



**STUDY OF BACTERIAL ISOLATES AND THEIR ANTIBIOTIC SUSCEPTIBILITY
TEST CAUSING PYOGENIC INFECTION**

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ABSTRACT

Pyogenic infection is the most common cause of death. Prompt and appropriate antimicrobial therapy is needed to reduce the burden and complications associated with these infections. This was prospective observational study which determines the antibiotic sensitivity patterns of frequently isolated organism from pus culture. Majority of antibiotics are still sensitive and can be prevented from being listed among multidrug resistant. There should be interaction between a clinician and clinical microbiologist to minimize the spread of multi drug resistant strains in the hospitals and to ensure authentic treatment to the patients. The aim of the study is to isolate and identify the organism with their antibiotic sensitivity. The result reveals *staphylococcus aureus* to be the most common organism to be isolated which was followed by *E.coli*, *Pseudomonas*, *Klebseilla*, *Citrobacter Enterobacter*, *Acinetobacter*, *Proteus*, *Enterococcus*, *CONS*, *S.pyogenes*. The antibiotic sensitivity pattern show 100% sensitivity to Vancomycin, Linezolid, Polymyxin B and Colistin.

KEYWORDS: Pyogenic infection, Pyoderma, Pus, Wound infection, AST.

INTRODUCTION

Skin acts as an excellent barrier for all types of infection. Most of the micro-organism lives on the skin, gastrointestinal tract and other parts of the body. They are least intent to cause infection in the individual because of the defense mechanism within the body. The individual defense-mechanism can be hampered by trauma, cut, burns and other factors. The infection is caused by the entry of microorganism into the skin, it get multiply and produce symptoms. Most of the pyogenic infection is caused by bacteria, followed by virus and parasite. It causes inflammatory response, which involve bacterial cell and lead to wound infection.^[1] Pyoderma is most common problem in society it is seen in people who have very low social and economic status.^[2-4] The group's which involve in the social and economic status are young childrens.^[2-6] The Majority of organisms are oxygen dependant and oxygen independent bacteria which are responsible for pyogenic infection, which commonly cause high rate of death, in the individual. Routine use of antibiotics leads, to antibiotics resistant in organism. There is huge range of multidrug-resistant in the clinical sample, this lead to survey for the pyogenic infection-to avoid misuse of treatment.^[7]

MATERIALS AND METHODS

Sample

A total of 500 samples were collected from patients attending TMMC & RC. Moradabad.

Collection of sample

The sample was collected aseptically from different parts causing pyogenic infection in the individual. Two swabs were taken from the infected area. One swab was use for gram staining procedure and other swab was processed for culture. The deep seated pus was aspirated with the help of syringe.

Processing of sample

The pus sample was inoculated on Mac Conkey agar, Blood agar and Brain Heart Infusion Broth and incubated at 37°C for 24-48 hrs. The growth on the culture media was observed. Mac Conkey agar, Blood agar showing no growth but turbidity on BHI was subculture on Mac Conkey agar, Blood agar. Characterization and isolation of organism was done on the basis of culture characteristic, gram staining and appropriate biochemical tests.

ANTIBIOTICS SUSCEPTIBILITY TESTING

Antibiotic susceptibilities of bacterial isolates was determined according to the method recommended by the Clinical and Laboratory Standards Institute. Inoculum was prepared for each bacterial isolate by adjusting the turbidity to 0.5 McFarland standard and spread on Muller-Hinton agar plates. Antibiotic discs (Himedia, Mumbai, India) was placed on the agar plates and incubated overnight at 37°C for 24 h. The zones of inhibition was measured and the isolates was classified

as sensitive, intermediate, and resistant according to CLSI tables and guidelines.^[8]

RESULTS AND DISCUSSION

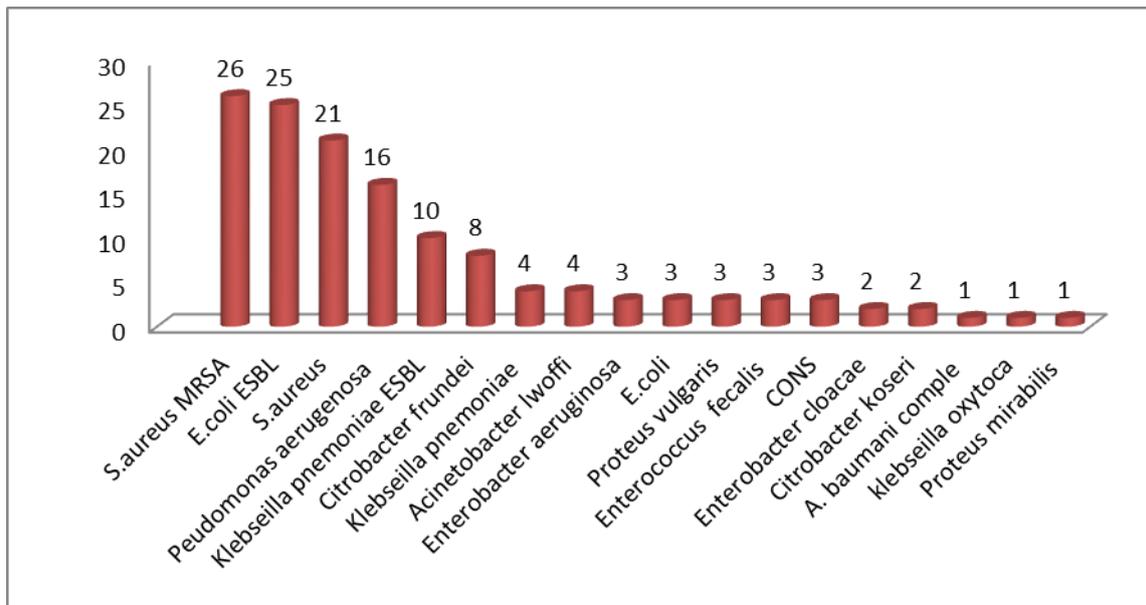
A total of 500 clinical samples were collected during the study period from various clinical departments in which 137 (27.4%) were positive for different isolates. From the 137 positive isolates, 83 were gram positive bacteria and 54 were gram negative bacteria. In the study it was seen that gram positive bacteria were more than gram negative bacteria. The percentage of gram positive bacteria was 60.58% and gram negative bacteria was 39.41%. Similar study was seen in Asmabegaum B et al shows (58.01%) gram negative and (41.98%) gram positive^[9], Zafar A et al, in which it shows (50.45%) gram negative and (49.54%) gram positive.^[10] The ratio of male was more than the female. The percentage of male was 66.42% (n=91) and female was 33.57% (n=46). In the study by Verma P it shows maximum number of male about 54 and female about 45.^[11] Men were more prone than the female as they are more involve in outdoor work because of their occupation which lead them to be more prone to injury.^[12]

The maximum age group which was seen to have pyogenic infection during the study was 21-30 years-28.46% (n=39) which was similar to the study of Asmabegaum B et al.^[9] Other age group 31-40 and 41-50 years-14.59% (n=20) which was followed by, 51-60 years-13.86% (n=19), 11-20 years -12.4% (n=17), more than 60 years- 11.67% (n=16) and least with 01-10 years- 4.37% (n=6). The high impact of infection in the age group is due to the reduce in immunity, extended period of pre-operative stay in the hospital, comorbidities like obesity and diabetes.^[13,14] Pyogenic wound infections were mainly caused by *S. aureus*, *Escherichia coli*, *Klebsiella* spp., and *Pseudomonas* spp. In the study it reveals that highest was of *S. aureus*

(34.4%), which was followed by *E.coli* (20.43%), *Pseudomonas* (11.67%), *Klebsiella* (10.94%), *Citrobacter* (7.29%), *Enterobacter* and *Acinetobacter* (3.64%), *Proteus* (2.91%), *Enterococcus* and *CONS* (2.18%), the least infection was seen with *S. pyogens* (0.72%). *S.aureus* was 100% sensitive to Linezolid and Vancomycin followed by Netilmicin (96.4%), Amikacin(99.6%), Tobramycin(85.7%), Gentamicin (85.7%). Aminoglycosides were followed by Clindamycin, Tetracyclin and Erythromycin in range of 80-90% sensitivities. Among the CONS isolated, 100% were sensitive to Linezolid and Vancomycin whereas Amioglycosides, Quinolones, Cotrimoxazole and Cephalosporins show sensitivity in range 80%-90%. It was least sensitive to Penicillin G (10%). Enterococci were most resistance to Penicillin G and Ampicillin (25%). In the study it show 100% sensitivity to polymyxin b and colistin with all enterobacteriaceae like *E.coli*, *Citrobacter*, *Acinetobacter*, *Enterobacter*, *klebsiella* and *Proteus*. In gram negative bacteria *E.coli* was sensitive to Amikacin, Ampicillin sulbactam, Ciprofloxacin, Gentamine, Ticarciline, Tobramycin and Doxycyclin. Among *Citrobacter* it is sensitive to Ampicillin sulbactam, Gentamycin, Cotrimoxazole and Doxycyclin. In *Acinetobacter* it shows sensitivity to Cefepime, Ticarcillin, Ceftazidium, Gentamycin and Cotrimoxazole. In *Enterobacter* it shows sensitivity to Amikacin, Ampicillin, Ampicillin sulbactam, Ceftazidium, Gentamycin, Doxycyclin, Ticarcillin and Tobramycine. In *Klebsiella* it shows sensitivity to Amikacin, Ampicillin, Ampicillin sulbactam, Ceftazidium, Gentamycin, Doxycyclin, Ticarcillin, Ofloxacin and Imepinum. Among the *Proteus* it shows sensitivity to Ampicillin, Ciprofloxacin, Pipracillin and Tobracycin. Among the pseudomonas it shows sensitivity to Ceftazidium, Amikacin, Cotrimoxazole, Levofloxacin, Doxycycline and Imepinum.

Table No. 1: Shows age wise distribution.

Age (Years)	Male	Female	Total	N %
01-10	3	3	6	4.37%
11_20	13	4	17	12.40%
21-30	25	14	39	28.46%
31-40	13	7	20	14.59%
41-50	12	8	20	14.59%
51-60	14	5	19	13.86%
>	11	5	16	11.67%
Total (N)	91(66.42%)	46(33.57%)	137	100



Graph No. 1: Bar diagram shows species wise distribution of isolates.

CONCLUSION

Pyogenic infections are still frequently seen in the developing countries and the treatment is a considerable challenge despite of advances in microbiological techniques and antibiotics. There should be continuous check of the drug for proper management, which will help in limiting the resistance in the drug. There should be continuous surveillance to update the knowledge of antimicrobial susceptibility profiles of clinical isolates to provide the most appropriate dose regimen and treatment schedule against pyogenic infections and to limit the expanding of drug resistance. Empirical and appropriate use of antibiotics is very important in preventing emergence of multidrug resistant bacteria. Routine recognition, diagnosis and antibiotic susceptibility testing is very important for the management of pyoderma and also to check the major complications.

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