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ISOLATION AND STUDY ON ANTIBIOGRAM PATTERNS OF PSEUDOMONAS SPECIES ISOLATED FROM POST OPERATIVE INFECTION.

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ABSTRACT--*Postoperative wound infection is an important cause of infection in health care associated infection in hospitals. The most commonly seen bacterias in the postoperative infections are Staphylococcus aureus , Escherichia coli , Enterococci, Pseudomonas aeruginosa, and Streptococcus pyogenes. The risk of post operative infection is of prime importance because of emerging durg resistance in bacteria that delays the healing. Pseudomonas aeruginosa is a gram negative pathogen that causes health care associated infections.To isolate and study the antibiogram pattern of Pseudomonas sps isolated from post operatives infection.30 samples were collected from post-operative infection and cultured for the presence of Pseudomonas. The antibiotic sensitivity test was performed to find out the antibiogram susceptibility pattern of the Pseudomonas isolated,Out of 30 samples collected from post operative infections, Pseudomonas species was isolated from 6 samples. They all showed sensitivity towards ciprofloxacin, cefepime, amikacin, meropenem, aztreonam and resistance towards imipenem, colistin, ofloxacin and cefoperazone.*

KEYWORDS: *post-operative infection drug ,resistance, Pseudomonas, Antibiotic sensitivity testing*

I. INTRODUCTION

A postoperative infection is any infection that occurs within 30 days of operation and can be related to a postoperative course or the operation itself.This infection will result in the complications of wound healing which is commonly observed [1]. The surgical wounds are commonly infected by bacteria,nevertheless if the bacteria is present on the patient's skin or could be spread due to contact with infected ones[2].The higher risk of complications are seen in older people who are prone to pulmonary disease,overweight,other illnesses and high BP[3].

Postoperative infections still remain a challenge in many surgical procedures even with an improved surgical procedure and powerful antibiotics[4].The most commonly seen bacterias in the postoperative infections are Staphylococcus aureus , Escherichia coli , S. aureus, Enterococci, Pseudomonas aeruginosa, and Streptococcus pyogenes [4-6].

Pseudomonas aeruginosa is a gram negative,rod shaped,oxidase positive and lactose non-fermenting bacteria which causes disease in both plants and animals,including human being.It requires only minimal nutritional

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requirements for its growth so it can grow in environments like dry surfaces of hospital rooms,clinics,even in sinks and showers.The symptoms of the infection are seen as inflammation and sepsis, if they occur in critical organs like lungs,urinary tract and kidney can result fatal[7].These species are commonly involved in infections of dental procedures.P.aeruginosa is always seen in immunosuppressive patients admitted in intensive care unit due to exposure of instruments, and devices for mechanical ventilation[8].The oral cavity serves as a major site for p.aeruginosa and in weaker patients like elderly and immunocompromised patients and can cause major health issues[9].

Certain antibiotic classes like penicillin,cephalosporins,monobactams,carbapenems helps in inhibition of bacterial cell wall synthesis.Fluoroquinolones group blocks the DNA synthesis and Aminoglycosides helps in protein synthesis inhibition.With these huge spectrum of antibiotics these species are highly resistant to large range of antibiotics and can develop additional resistance during the course of therapy[10].They are known to utilise higher levels of intrinsic and acquired resistance mechanisms to counter antibiotics. Adaptive antibiotic resistance includes biofilm mediated resistance and formation of multidrug tolerant cells.In intrinsic resistance mechanism there is a low outer member and permeability and over expression of efflux pump.It gains adaptive resistance due to continuous exposure to antibiotics and overexposure to environmental stress and also gains acquired resistance by mutation and horizontal gene transfer.This can increase the duration of hospitalisation and the complete cost of patient care.The most important challenge in prevention of these infections are they are difficult to evaluate and to provide a sound technique to the infected patient[11].The use of antibiotic prophylaxis before surgery, appropriate choice of antibiotic, limiting the duration of antimicrobial administration, all these have significant reduced these infections. [12] The choice of drug is significant as it plays against the active pathogens associated with infection. These recent improvements have helped in significant reductions of postoperative infections. Also different combinations of antibiotics with better activity against P.aeruginosa is obtained like cephalosporins and quinolones, ceftazidime and colistin, meropenem and levofloxacin. The present study is check the antibiogram susceptibility pattern of Pseudomonas sps isolated from post operative wound infections, which may help us to know about the prevalence of drug resistance strains in the surrounding.

II. MATERIALS AND METHODS

A total of 30 samples were collected from different patients with post operative infections who had been admitted to Saveetha dental college. The samples were sent to microbiology lab for bacterial isolation and detection The samples were inoculated in Nutrient agar and Brain heart infusion agar .Presumptive identifications of Pseudomonas was done by Gram's stain, Oxidase test and by detecting pigment production in which Pseudomonas are Gram negative bacilli, oxidase positive and produces diffusible greenish pigment on nutrient agar respectively. The antibiotic discs used wereciprofloxacin, cefepime ,amikacin, meropenem, aztreonam imipenem, colistin, ofloxacin and cefoperazone[fig 1]. The discs were placed in the plate and the organism is spread over the plate using a loop and then it is placed for incubation at 37°c overnight and checked for zone of inhibition[Fig 2].

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Fig 1: Antibiotic discs used.

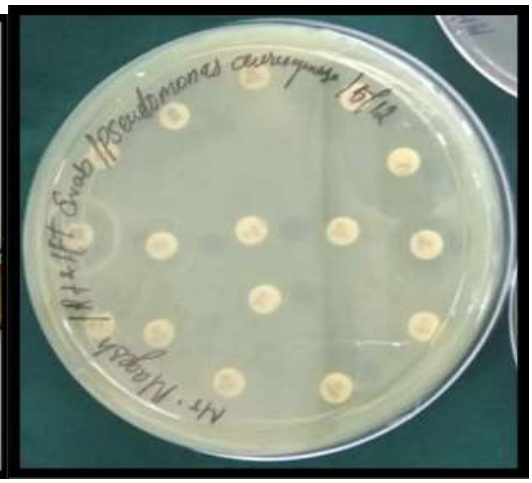

Fig 2: Antibiotic sensitivity testing plate

III. RESULT

Out of 30 samples collected from post operative infections, Pseudomonas species was isolated from 6 samples. Kirby bauer disc diffusion technique was performed to check the susceptibility pattern with different antibiotic discs. The zone of inhibition is measured and results are interpreted as resistance, moderately sensitive and sensitive. [Table 1] They all showed sensitivity towards ciprofloxacin, cefepime ,amikacin, meropenem, aztreonam and resistance towards imipenem, colistin, ofloxacin and cefoperazone.

ANTIBIOTIC	SAMPLE :1	SAMPLE :2	SAMPLE:3	SAMPLE :4	SAMPLE :5	SAMPLE:6
Ciprofloxacin(CIP)	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE
Cefepime(CPM)	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE
Amikacin(AK)	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE
Imipenem(IMP)	RESISTANCE	RESISTANCE	RESISTANCE	RESISTANCE	RESISTANCE	RESISTANCE
Colistin(CL)	RESISTANCE	RESISTANCE	RESISTANCE	RESISTANCE	RESISTANCE	RESISTANCE
Ofloxacin(OF)	RESISTANCE	RESISTANCE	RESISTANCE	RESISTANCE	RESISTANCE	RESISTANCE
Cefoperazone(CPZ)	RESISTANCE	RESISTANCE	RESISTANCE	RESISTANCE	RESISTANCE	RESISTANCE
Meropenem(MRP)	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE
Aztreonam(AT)	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE	SENSITIVE

Table : Antibiotic sensitivity pattern of Pseudomonas sps

IV. CONCLUSION

Antibiotic susceptibility results revealed that a high degree of resistance was seen for the majority of the bacterial isolates. The degree of resistance was even higher among the gram negative bacteria and the commonly used drugs were found to be more resistant with an average resistance range from 50% to 100%.Meropenem, and amikacin were found to be the most effective antimicrobial agents whereas ampicillin, cefotaxime were among the most resistant drugs. P.aeruginosa strains isolated in the present study were found highly resistant in comparison to the previous studies[13].The development of this resistance is a huge problem and antimicrobial chemotherapy

plays a major role in the antibacterial resistance. Even over prescription of antibiotics can also results in antibiotic resistance[14].So judicial usage of antibiotics plays a major role to provide good global health care.

The main challenges which are faced in prescription of antibiotics are to achieve a rational choice and proper use of antibiotics and to recognize their potential problems.[15].To reduce the problem of antimicrobial resistance, doctor requires clear guidelines of appropriate prescribing antibiotics.

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