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Study of Prevalence of Bacterial Species in Pus Samples and Their Antibiotic Sensitivity Pattern in Tertiary Care Hospital, Bhavnagar

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Abstract **Original Research Article**

Background and Objectives: Pus infection is very critical infection and Bacteriological culture is very essential investigation in such patient in tertiary care hospital. Study of different bacterial isolates from pus and its antibiotic sensitivity pattern is very useful guide to clinicians for starting empirical treatment. ***Methods:*** The study was carried out from Jan 2014 to December 2014 in Microbiology dept. at Sir T Hospital Bhavnagar. Total 289 positive pus samples were cultured by conventional methods and antibiotic susceptibility testing was done by Kirby Bauer disc diffusion method as per CLSI guidelines. ***Result:*** Total 289 different bacterial species isolated from pus infection. Amongst Gram negative bacteria most common isolates were E. coli 68(24%) and Klebsiella spp. 93(32%) and Pseudomonas sp. 72 (25%). Amongst Gram positive bacteria most common isolates were Staphylococcus aureus 54(19%). These isolates were sensitive to Vancomycin, Linezolid, 3rd generation Cephalosporin group, Meropenam and Piperacillin-Tazobactum. ***Conclusion:*** Most common bacterial isolates from Wound infection were S. aureus, E. coli, Pseudomonas sp. and Klebsiella sp. The antibiotics that helpful to treat these infections are Vancomycin, Meropenam and Piperacillin- Tazobactum.

Keywords: PTZ- Piperacillin- Tazobactum, E. coli- Escharechia coli.

INTRODUCTION

Wound and soft tissue infection is critical infection in tertiary care hospital. Identification of various bacterial isolates, their prevalence rate and antibiotic sensitivity pattern helps clinician for starting antibiotic therapy. These will also help patient to decrease mortality and morbidity in tertiary care hospital.

If we know the prevalence rate of particular bacterial species in hospital, it helps clinicians to start early antibiotic coverage and helps in early healing of such infection that ultimately helps hospital as well as patients [1].

The aim of this study was to know prevalence rate of various bacterial spp. and their antibiotic sensitivity pattern in pus samples from wound and soft tissue infection in our hospital.

MATERIALS AND METHODS

A study was done on pus samples, collected from different wards and ICU of Sir T Hospital, Bhavnagar during January 2014 to December 2014. Total positive 289 samples of pus were cultured by manual method. Samples were cultured on Blood agar, Nutrient agar and MacConkey agar.

Bacteria were identified by colony morphology, Gram stain, Biochemical reaction, like catalase test, coagulase test, indole, methyl red, voges proskauer test, citrate, urease, oxidase test, triple sugar iron test etc 2].

Positive bacterial isolates were further studied for antibiotic sensitivity testing by manual Kirby bauer disc diffusion method using muller hinton agar using CLSI guidelines [3]. The antibiotics used were penicillin (10 µg), erythromycin (15 µg), gentamycin (10 µg), levofloxacin (5 µg), ampicillin+sulbactum (10+10 µg), vancomycin (30 µg), cefoxitin (30 µg),

teicoplanin (30 µg), linezolid (2 µg), cefotaxime (30 µg), ceftazidime (30 µg), ciprofloxacin (5 µg), peperacillin+tazobactum (110 µg), meropenam (10 µg) etc.

Escherechia coli (ATCC 25922), Pseudomonas aeriginosa (ATCC 27853) and Staphylococcus aureus (ATCC 25923) were used for reference and quality check for culture as well as for antibiotic sensitivity testing [4].

RESULT AND DISCUSSION

In our study of Pus samples, we isolated most common bacterial species as shown below:

Table-1: Different bacterial species isolated from pus sample [5]

Sr No.	Bacterial sp.	No. of Isolates (%)
1	E. coli	68 (24%)
2	Klebseilla	93(32%)
3	Pseudomonas	72(25%)
4	Proteus	02(1%)
5	S. aureus	54(19%)
	Total	289

Amongst gram negative bacteria, Pseudomonas sp. & Klebsiella sp. were most common and amongst gram positive bacteria S. aureus most common, which shows similar result with Salu Rai *et al*., [6].

Table-2: Bacterial species isolated from pus sample from ward

Sr No	Bacterial species isolated	No. of isolates
1	E. coli	22% (58)
2	Klebsiella	32%(84)
3	Proteus	1%(2)
4	Pseudomonas	26%(66)
5	S. aureus	19%(50)

As we studied the prevalence pattern in ward, Klebsiella sp. and Pseudomonas sp. most common compared to gram positive organisms.

Table-3: Bacterial species isolated from pus samples from critical care area

Sr No.	Bacterial species	No. of isolates
1	E. coli	37%(7)
2	Klebsiella	37%(7)
3	Pseudomonas	26%(5)

In critical care area, gram negative bacteria are common compared to gram positive bacteria.

Antibiotic sensitivity pattern

Among Gram positive bacteria 54 species of S. aureus isolated, which shows sensitivity to Vancomycin, Linezolid (100%) and cephalosporin group of antibiotics also. Gram positive bacteria shows resistant to Penicillin group of antibiotic [7].

Among Gram negative bacteria, 3rd generation Cephalosporin group antibiotics and higher antibiotic like Meropenam is effective compared to quinolones group of antibiotic [8].

CONCLUSION

According to geographical area, Prevelance of bacterial infection varies. We want to know this prevelance rate and antibiotic sensitivity pattern in our hospital [9].

In our study, it showed that Klebsiella, E. coli, Pseudomonas and S. aureus were most common bacterial sp. leading to wound infection. They showed sensitivity to Vancomycin, Linezolid, Meropenam and Piperacillin+Tazobactum.

This knowledge really helps clinicians to start antibiotic therapy early and helps in decreasing morbidity of patient as well cost effective for patient and hospital.

REFERENCES

1. Rameshkannan S, Nileshraj G, Rameshprabu S, Mangaiarkkarasi A, MeherAli R. Pattern of pathogens and their sensitivity isolated from pus culture reports in a tertiary care hospital, puducherry. Indian Journal of Basic and Applied Medical Research. 2014;4(1):243-8.

2. Forbes BA, Sahm DF, Weissfeld AS. Bailey and Scott's diagnostic microbiology: A textbook for isolation and identification of pathogenic microorganisms 11th edition. St. Louis, editor. The mosby company. CV Mosby. 2002:378-422.
3. Wayne PA. Clinical and Laboratory Standards Institute: Performance standards for antimicrobial susceptibility testing: 20th informational supplement. CLSI document M100-S20. 2010.
4. Dryden MS. Complicated skin and soft tissue infection. Journal of antimicrobial chemotherapy. 2010 Nov 1;65(suppl_3):iii35-44.
5. Khanam RA, Islam MR, Sharif A, Parveen R, Sharmin I, Yusuf MA. Bacteriological Profiles of Pus with Antimicrobial Sensitivity Pattern at a Teaching Hospital in Dhaka City. Bangladesh Journal of Infectious Diseases. 2018 Aug 4;5(1):10-4.
6. Rai S, Yadav UN, Pant ND, Yakha JK, Tripathi PP, Poudel A, Lekhak B. Bacteriological profile and antimicrobial susceptibility patterns of bacteria isolated from pus/wound swab samples from children attending a tertiary care hospital in Kathmandu, Nepal. International journal of microbiology. 2017.
7. Tiwari P, Kaur S. Profile and sensitivity pattern of bacteria isolated from various cultures in a tertiary care hospital in Delhi. Indian journal of public health. 2010 Oct 1;54(4):213.
8. Lakhey M, Bhatt CP. The distribution of pathogens causing wound infection and their antibiotic susceptibility pattern. Journal of Nepal Health Research Council. 2008 Dec 30.
9. Misic AM, Gardner SE, Grice EA. The wound microbiome: modern approaches to examining the role of microorganisms in impaired chronic wound healing. Advances in wound care. 2014 Jul 1;3(7):502-510.