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## Prevalence and Drug Sensitivity of Uropathogens in Patients With Neurogenic Bladder.

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### ABSTRACT

Urinary tract infection is one of the most common urologic disorders. This study is aimed to determine prevalence and drug sensitivity of uropathogens in patients with neurogenic bladder. Patients with brain, spinal cord or any other nerve malfunction presenting with neurogenic bladder are more susceptible to uropathogens<sup>(5)(7)</sup>. Retrospective study was carried out in 350 patients with diagnosed neurogenic bladder presented in ICU, General Medicine and Emergency department and with various diagnostic tests the prevalence and drug sensitivity in these patients was studied. Among 350 patients, 296 (85%) showed the positive results. Among the positive cases 222(75%) were found in ICU, 44(15%) were in general ward and 30(10%) were found in emergency department. The study showed commonest isolates were *Escherichia coli*, *Pseudomonas auregenosa*, *Enterobacter spp*, *Staphylococcus spp*, *Klebsiella spp* and *Proteus mirabilis*. The most sensitive antibiotics were Colistin, Meropenam, Nitrofurtoin, Tigecycline and the most resistant were Ampicillin and Ciprofloxacin. The result of our study highlighted an alarming prevalence of urinary tract infections in patients with neurogenic bladder and diverse response to antibiotics.

**Keywords:** Bacteriuria, Neurogenic bladder, Spinal cord injury, uropathogens

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## INTRODUCTION

Patients with increased risk of UTI's are female gender, advanced age, diabetics, anatomic abnormalities, impaired mobility, immune suppressed, urinary-incontinence and instrumentation [1,2]. One of the most recurrent complication in patient with neurogenic bladder is urinary tract infection and is always a challenge for the management. Pathogenic factors include long term catheterization, bladder over distension, vesiculo-urethral reflex, high pressure voiding, large post voiding residual volume and urinary stones [6]. Any delay in diagnosis can lead to life threatening conditions in patients and overtreatment lead to drug resistance. As per our study out of 350,296 patients with neurogenic bladder that gave positive results,32%-38% presented with lower urinary tract infection,2%-4% presented with pyelonephritis,70% with indwelling catheters presented with recurrent UTI, 80% in patients with spinal cord injury having indwelling catheters and 45% in patients without catheters as shown in( chart 1).

## MATERIALS AND METHODS

### Study Population

The study was carried out in the Department of Microbiology in conjunction with the ICU, General Medicine and Emergency Department of Sree Balaji Medical College and Hospital. The study population comprised a total of 350 patients with neurogenic bladder. Out of 350 patients, 150 patients were from ICU ,120 were from General Medicine and 80 were from the Emergency Department.

### Specimen Processing

The urine samples were inoculated immediately after collection onto the culture plates and the inoculated plates were incubated .The colonies formed were identified by gram-staining and other biochemical tests.

### Antimicrobial Susceptibility Testing

All the isolates were examined for susceptibility to cotrimoxazole, ciprofloxacin, meropenem, colistin, tigecycline, nitrofurantoin, fosfomycin by disk diffusion method.

## RESULTS

About 85% of patients with severe urinary incontinence due to neurodeficit and presence of indwelling catheters were found positive. Among the positive cases 75% were found in ICU, 15% in General Medicine and 10% in Emergency. Most common isolates were *Enterobacter spp* and *Pseudomonas aureginosa* (66%), *Escherichia coli*(24%), *Klebsiella oxytoca*, *Proteus mirabilis*, *staphylococcus* and others(10%) in ICU patients and *Escherichia coli*(67%) was found in patients from the General Medicine and Emergency room. The study showed treatment of these patients with cotrimoxazole does not decrease the symptomatic bacteriuria but instead it increases the prevalence of resistance in the patients with neurogenic bladder. The study revealed drug resistance-70% in cotrimoxazole,58% in ampicillin,40% in cefaclor,36% in cefuroxin,32% in ciprofloxacin and 26%in tobramycin(table 1). The drug sensitivity of 95% in meropenem, 90% in colistin, 87% in tigecycline, 85% in azetronem and 82% in nitrofurontoin.(table 2).

## Prevalance of UTI in neurogenic bladder

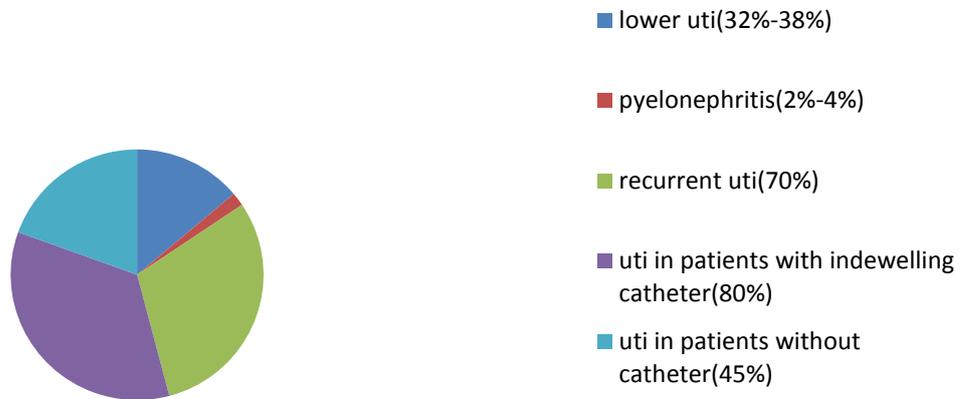


Chart 1: Mean resistance rates

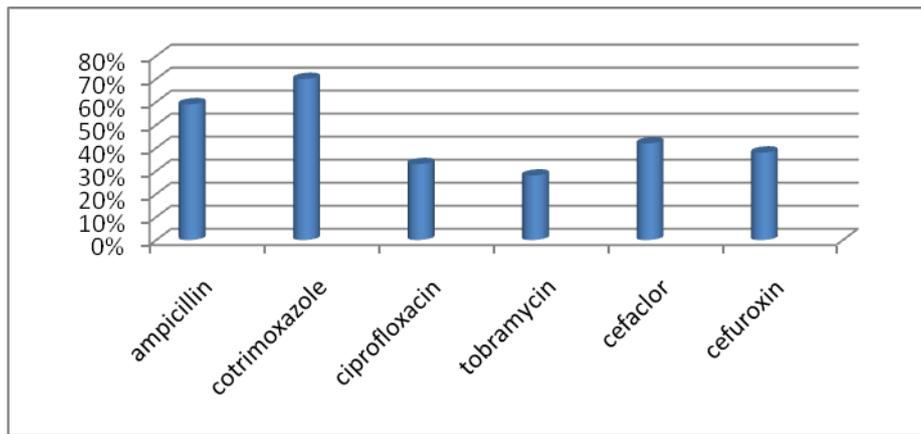


Table 1: Mean sensitivity rates

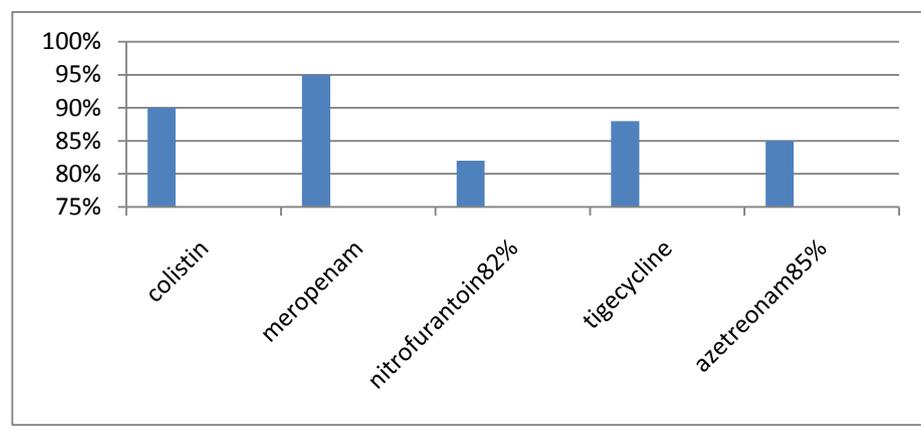


Table2

## DISCUSSION

Urinary tract infection is one of the most common complication in patients with neurogenic bladder. The aim of our study is to review the prevalence of uropathogens in neurogenic bladder patients and was found around 85%. As per our study *Pseudomonas* and *Enterobacter* alone contribute to around 66% of the uropathogens. The treatment in symptomatic patients should be started early as delay can lead to grave complications and drug inefficiency and at the same time prolonged antibiotic therapy contribute to the problem of drug resistance. The incidence of UTI in these patients can be decreased by early diagnosis and treatment and proper rehabilitation [3-7].

## CONCLUSION

The most common uropathogens in patients with neurogenic bladder is *Pseudomonas aureginosa*, *Enterobacter* and *Escherichia coli*. The study showed resistance to ampicillin, gentamycin, co-trimoxazole in patients with neurogenic bladder. And high sensitivity and susceptibility to colistin, meropenam, nitrofurantoin, tigecycline and azetreonam which can be used for the empirical treatment of patients for urinary tract infection with neurogenic bladder. Uropathogens are important to study as they have become a clinical problem in patients with neurogenic bladder and they show a diverse response to different antibiotic therapy.

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