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Isolation of acinetobacter species in ICU: To study antimicrobial resistance pattern in a tertiary care hospital

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ABSTRACT

To isolate the Acinetobacter species and their antimicrobial resistance pattern. The study was done for a period of one year from July 2013 to June 2014. A total number of 452 patients were included in the study. The culture reports of these patients were analyzed which included ET secretions from patients of end tracheal infections , BAL from pneumonia , Sputum of lower respiratory tract infections patients . The culture which were positive for Acinetobacter spp were identified and their resistance towards antimicrobials was tested. Among 82 strains of Acineobacter spp were obtains comprising of 48 (58.53%) from ET samples ,22 (26.83%) from BAL fluid , 12(14.64%) from Sputum culture .Of these 12 strains were found to be resistance to amikacin . Acinetobacter spp was found to be sensitive to Impenem and Amikacin. Imipenem is found to be very effective in controlling infections caused by Acinetobacter.

Keywords: Acinetobacter, antimicrobials, ICU's

INTRODUCTION

Infections in the ICU lead to increased mortality and costs. Antibiotic resistant bacteria are becoming an increasingly difficult problem in intensive care unit (ICU) .The factors that contribute to the high rate of infection and mortality in ICU are possibly associated with the severity of the underlying disease, invasive proceeding and the long period of hospitalization. Indiscriminate use of antibiotics especially the broad spectrum, multidrug resistant bacteria, which complicates therapy. The rate of infection, especially respiratory infections are high among intensive care patients [1]. Resistance to antimicrobial is mediates by mechanisms like production of enzymes or alteration of antibiotic targetsite or prevention of antibiotic access to the target site or by active efflux of antibiotics [2]. Acinetobacter is one of the common agent in respiratory infections. Acinetobacter is a Gram negative cocco bacilli and non motile bacterium

MATERIALS AND METHODS

The study was conducted for a duration of one year from July 2013 to June 2014 at kamineni Medical Sciences, Telangana State, India. A total number of 452 patients were included in the study. The ET secretions BAL fluid; sputum samples of these patients were collected. On reaching the Laboratory were inoculated on Mac conkey agar, Blood agar, Nutrient agar Thioglycolatebroth to isolate the organisms. The inoculated agar pales were Incubated aerobically at 37^0 C for 24 hrs. After overnight incubation the Blood Agar, MacConkey Agar, Nutrient Agar examined for evidence of growth. The Colony characters were studied, smears were stained by Gram's stain and Examined under 100x objective. The bacterial species then isolated were identified by morphology , cultural

characteristics and biochemical reactions according to the standard techniques[3]. The Gram negative bacilli identified were tested for catalase, motility by hanging drop method , oxidase , oxidation fermentation test, nitrate reduction test, TSI, urease, citrate test. Acinetobacter spp produced nonlactose fermenting, smooth irregular colonies on Mac conkey agar. 82 strains of acinetobacter spp were obtained comprasining of 48 from ET , 22 from BAL fluid 12 from sputum samples (Figure 1)The antimicrobial susceptibility pattern of isolates was tested by Kirbybauer disc diffusion method by CLSI guide lines. [3]

The antibiotics used were Amikacin(30mcg) ,Gentamicin(30mcg), Ciprofloxacin(5mcg) , Piperacillin(75mcg) , Imipenem (10mcg) ceftazidime(30mcg), cefotaxime(30mcg) from Himedia Pvt Limited.

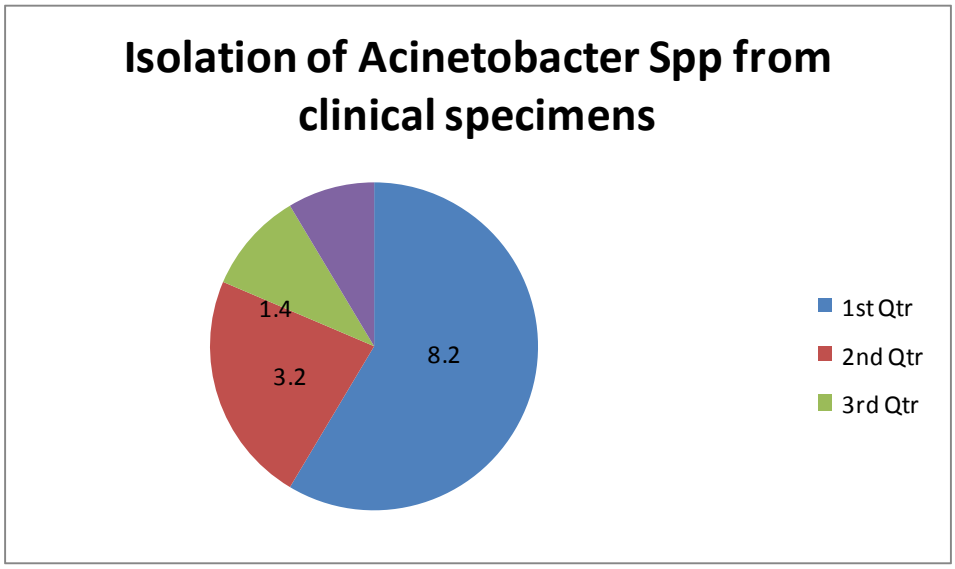

Figure 1: Acinetobacter isolates from samples

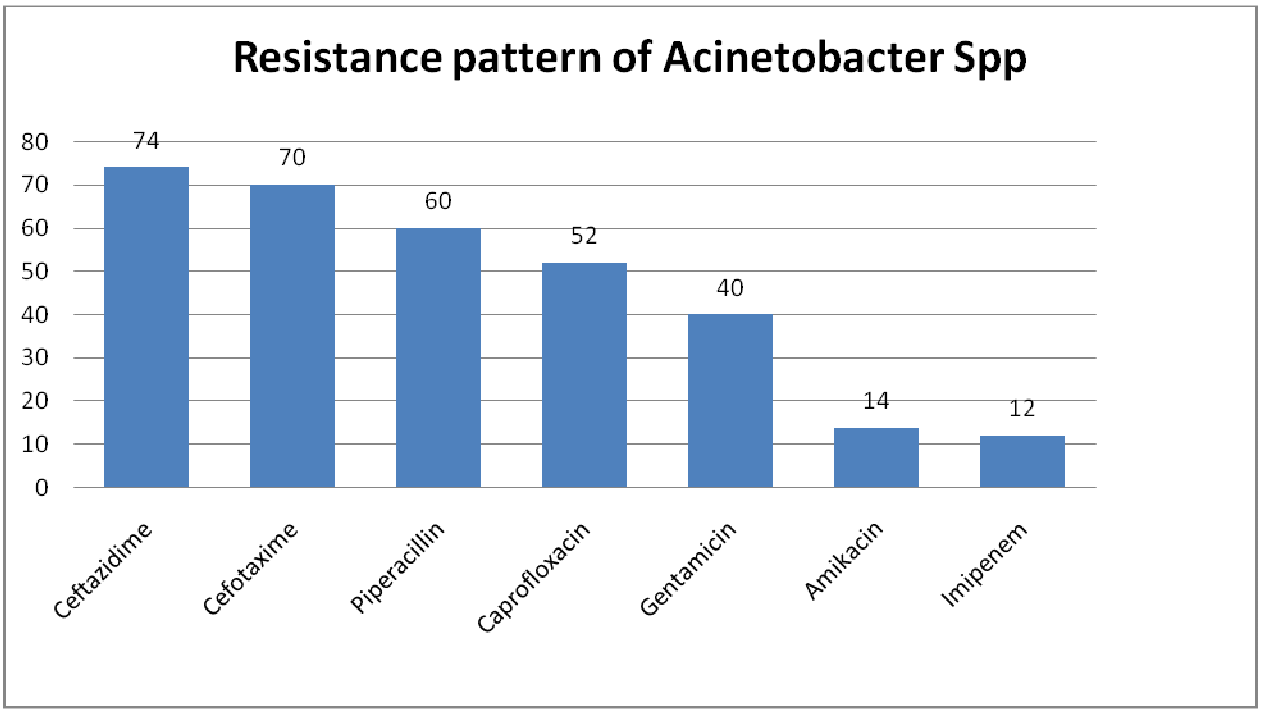

Figure 2: Resistance Pattern of Acinetobacter spp

RESULTS

A total number of 452 ICU patients were included in the study. Out of 82 strains of Acinetobacter spp isolated , 14 strains were found to be resistant to amikacin , 12 strains to Imipenem. The resistance with other drug s like gentamicin (40), ciprofloaxacin (52), iperacillin (60), cephotaxime (70), & ceftazidine (74). Figure (2).

DISCUSSION

In our study Acinetobacter spp was isolated in 82 strains and amongst them the organism was isolated from ET secretions in 48 cases emphasing the importance of Acinetobacter spp as aetiology for Endotracheal infections (58.53%).

In our study Acinetobacter spp 48 (58.53%) was isolated from ET Secretions was comparable to Veenu Gupta, et al (58.8%), in contrast Joel passos et al reported as pseudomonas spp 50% respectively . Azizum nahar et al reported 10% Acinetobacter spp from ET secretions which is less than that our study 58% In our study impenem resistance to Acinetobacter spp was 15% it is Comparable to P Glad stone et al reported as 14.2% [6] but Veenu Gupta et al, reported higher percentage of imipenem resistance 40% [7].

CONCLUSION

ICUs are the one of the critical hospital environments where resistant bacteria are found most extensively. This study contributes to the knowledge of the prevalence of pathogens and their antibiogram in the clinical specimens in our geographical area. This is essential to develop an antibiogram pattern to be used in the hospital for prophylaxis and treatment, in order to reduce the development of resistant bacteria .Emphasis was laid on various infection control measures such as adequate hand washing techniques, aseptic measures for all procedures, antibiotic cycling and health education for the health personnel. [4]

This report reveals the Microbiology profile in patients in ICUs. Regular Microbiological Surveillance help in implementing better herapeutic strategies to reduce the high morbidity And mortality among the patients in critical care setting[5].

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