

Bacteriological Profile And Antimicrobial Susceptibility Among Isolates Obtained From Body Fluids At A Tertiary Care Centre.

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Abstract

BACKGROUND: Body fluids like pleural fluid, peritoneal fluid, CSF, synovial fluid and pericardial fluid are usually sterile. Infections of sterile body fluids are a medical emergency and needs an early diagnosis and effective treatment. There are certain common pathogenic bacteria like *Escherichia coli*, *Klebsiella* species, *Pseudomonas* species, *Acinetobacter*, *Staphylococcus aureus* which invade and infect the sterile body fluids leading to morbidity and life threatening infections.

METHOD: A total of 380 sterile body fluids were collected from August 2019 to October 2019. Sterile body fluids like cerebrospinal fluid, pericardial fluid, pleural fluid, peritoneal fluid, bile, synovial fluid were included. They were processed using conventional microbiological methods and pathogens isolated & their antibiotic susceptibility testing was done by Kirby- Bauer disc diffusion method.

RESULT: Among 380 samples culture positivity was observed in 11(2.8%) samples and remaining 369(97.2%) were sterile even after 48 hours of incubation. The isolates were both Gram positive and Gram negative. *Escherichia coli* was predominately isolated from peritoneal fluid 4(1.05%) samples, whereas *Staphylococcus aureus* isolated from synovial fluid 3(0.78%) samples, *Pseudomonas* species from bile 2(0.52%) & others 0.52%. *Escherichia coli* showed sensitivity to imipenem, *Pseudomonas* was sensitive to third generation cephalosporin and *staphylococcus aureus* was sensitive to linezolid & teicoplanin.

CONCLUSION: The knowledge of incidence, microbial profile and antibiotic resistance pattern of sterile body fluids helps in proper clinical management and taking timely preventive measures.

Key Words: Sterile body fluids, antibiotic sensitivity, Gram negative bacilli, Gram positive cocci

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I. Introduction

Sterile body fluid infections are life threatening and have clinical emergency¹ Body fluids like CSF, pleural fluid, pericardial fluid, peritoneal fluid, synovial fluid, bile are mostly sterile². The common pathogenic bacteria like *Escherichia coli*, *Klebsiella* spp, *Pseudomonas*, *Acinetobacter*, *Staphylococcus aureus*, *Enterobacter* infect body fluids and can cause morbidity³.

There is a requirement of regular surveillance of bacteriological profile and antibiogram of organisms isolated from sterile body fluids and the results to be informed to clinicians⁶. This knowledge helps in early diagnosis, prompt treatment and also in preventing antibiotic resistance. Hence this study was done to know the bacteriological profile and antibiotic susceptibility of organisms isolated from sterile body fluids.

II. Materials And Methods

The present retrospective study was carried out at Osmania General Hospital, Afzalgunj, Hyderabad, Telangana from August 2019 to October 2019 after obtaining institutional ethical committee approval. A total of 380 samples from both sexes aged between 16-60yrs and giving consent were included in the study.

All the samples like CSF, pericardial fluid, pleural fluid, ascitic fluid, synovial fluid and bile were subjected for microscopic examination by Gram's stain and culture and sensitivity by standard methods. All the isolates were identified by standard biochemical tests and their antibiotic susceptibility testing was performed by Kirby Bauer disk diffusion method and interpreted as per Clinical and Laboratory Standards Institute (CLSI) guidelines.

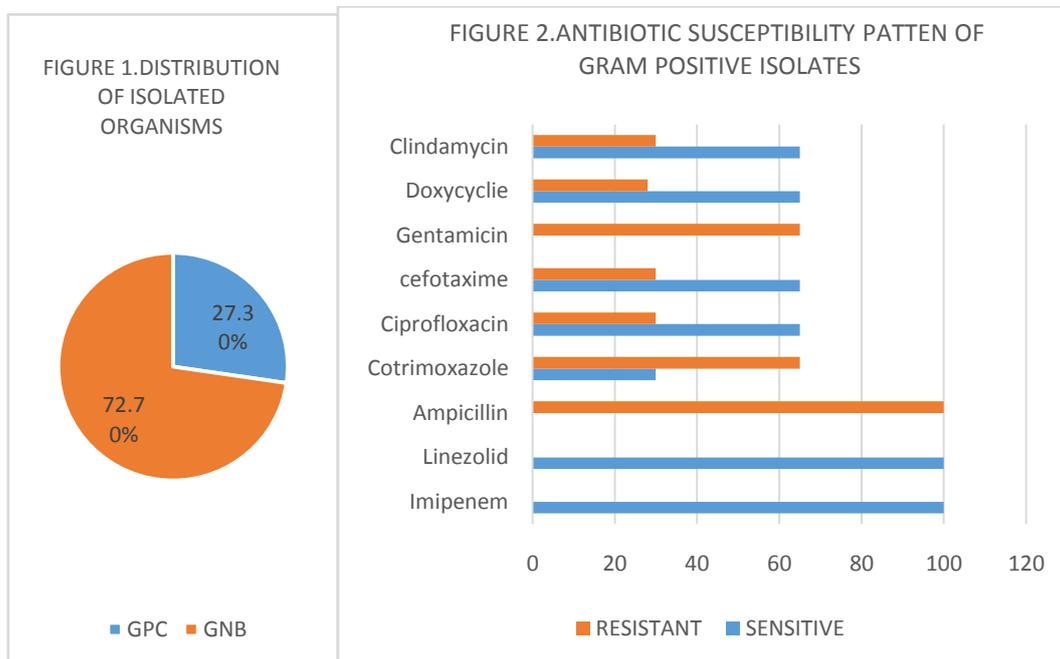
III. Results

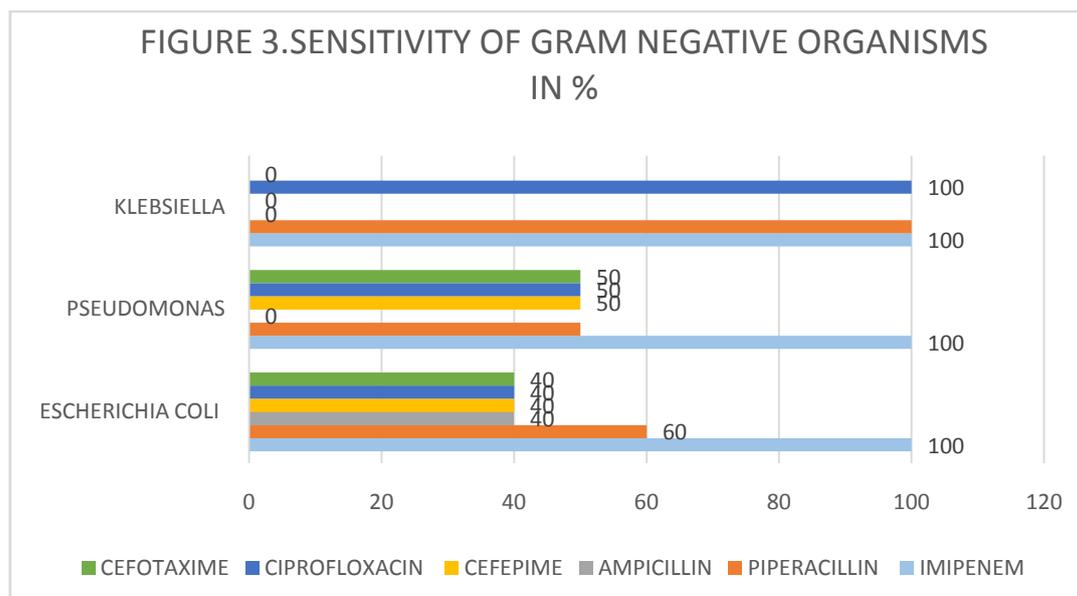
A total of 380 samples were received during August 2019 to October 2019 in Microbiology department. Amongst 380 samples 11 samples showed growth of organisms and the remaining 369 samples were sterile after 48 hrs of incubation. The culture positive rate was 2.8%.

Table 1. Bacteriology of body fluids

Fluids (no of samples)	Ascitic fluid (170)	Pleural fluid (133)	CSF (46)	Synovial fluid(17)	Bile(13)	Pericardial fluid(1)	Total(380)
Escherichia coli	3	1	0	0	1	0	5(45.4%)
Pseudomonas sps	1	0	0	0	1	0	2(18.18%)
Klebsiella pneumoniae	0	1	0	0	0	0	1(9.09%)
Staphylococcus aureus	0	0	1	2	0	0	3(27.27%)
Total	4(36.36%)	2(18.18%)	1(9.09%)	2(18.18%)	2(18.18%)	0	11

Among 380 body fluid samples, the majority of samples were ascitic fluid (44.7%), followed by CSF samples (35%), pleural fluid (12.1%), synovial fluid (4.47%), bile (3.42%) and least were pericardial fluid (0.2%). The predominant organism isolated from ascitic fluid was Escherichia coli. From pleural fluid Escherichia coli and Klebsiella pneumoniae were isolated. From the synovial fluid and CSF the organism isolated was Staphylococcus aureus. From the 11 culture positive samples, mostly Gram negative organisms (72.7%) were isolated and the remaining were Gram positive organisms (23.7%) as shown in (figure 1). The Gram negative organisms were Escherichia coli, Klebsiella spp, Pseudomonas spp, which were sensitive to carbapenems (100%) and fluoroquinolones and showed some resistance to cephalosporins shown in (figure 3). The gram positive organism was Staphylococcus aureus and was susceptible to broad spectrum antibiotic like linezolid and carbapenems (100%) and resistant to ampicillin (100%) as shown in (figure 2).





IV. Discussion

Early detection and identification of microorganisms are crucial for appropriate management of infections of sterile body fluids. The present retrospective study was conducted at a tertiary care hospital, comprising 380 various body fluids, with isolation rate of 2.8% which correlates with the study done by Mariya et al., (10.8%)¹.

Gram negative organism isolation rate was 72.7% in concordance with study done by Mariya et al 70%³ and Sodani et al 83.62%. Predominant organism isolated was Escherichia coli from ascitic fluid in concordance with study done by Vijaya et al¹.

In the present study Staphylococcus aureus was isolated from synovial fluid. In present study Escherichia coli and Klebsiella sps were sensitive to imipenem (100%) and showed resistance to ampicillin (100%) and cefotaxime (60%) correlating with study done by Harshika et al⁴.

Pseudomonas was sensitive to imipenem (100%) and piperacillin and tazobactam (50%) and resistant to ampicillin (100%) similar with study done by Rajani et al¹⁰. Staphylococcus aureus showed susceptibility to linezolid (100%), imipenem (100%), cephalosporins (67%) and fluoroquinolones (67%) resistance to ampicillin (100%) gentamycin (67%). correlating with study done by Vijaya et al¹.

V. Conclusion

The knowledge of bacteriological profile helps the clinicians in providing appropriate treatment. Knowing the antimicrobial sensitivities help in using appropriate antibiotics and in preventing drug resistance.

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