cause of hospital acquired infections accounting for approximately 40%. [4] UTI most commonly affects young sexually active women and accounts for more than 8 million physician visit per year in USA. [5] With an estimated cost of 92-120 dollars per treated infection, UTIs confers an economic burden of nearly 1 billion dollar to the health care system annually. In addition, UTIs are associated with significant morbidity, with each episode estimated to result in 6 symptom days, and approximately 1 day lost from work. [6] Nepal being a developing country it has

about 61.4% people illiterate who are not aware on health matters and hygienic living habit, so are always in the threat to infections by various organisms. [7] According to annual report of fiscal year (2055/2056) published by Department of Health Services, 0.46% of total outdoor patients suffered from UTI. [8] Thus, appropriate management of this common infection is essential. Excessive and inappropriate use of antibiotics in hospitals, health care facilities and the community also contributes to the development of bacterial resistance. For a constructive approach to problems that arise from the multiple antibiotics available, information about antibiotic use pattern is necessary. [9] Prescribing pattern studies in UTI can provide useful information for the improvement of appropriate and effectiveness use of antibiotics in a hospital. The assessment of the prescription will help to know the attitude of the physicians towards their prescribing and therapeutic knowledge to ensure rationality in the prescription.

MATERIALS AND METHODS

This was a hospital based prospective, observational study conducted at the pharmacy unit of private hospital between September 2014 to February 2015. The study was carried out at Navajeevan Hospital Pvt. Ltd. of Dhangadhi, Kailali district. Navajeevan Hospital is the first private hospital of Far-Western development region, initiated from 15 bedded services, and has extended it to 50 bedded services now. From the time of establishment Navajeevan Hospital is continuously giving its medical and diagnostic services to not only the people of Dhangadhi but also to the patients visiting from remote areas of Kailali district and also from other districts of Far-Western regions.

All inpatients and outpatients of aged above 15 years clinically diagnosed with Urinary tract infection and those who were prescribed with antibiotics were included in the study. We excluded patients who have multiple co-morbidity and those who did not give their consent freely. Research proposal was approved by department of pharmacy, Sunsari Technical College, Dharan. Institution permission was obtained through letter written to hospital administration explaining the goals and objective of research and asking permission to collect data. Participants were informed that the research was strictly for academic purposes and participant rights to confidentiality and freedom from harm were ensured. Relevant data and information were collected through prescription, laboratory urine reports and interviewing the patients in a suitable design patient's data collection form. The dully filled form contain patient demographic record, department visited, chief complains, medical history, medication history, physical examination, urinalysis, diagnosis and prescribed antibiotic. Collected data was analyzed on MS Excel and descriptive statistic was used for analyzing the results of study.

RESULTS

The total of 91 patients was studied. Male patients were 22 (24%) and female patients were 69 (76%) in which 14 (15.38%) were inpatients and 77 (84.62%) were out patients. The study found that the UTI is more prevalent in age ranges between 16-25 years (47.25%), followed by age ranges between 26-35 years (30.77%) as shown in table 1. Further, married females (N=63) were mostly affected with UTI (76.81%) in comparison to unmarried females 16 (23.19%) as shown in table 2. In our study, 64(70.33%) patients were found to have uncomplicated UTI, distribution profile concerning predisposing factors and symptoms were shown in table 3 and table 4 whereas Distribution of pus cells and epithelial cells through urinalysis is shown in table 5 and table 6

Table 1: Age Wise Distribution

	Male		Female		Total	
Age (years)	**N**	**%**	**N**	**%**	**N**	**%**
16-25	12	54.55	31	44.93	43	47.25
26-35	6	27.27	22	31.88	28	30.77
36-45	1	4.54	9	13.04	10	10.99
46-55	2	9.09	5	7.25	7	7.69
>56	1	4.55	2	2.90	3	3.30
Total	22	100	69	100	91	100

Table 2: Marital Status Wise Distribution

	Male		Female	
Marital status	**N**	**%**	**N**	**%**
Married	10	45.45	63	76.81
Unmarried	12	54.55	16	23.19
Total	22	100	69	100

Table 3: Distribution of Predisposing Factors

	Male		Female		Total	
Predisposing factors	**N**	**%**	**N**	**%**	**N**	**%**
Uncomplicated	18	81.82	46	66.67	64	70.33
Pregnancy	0	0	9	13.04	9	9.89
OCP/contraception	0	0	7	10.14	7	7.69
Post menopauses	0	0	5	7.25	5	5.49
Renal stones	4	18.18	1	1.45	5	5.49
Hydronephrosis	0	0	1	1.45	1	1.11
Total	22	100	69	100	91	100

Table 4: Symptoms Wise Distribution

	Male		Female		Total	
Symptoms	**N**	**%**	**N**	**%**	**N**	**%**
Fever	10	35	31	27	41	29
Flank pain	8	28	5	4	13	9
Dysuria/Burning micturation	4	14	28	25	32	22
Frequent urination/ urge to urinate	1	3	9	8	10	7
Lower abdominal pain	3	10	25	22	28	20
Lower back pain	0	0	6	5	6	4
Others	3	10	10	9	13	9

Note: The symptoms here are overlapping with each other that's why value of N is > total no of cases.

Table 5: Urinalysis: Distribution of Pus Cells

Pus cells/ HPF	**Male**		**Female**		**Total**	
	N	**%**	**N**	**%**	**N**	**%**
1-5	6	27.27	20	28.99	26	28.57
6-10	8	36.36	32	46.38	40	43.96
11-15	3	13.64	7	10.14	10	10.99
Plenty	5	22.73	10	14.49	15	16.48
Total	22	100	69	100	91	100

Table 6: Urinalysis: Distribution of Epithelial Cells

	Male		Female		Total	
Epithelial cells/HPF	**N**	**%**	**N**	**%**	**N**	**%**
1 to 5	7	31.82	18	26.09	25	27.47
6 to 10	13	59.09	38	55.07	51	56.05
11 to 15	2	9.09	12	17.39	14	15.38
Plenty	0	0	1	1.45	1	1.10
Total	22	100	69	100	91	100

In the analysis of prescribing pattern, overall 7 antibiotics were prescribed for UTI. Among the 91 patients Cefpodoxime was prescribed to 36(39.56%) patients followed by Cefixime 21(23.08%) and ceftriaxone 14(15.38%) patients whereas quinolones group of antibiotics were prescribed comparatively less as shown in table 7.

Table 7: Distribution of Prescribing Pattern of Antibiotics

	Male	Female	Total	
Antibiotics	**N**	**N**	**N**	**%**
Cefixime	1	20	21	23.08
Cefpodoxime	13	23	36	39.56
Ceftriaxone	5	9	14	15.38
Cefuroxime	0	2	2	2.20
Ciprofloxacin	3	1	4	4.40
Nitrofurantin	0	9	9	9.89
Ofloxacin	0	5	5	5.49
Total	22	69	91	100

DISCUSSION

This is well known that UTI is more common among females which is also proved by many authors in their research studies. [10-13] In this study, 76% were female patients while only 24% were male patients. The anatomy of the female urethra is of particular importance to the pathogenesis of UTI. The female urethra is relatively short compare to male urethra and also lies in close proximity to the warm, moist, perirectal region, which is teeming with microorganisms. Because of the shorter urethra, bacteria can reach the bladder more easily in the female host. [14]

Infection of urinary tract is amongst the most common bacterial infections that forced patients to seek medical advice, second only to infection of respiratory tract. It has been estimated that about six million patients visit outpatient departments and about 300,000 are treated in the wards (inpatients) every year for UTI worldwide. [14] In our study, most of the patients were out- patients (84.62%). The result somewhat matched with the result mentioned by Mishra et al and Mahadevamma et al in their literatures. [12,13] The reason may be, most of the UTI cases are not so serious, they are treated with oral antibiotics, so are not require for admission and the doctors often ask for the follow-up after 5-7 days to evaluate the outcome of therapy. Some

cases may require parenteral antibiotics so need to be stay at hospital (in-patients).

Among female patients, most of patients were of aged between 16-35 years had UTI. This is an agreement with the findings of Thapa et al as their study showed the age range of 21-30 years had highest prevalence of UTI. [15] However this result contradicts with the results obtained by Arul PKC et al and Mishra R et al which show the higher prevalence observed in the age group of 31-50. [10,12] In this study, we observed that among female populations there is decrease in incidence of UTI with increase in per decade of life. This might be due to reason that factors such altered menstrual status, hormonal changes, sexual activity, contraceptive use and pregnancy in female in reproductive age groups may contribute to increased incidence of UTI.

Our study shows that incidence of UTI in married female is relatively higher (76.81%) in comparison to unmarried female (23.19%), almost same results obtained by Arul PKC et al which show 73.5% of married patients have UTI. [10] This may be due to frequent sexual activity which is the common risk factor among young sexually active females. [2]

In the study, 70.33% patients have uncomplicated UTI i.e. have normal genitourinary tract without any underlying disease (Sr. FRT, 2008). [9] or any metabolic/hormonal abnormalities (John B et al). [16] In this study, 9.89% were pregnant woman followed by OCP/Contraceptive users (7.69%), renal stones (5.49%), post menopausal woman (5.49%) and hydronephrosis (1.11%) which are considered as predisposing factors for UTI. Altered hormonal level in pregnancy, post menopausal and OCP users causes changes in normal functioning of urinary tract that make it more vulnerable to infection. Kidney stones or other obstructions in urinary tracts can trap urine in bladder and increases the risk of UTI. In our study, pregnancy was the predominant factor for UTI other than uncomplicated UTI and no any cases of diabetes was reported, which totally deviate from the study performed by Arul PKC et al which show diabetes (21%) as predominant factor for UTI and pregnancy constitute 10.5% of total cases reported. [10] In this study, males were only associated with renal stones as predisposing factors other than uncomplicated cases.

As per classical symptoms of UTIs mentioned by Tze Shien Lo et al in the literature, [17] many of similar symptoms were observed in our study viz. fever, dysuria, flank pain, abdominal pain, lower back pain, frequent urination and others like nausea, dizziness etc. Most of the patients presented with fever (29%) followed by dysuria (22%) while Arul KCP et al and Mishra R et al in their study reported that most of the patients were presented with Dysuria followed by fever. [10,12] In our study most of the females were presented with dysuria and lower abdominal pain apart from fever, this may indicate the possible etiology of cystitis(bladder infection) while most of the male presented with symptoms like fever and flank pain which may indicate possible etiology of pyelonephritis.

Pus is a whitish or yellowish or slightly green substance which is thick like glue. Pus in urine signifies that the body is fighting an infection in the lower urinary tract. Pus contains dead skin cells, bacteria and white blood cells. The medical term for the pus in urine condition is known as pyuria and is a common symptom for various medical conditions. The most common reason for pyuria is the existence of UTI (Sharib, 2013). [18] Oladeinde et al in their study supported that pus cells ≥ 5 per HPF were considered significant to indicate infection. [19] In my study most of the cases showed distribution of pus cells was ≥ 5.

The tissue that lines the surfaces of cavities and structures in the body is called epithelial tissue. In healthy individuals, epithelial cells from the bladder and external urethra are normally present in urine in small amounts. However, the amount of epithelial cells in urine increases when someone has a UTI or some other cause of inflammation. [20] In this study, we observed

72.53% of total cases had epithelial cells distribution of more than 5/HPF. Saimary et al believed that the cytological examination of urine i.e. pus cells, epithelial cells, RBCs etc is a significant tool in the diagnosis of UTI because a strong relationship exists between positive results of the cytological and bacteriological studies. [21]

In our study, most frequently prescribed antibiotics were Cephalosporins (79.12%) (cefpodoxime, cefixime, ceftriaxone and cefuroxime) followed by equally with Fluoroquinolones (9.89%) (ciprofloxacin and ofloxacin) and Nitrofurantoin (9.89%). Same results was observed by Mahadevamma L et al, that the cephalosporin were most commonly used and fluoroquinolones were second most commonly used antibiotics for the treatment of UTI. [13] Quite similar to this study, Neto et al states that fluoroquinolones remains the choice among orally administered antibiotics, followed by nitrofurantoin, second and third generation cephalosporin. [11]

We observed that all the in-patients (N=14) were prescribed with injection Ceftriaxone (100%). This result supports the conclusion made by Neto et al., that for severe disease that required parenteral antibiotics the choice should be aminoglycosides, third generation cephalosporin, fluoroquinolones or imipenem, which were the most effective. [11] Among the out-patients (N=77) most of them were prescribed with cefpodoxime (46.75%). Out of 9 pregnant woman, 8(88.89%) of them were prescribed with Nitrofurantoin. The result supported the examination made by Delzell et al. [22] which states that the antibiotic should be safe for mother and fetus. Historically, ampicillin has been the drug of choice, but in recent years E.coli has become increasingly resistant to ampicillin. Nitrofurantoin is a good choice because of its higher urine concentration and safe drug in pregnancy. [17]

Among 18 females visiting to OBG department, most of them were prescribed with Cefixime (77.78%) and most patients visiting to general physician in General OPD were prescribed with cefpodoxime. This study showed that the duration of antibiotic therapy ranges from 3 to 7 days, with an average of 5.86 days, with majority of the patients receiving it for 7 days. Apart from antibiotics adjuvant medicines that were prescribed frequently for UTI symptoms were Paracetamol as antipyretic, Hyoscine butylbromide as antispasmodic and Disodium hydrogen citrate (Urine alkalisers) for burning micturition. This is quite similar to the results obtained by R Mishra et al but in place of hyoscine butylbromide other antispasmodics like Dicycloverine were used. [12]

CONCLUSION

From the study, we conclude that the incident of UTI is more common among females than males. Uncomplicated UTI is high among young married females. Pregnancy, post-menopausal, OCP users, renal stones and hydronephrosis are the predisposing factors of UTI. Fever, dysuria, urine urgency, flank pain, lower abdominal pain and lower back pains are the typical symptoms of UTI. Analysis of pus cells and epithelial cells is a useful indicator for the determination of UTI. Cephalosporins are the most commonly prescribed antibiotics for UTI followed by fluoroquinolones and nitrofurantoins.

RECOMMENDATION

Urine culture reports should be use for definitive therapy of UTI. Evaluation of sensitivity pattern is also essential for rational and appropriate use of antibiotics. Trimethoprim-sulfamethoxazole can be tested as first line therapy because of their low cost and efficacy for uncomplicated UTI unless the prevalence of resistance to these agents among uropathogens in the communities is greater than 10%. Fluoroquinolones (norfloxacin, ciprofloxacin or ofloxacin) should be recommended as a drug of choice in case of resistance to TMP-SMX. Situations in

which fluoroquinolones are contraindicated (e.g. pregnancy, lactating woman, adolescence) nitrofurantoin or third generation cephalosporin should be recommended. There is also need for implementing regional specific antimicrobial guidelines for the treatment of UTI.

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