

**Original Research Paper****Bacteriological Profile of Cellulitis with open wounds among Inpatients Admitted in a Tertiary Care Hospital**

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Ph: 9440341099, Email: murtyds@gmail.com**Abstract**

Cellulitis is a microbial infection involving the skin. It usually involves the dermis and connective tissue fat, presenting with expanding erythema, warmth, tenderness and swelling. To study the Bacteriological profile of Cellulitis patients, and their antibiogram. A total of 100 Patients having skin infections with Cellulitis were included in the present study . Pus samples were collected with a sterile swab after cleaning the adjoining area following standard procedures. They were processed by Gram's staining and was inoculated on to MacConkeys agar and Blood agar. Isolates were identified according to standard bacteriological techniques. Antibiotic susceptibility testing done by using Kirby Bauer disc diffusion technique on Muller Hiltons agar. Male Patients had higher susceptibility to skin infections associated with Cellulitis. Among the total collected 100 samples, pathogenic organism were isolated from 91 samples while only commensals grown in 9 samples. Most common organism isolated was Pseudomonas species 25 (27%), followed by Klebsiella 17 (18%), Escherichia coli 15 (16 %), Citrobacter species 15(16%) Proteus species 11(12%), Staphylococcus aureus 5 (5.4 %) and Acinetobacter species 2(2.1 %). Most of the Gram negative bacilli were sensitive to meropenem (90%), aminoglycosides (40%) and cephalosporins (10%). Gram positive cocci were sensitive to aminoglycosides(60%) and cephalosporins (50%). Cellulitis is one of the important affliction of skin involving multidrug resistant microbes. In our study most common organism isolated was Pseudomonas species, Mostly sensitive to carbapenems , and resistant to most of the other drugs.

Keywords: Cellulitis, skin and soft tissue infections, Microbiological profile.**Introduction**

Cellulitis is an acute, diffuse spreading infection, involving the deeper layers of the skin and subcutaneous tissue. The Predisposing factors

include Diabetes, obesity and old age. The major symptoms of cellulitis are Erythema, Oedema, Warmth & Tenderness.⁽¹⁾

Cellulitis in turn may induce abscesses and wound infections & diffuse non-suppurative infections of the dermis and subcutaneous tissue.⁽²⁾ Wound infection is one of the most common hospital acquired infections and important cause of morbidity and accounts for 70-80%. The diagnosis - based on clinical manifestations. Constitutional symptoms: Fever, chills, general malaise present in most cases. Fever: may be absent in elderly / Diabetics.⁽³⁾ Cellulitis most typically occurs in the legs and less often in the upper extremity, in the face, or other parts of the body.⁽²⁾

The present study was carried out to isolate different bacteria associated with cellulitis in patients with open wounds and to determine their Antibiotic Susceptibility patterns in order to guide the clinician regarding the prevalent strains and planning the presumptive therapy.

Materials and Methods

This is a prospective study and a total of 100 consecutive in-patients with cellulitis with open wounds were considered for the study. All the patients were in different age groups and admitted in the tertiary care hospital over a 3 months period from September to November 2018. After obtaining informed consent from the patient, the pus sample was collected with two sterile swabs. A fresh oozing zone of the wound was selected to obtain the sample. The samples were immediately transported to the laboratory. Microscopy, with Gram staining was done for all the samples. The samples were immediately inoculated onto blood agar, MacConkey agar and Chocolate agar. Another swab was also inoculated into BHI broth. All the inoculated media are incubated at 37⁰C for 24 hours and observed for the growth. If any growth in the form of colonies was observed on solid media, it was identified using standard bacteriological methods. If there is no growth on solid media, BHI broth was observed for turbidity and streaked onto the solid media (as on day 1). The antibiogram of the identified bacterial strains were carried out by Kirby Baur Disk Diffusion method.⁽³⁾

Results and Discussion

Pus samples from a total of 100 consecutive in-patients with cellulitis with open wounds were processed over a 3-month study period. More number of cases were seen in the age group of 41-60 years (Table 1) and in males (79%).

Table 1: Age Wise Distribution of the study population with cellulitis and open wounds

Sl No	Age group	No of patients presented
1.	10-20 yrs	1
2.	21-30 yr	3
3.	31-40 yrs	9
4.	41-50 yrs	31
5.	51-60 yrs	32
6.	61-70 yrs	19
7.	71-80 yrs	3
8.	81-90 yrs	2
	Total	100

The most common organism isolated was pseudomonas aeruginosa (n= 25, 27%) followed by Klebsiella spp., Escherichia coli, Citrobacter spp., Proteus sp. and Staphylococcus aureus. Acinetobacter sp. was isolated in 2 cases (Table 2).

Table 2 Organisms Isolated from the study population

Sl No	Organisms	Number	Percentage
1.	Pseudomonas aeruginosa	25	27%
2.	Klebsiella species	17	18%
3.	Escherichia coli	15	16%
4.	Citrobacter species	15	16%
5.	Proteus species	12	13%
6.	Staphylococcus aureus	5	6%
7.	Acinetobacter species	2	3%
8.	Total	91	100%

Almost all gram negative isolates showed resistance to Amoxycillin+Clavulanic acid, 90% of the strains were resistant to Cephalosporins, 60% resistant to aminoglycosides. Most of the stains were sensitive to Meropenem (90%). Also the good sensitivity was noted to the combination drugs (90% sensitivity to Cefaperazone+Sulbactam, 80% sensitivity to Piperacillin+Tazobactam). Surprisingly, the strains also showed 90% sensitivity to Fluroquinolones. This could be probably due to decreased use of the

drugs in recent times. Comparatively, the isolates of *Staphylococcus aureus* showed 60% resistance to Penicillin. Cefoxitin screening of the isolates identified 50% of the strains were resistant (indicating Methicillin resistant *Staphylococcus aureus*). All the strains of *S.aureus* showed sensitivity (100%) to Linezolid, Teicoplanin, clincamycin. The strains also showed 100% sensitivity to the Vancomycin (screening using disk diffusion).

The culture positivity rate in the present study (91% of the study population) is comparable to other studies. The study of Sah P et al (2013) revealed 62% positivity of the samples, with 70% of the males in the study population.⁽²⁾ *S.aureus* and *Pseudomonas* sp. were the predominant isolated in their study. In a different study, Zarrin Afroz et al (2015), noted 90% culture positivity in their study population with 74% of males.⁽⁴⁾ *Pseudomonas* sp. and *Escherichia coli* were the predominant isolates in their study. The emergence of the antibiotic resistance strains with gram negative bacilli showing antibiotic resistance ranging from 40-90% to the cephalosporins was noted in several recent studies.⁽⁵⁻¹⁰⁾ This indicates the growing number of antibiotic resistant bacterial strains that are involved in the skin and soft tissue infections.

Conclusions

Pseudomonas aeruginosa and *Klebsiella* species are the predominant organisms. Majority of the cases in present study were males. Most common age group was 41-60years. Maximum resistance of Gram negative organisms were seen against Aminoglycosides (60%), 3rd Generation Cephalosporins like Ceftriaxone, Cefotaxime, Ceftazidime (90%), followed by Amoxicillin-clavulanic acid (100%). Meropenem, Fluoroquinolones, Vancomycin, Teicoplanin could be used for empirical therapy to cover these organisms. Good infection control programs are to be maintained and avoid indiscriminate use of antibiotics. Continued monitoring of Susceptibility pattern need to be carried out so as

to detect the true burden of Antibiotic Resistance in organisms and prevent their further emergence by judicious use of drugs.

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