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Cost-effectiveness of Antibiotics prescribed for UTIs in Non-Pregnant females visiting in OBG & Gynaecology OPD in tertiary care teaching hospital: A Health Economic Analysis

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ABSTRACT:

Background & Methods: The aim of the study is to study Cost-effectiveness of Antibiotics prescribed for UTIs in Non-Pregnant females visiting in OBG & Gynaecology. Clinical analyses of their urine, urino-genital system were carried out as per standard protocol. The urine culture confirming urinary tract infection positive cases were taken as infected population for further analysis. The case history age group and other demographic factors of the positive cases were recorded.
Results: Total 200 patients were treated with the different drugs. Most of the patients (30%) were treated with the Sulfamethoxazole. Nitrofurantoin prescribe in (25.4%) patients. Flavoxate prescribe in (17.6%) patients. Gentamycin prescribe in (14.70%) patients and (10.7%) patients treated with Tetracyclin.
Conclusion:UTI is a serious public health problem if untreated. Early diagnosis and prompt treatment will prevent the chances of developing further complication of UTI and will help to reduce the sufferings of the patient, hospital stay and economic loss.We observed that the cost effective and effective treatment in the UTI infection is affordable with the Nitrofurantoin treatment.

Keywords: Cost-effectiveness, Antibiotics, UTI & Pregnant.
Study Design: Observational Study.

1. INTRODUCTION

Urinary tract infections (UTIs) are common and, as such, areassociated with substantial socioeconomic implications [1].At least one-half of women report experiencing one or moreUTIs in their lifetime. Most UTIs are uncomplicatedbacterial infections of the lower urinary tract (uUTIs) [2].

Escherichia coli is the uropathogen responsible for 75% ormore of uUTIs. Many patients with uUTIs experienceconsiderable impact on their health-related quality of life(HRQoL), including impairments in functioning at work,school, and home [3]. Treatment of uUTIs is necessary notonly to improve patient HRQoL, but also to reduce the risk ofprogression to pyelonephritis, a more serious condition.Several antibiotics are used in Canada for treatmentof uUTIs, including trimethoprim, trimethoprim–sulfamethoxazole(TMP–SMX),

fluoroquinolones such as ciprofloxacin,nitrofurantoin, β-lactamantibiotics such as amoxicillin–clavulanate (AMC), and fosfomycin, a phosphoric acidderivative that represents its own class of antibiotics [4].In addition to an already high burden of illness, standardtreatment options are being challenged by rising bacterialresistance rates.Common uropathogens, in particular displayvariable resistance patterns over time and by region.Thisrequires practitioners to be aware of current local resistancerates and to be vigilant in tracking regional changes beforeempirically prescribing antibiotics for the treatment of UTIs. For decades, TMP–SMXwas considered first-line therapyfor uUTIs [5], but rising rates of TMP–SMX resistanceamong uropathogens, and consistent evidence that in vitroTMP–SMX resistance correlates with bacterial and clinicalfailure, have forced a reappraisal of its first-line use foruUTIs. Today, the E. coli resistance rate to TMP–SMXexceeds the 20% threshold at which guidelinesrecommend against TMP–SMX use for uUTI treatment. E. coli resistance to the commonly used fluoroquinoloneciprofloxacin was 19% in 2007–2009[6], approximately twice the threshold above which theInfectious Diseases Society of America/European Societyfor Microbiology and Infectious Diseases (IDSA/ESCMID)clinical practice guidelines no longer recommend use of fluoroquinolonesfor uUTIs [7]. Bacterial resistance has severaldetrimental consequences for patients and society, includingtreatment failure and risk of complications, increased lengthof stay in hospital facilities, increased expenses, and increasedmortality [8].

2. MATERIAL AND METHODS

This cross-sectional observational study was conducted in the department of Obstetrics and Gynaecology of our tertiary care teaching institution for a period of six months 1 January 2022 – 31 June 2022.

For the study 200 cases of suspected UTI visiting OBG OPD in the Santosh Medical College & hospital, Ghaziabad collaborate with NCR Institute of Medical Sciences Meerut, during 1 January 2022 to 31 June 2022 were screened for further analysis. Clinical analyses of their urine, urino-genital system were carried out as per standard protocol. The urine culture confirming urinary tract infection positive cases were taken as infected population for further analysis. The case history age group and other demographic factors of the positive cases were recorded.

Mid-stream urine was collected in a sterile dry wide necked and leak proof container. Then the containers were labelled with the date, the name, time and serial number of the patient. The collected urine specimens were transported to microbiology department for further culture and sensitivity antibiotic screening with the temperature of 40C with coolant pack to the laboratory.

Inclusion criteria

Non Pregnant females, the inclusion criteria for the study were females of age group (12–60 years) residing in the study area, who were apparently infected by Urinary Tract Infection.

Exclusion criteria

The exclusion criteria for the study were females on any anti-biotic therapy, females on menstruation phase of the menstrual cycle, females with known urinary tract anomalies and females who were pregnant.

3. RESULT

A total number of 200 patients aged 12-60 years were included in this study. Total 200 patients of UTIs attending the Gynaecology OPD. In the age group 42-51 most of patients found patients (31.37%) were found in this age group. Second largest number found in the age group 52-60 years patients (25%) were found with the complain of painful micturition, burning micturition and increase frequency of micturition. In the 32-41 age group (16.66%) patients were found. In the 22-31 age group (9.80%) and 12-21 age group (17.64%) patients were found of UTI.

Table No. 1:Distribution of patients according to age group

Age	Patients	Percentage
12-21	**36**	**17.6**
22-31	**20**	**9.5**
32-41	**34**	**16.6**
42-51	**64**	**31.3**
52-60	**50**	**25**
Total	**200**	**100**

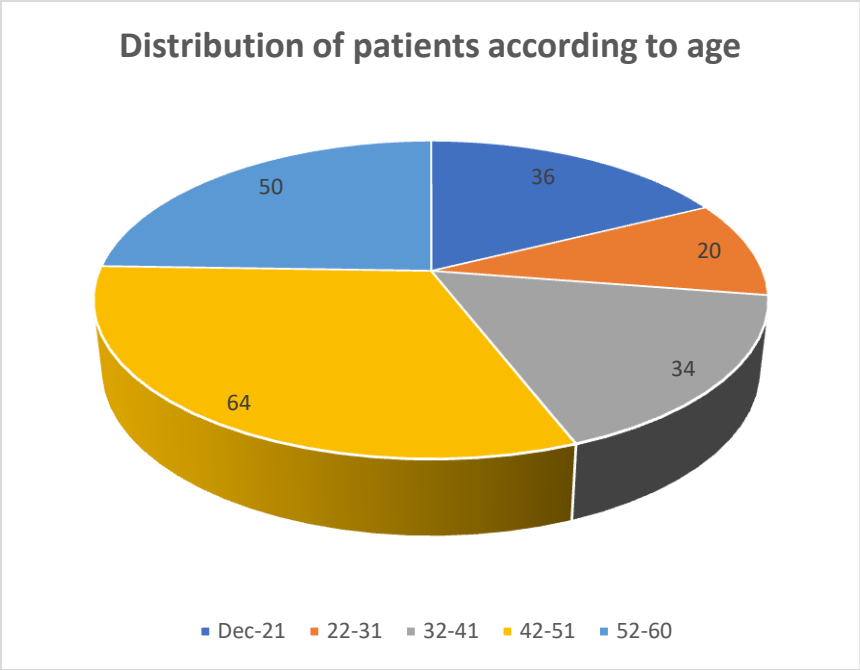
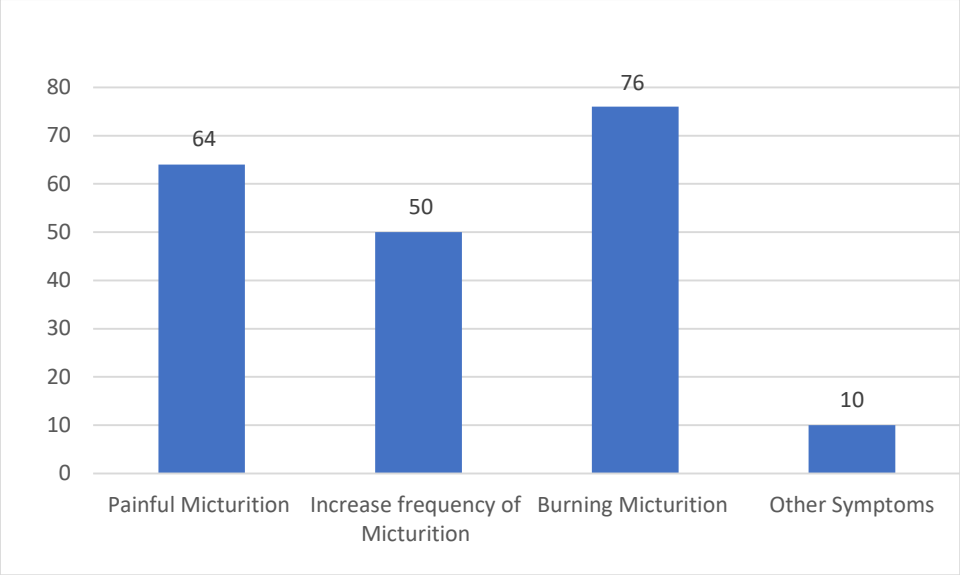


Table No. 2:Distribution of patients according to Symptoms

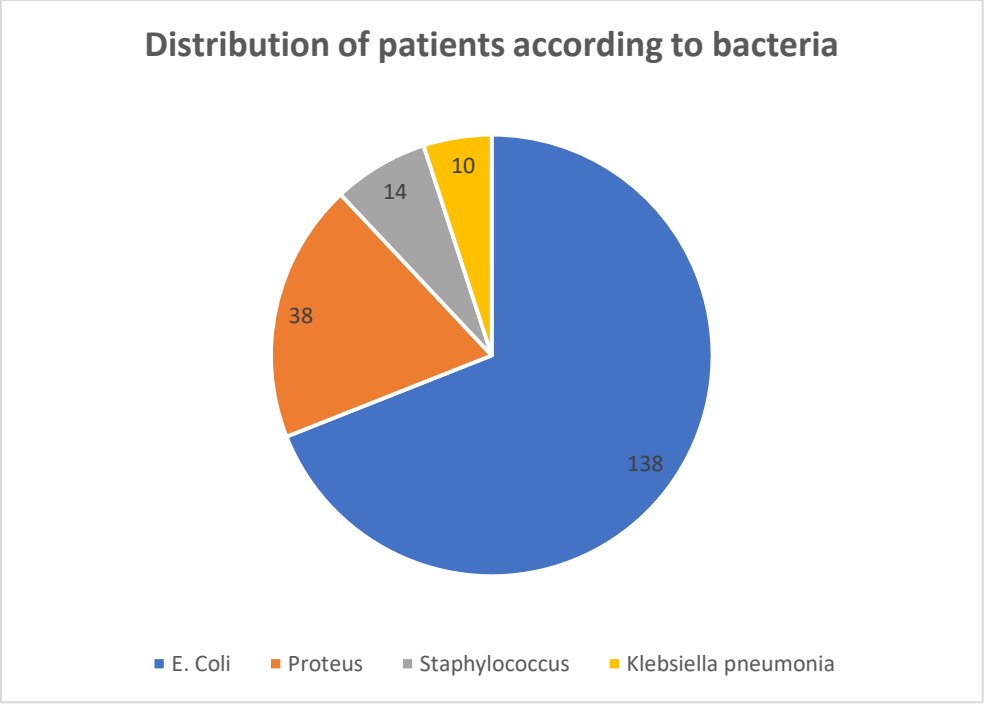
Age	Patients	Percentage
Painful Micturition	**64**	**31.3**
Increase frequency of Micturition	**50**	**24.5**
Burning Micturition	**76**	**38**
Other Symptoms	**10**	**4.9**
Total	**200**	**100**



According the table the total 200 patients were divided basis the symptoms. Most of the (38%) patients were found with complain of burning micturition. 64 (31.3%) patients complain of painful micturition. (24.50%) patients were found with complain increase frequency of micturition, and (4.90%) were with other symptoms.

Table No. 3:Distribution of patients according to bacteria

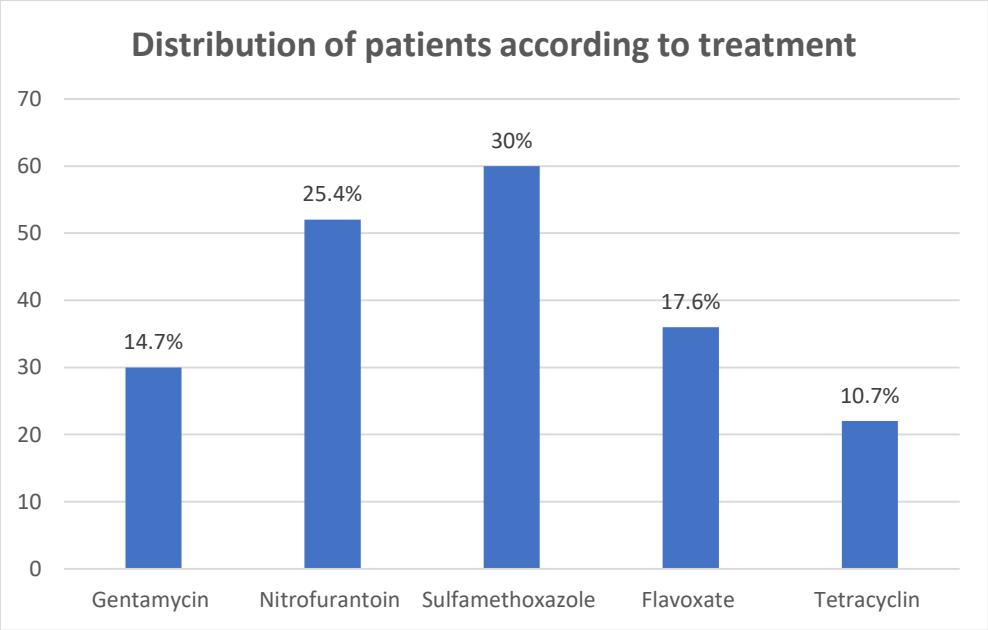
Age	Patients	Percentage
E. Coli	**138**	**69**
Proteus	**38**	**18.6**
Staphylococcus	**14**	**6.8**
Klebsiella pneumonia	**10**	**4.9**
Total	**200**	**100**



According the table the total 200 patients were divided basis of bacterial infection. After the cultures of urine sample (69%) patients were infected with E. coli bacteria. (18.62%) patients were infected with Proteus. (6.86%) patients were infected with Staphylococcus, (4.90%) were infected by Klebsiella pneumonia bacteria.

Table No. 4:Distribution of patients according to treatment

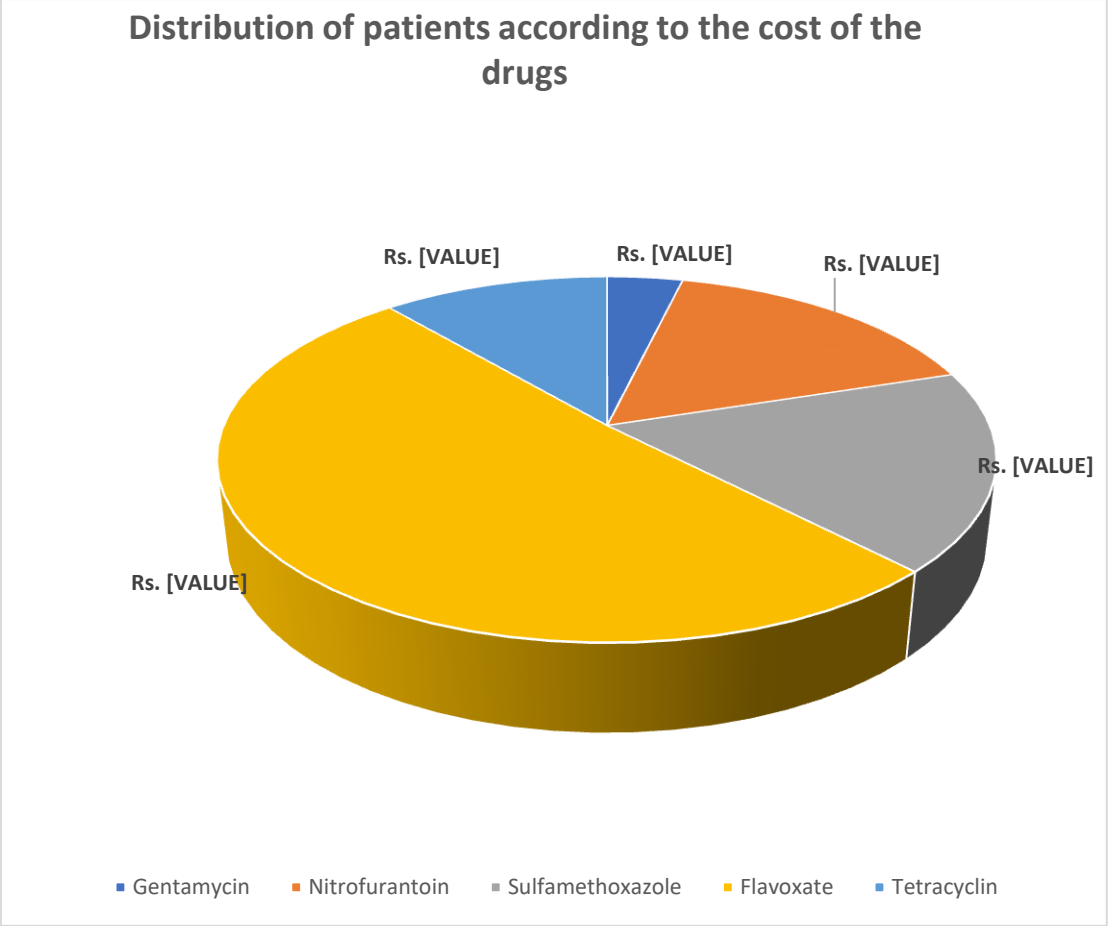
Age	Patients	Percentage
Gentamycin	**30**	**14.7**
Nitrofurantoin	**52**	**25.4**
Sulfamethoxazole	**60**	**30**
Flavoxate	**36**	**17.6**
Tetracyclin	**22**	**10.7**
Total	**200**	



According the table the total 200 patients were treated with the different drugs. Most of the patients (30%) were treated with the Sulfamethoxazole. Nitrofurantoin prescribe in (25.4%) patients. Flavoxate prescribe in (17.6%) patients. Gentamycin prescribe in (14.7%) patients and (10.7%) patients treated with Tetracyclin.

Table No. 5: Distribution of patients according to the cost of the drugs

Age	Patients	Price per prescription (Rs)
Gentamycin	**30**	**11**
Nitrofurantoin	**52**	**48**
Sulfamethoxazole	**60**	**52**
Flavoxate	**36**	**150**
Tetracyclin	**22**	**33**
Total	**200**	



According the table the total 200 patients were treated with the different drugs. The cost of per prescription was different. Most of the patients (30%) were treated with the Sulfamethoxazole and the cost of per prescription treated with Sulfamethoxazole was 52 rupees in Indian currency. Nitrofurantoin prescribe in (25.4%) patients and the cost of per prescription treated with Nitrofurantoin was 48 rupees. Flavoxate prescribe in (17.6%) patients and the cost of per prescription treated with Flavoxate was 150 rupees. Gentamycin prescribe in (14.7%) patients and the cost of per prescription treated with Gentamycin was 11 rupees and (10.7%) patients treated with Tetracyclin and the cost of per prescription treated with Tetracyclin was 33 rupees in Indian currency.

4. DISCUSSION

The interaction between the host and microorganism beforeinfection takes place is complex. E. coli has been studied extensively,it being the most common uropathogen.transplants) and need referral to the Urologist. They usually takelonger to respond to treatment and if the underlying cause is notremoved they are likely to re-occur. This may be within days,weeks or months from the original infection.

Uncomplicated UTI occur in women with a normal urinarytract and react quickly to therapy.Cystitis describes inflammation of the bladder, usually inresponse to bacterial infection. Classically, the patient presentswith typical symptoms of urgency, frequency, dysuria, suprapubicdiscomfort, and discoloured foul smelling urine caused byinflammation of the bladder in response to bacterial invasion[9].

Cystitis is a common clinical diagnosis. Approximately 50% of allwomen experience a UTI at some time in their life. They accountfor 1e3% of general practitioner consultations in the UK andapproximately 150 million cases per year worldwide[10].

In the majority of cases, gram negative coliform bacilli(Enterobacteriaceae) account for the infection and EscherichiaColi remains the most prevalent uropathogen (77%). Infection iscommonly preceded by colonisation of the perineum and periurethralarea by rectal flora.

Diagnosis using urine dipsticks assessing nitrite, leucocyteesterase and erythrocytes are frequently used in the primary caresetting. The presence of leucocytes implies inflammation of theurothelium. Nitrites are strongly suggestive of significant bacteriuriaand empirical antimicrobial treatment should becommenced. Urine dipstick testing is convenient and has provento be cost-effective in general practice. In most patients UTI is asingle event and no further investigation is needed[11].

The natural history of cystitis is resolution of the symptomswithin 4-7 days. In the GP setting, in fit healthy young women,delaying antibiotics by 48 hours to allow for resolution ofsymptoms reduces the use of antibiotics without significantlyprolonging symptoms. There are several "self-help" measurespatients can initiate themselves. Increasing fluid intake shortensthe intervals between voids and achieves a high flow rate,therefore diluting and flushing out the microorganism[12]. Urinealkalinising preparations, e.g. a teaspoon of bicarbonate of sodadissolved in water taken every few hours, provide symptomaticrelief by reducing the acidity of the urine, thus reducing thestimuli to bladder afferent nerves.

5. CONCLUSION

UTI is a serious public health problem if untreated. Early diagnosis and prompt treatment will prevent the chances of developing further complication of UTI and will help to reduce the sufferings of the patient, hospital stay and economic loss. In this study the cost of the treatment with Flavoxate is more costly and the patient not afford easily. Treatment with Nitrofurantoin is good and the effect of this drug is also good. Overall we observed that the cost effective and effective treatment in the UTI infection is affordable with the Nitrofurantoin treatment.

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