



## Original Research Article

# Aerobic Bacterial Profile and antibiotic sensitivity pattern of pus isolates in a tertiary care Hospital

M. Chauhan<sup>1\*</sup>, Manish S<sup>2</sup> and S. Mahajan<sup>3</sup>

Department of Microbiology of Microbiology Dr Rajendra Prasad Govt Medical College  
Kangra at Tanda (H.P), India

\*Corresponding author

## ABSTRACT

### Keywords

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Resistance

This Study was under taken to determine the antibiotic sensitivity patterns of frequently isolated organism from pus culture, so that it helps to manage the drug resistant organism well in time which poses challenge to clinician to treat the patients. Total 200 isolates were related during 6 months period 2013-2014. To study antibiograms of various organisms. Organisms were identified as per standard operative procedure and drug sensitivity was done as per CLSI guidelines. Most commonly encountered organism was *Staph. aureus* followed by *Pseudomonas*, *E.coli* and *Klebsiella* either alone or mixed growth *Staph. aureus* was showing sensitivity towards vancomycin, clindamycin and cefoxitin whereas gram negative organisms were showing sensitivity towards Imipenem. Antimicrobial resistance is a predictable outcome of antimicrobial use. lengthy or inappropriate antimicrobial therapy allow microbes to mutate into new forms that help them to survive antibiotic treatment and quickly become dominate strain knowledge of common pathogens and their resistance status can guide clinician to choose appropriate antibiotic for empirical treatment of patients.

## Introduction

Infections of soft tissue are generally associated with the production of pus and bacteria involved are said to be pyogenic (pus producing). Wide variety of aerobic and anaerobic species of bacteria may be present either singly or in combination in infections of wounds and others soft tissues, some infection resolve without specific therapy but some infection especially mixed infection can cause severe synergic infections calling for prompt antibiotic therapy [1]. Various studies across the

World have shown periodic monitoring of the bacterial profile in the pyogenic wound infections, which is helpful for the empirical treatment of the patients. The present study was also done to monitor the aerobic bacterial profile and study of their antibiogram in our region.

## Materials and Methods

The study included the samples over a period of 6 months. Total 200 positive

samples were selected which were received by bacteriology section of microbiology department from various departments. Standard diagnostic procedures were followed.

### Collection of specimen

Pus from abscess is best collected at the time the abscess is incised and drained using sterile technique or collect from drainage tube up to 5 ml pus, transfer to sterile containers. Received pus samples were processed on Blood agar, Chocolate agar, MacConkey agar, Nutrient agar and incubated at 37°C under aerobic conditions and organisms were identified by biochemical reactions Gram stain and motility test as per standard operative procedure. AST was done by Kirby Bauer's disk Diffusion method and interpreted as per CLSI guidelines. Standard antibiotics like.

Penicillin (10µg), Vancomycin (30µg), Gentamycin (10µg), Ciprofloxacin (5µg), Clindamycin (2µg), azithromycin (15µg), cefoxitin (30µg), piperacillin (100µg), ceftazidime (30µg), cotrimoxazole 5/2375 Ticracillin (75µg), Imipenem (10µg) were used from HIMEDIA. Results obtained were analysed, susceptibility pattern were studied and percentage was calculated.

### Results and Discussion

Out of total positive 200 isolates most common isolates was *Staph.aureus* i.e 46% out of which 85% of Staph were present singly and 15% in mixed growth 2<sup>nd</sup> most common isolates were gram negative bacteria *Pseudomonas* and *E.coli* i.e 20.5% and 20.5%. 80. 48% of *Pseudomonas* present singly and 19.52% showing mixed growth 70.73% of *E.coli* were present singly and

29.26% were showing mixed growth 6% showing *Klebsiella* alone or in combination. 5% *Citrobacter*, 2% *Acinetobacter*, 3% nonfermenters, 4% *Enterococcus*, 2% *Strepto coccus* 0.5% *Morgenella*, 0.5 *Providencia* group.

The observation of this study very well coincide with the works reported by various authors across the country *S.aureus* was found to be the most commonly occurring pathogen in study group Tiwari et al.[2] Agnithori et al found it to be second most common isolate after *pseudomonas* spp.[3]. Gram negative bacilli dominance in the aerobic growth in pus has been highly recorded by studies reported by Ghosh et al and Zubair et al. [4,5]. Another study of Basus et al. [6] also reported *pseudomonas* and *E.coli* spp to be the most commonly occurring pathogens in wound infection. Anti biogram of gram positive cocci revealed that they show susceptibility towards vancomycin, cefoxitin, clindamycin, gentamycin, Azithromycin, ciprofloxacin but resistance towards penicillin. Whereas gram negative bacilli showing good response towards Imipenem, Gentamycin, ciprofloxacin. Cephalothin, cefeximine and *Pseudomonas* are susceptible to piperacillin, ceftazidime, imipenem. All these study were in agreement with the study by Suguneswari et al. [7,8].

Organism evolve resistance mechanism as soon as antibiotics are introduced for treatment purpose. Emergence of drug resistant strains along with non-availability of new antibiotics leads to complication in managing the infection, for that we require a periodic monitoring of clinical samples so that appropriate choice of drug can limit such infections which appear to be great threat to physicians in patient care.

Aerobic bacteria in N=200 isolate from pus samples

S. No	Organism	Number	%
1	<i>Staph aureus</i>	92	46%
2	<i>Pseudomonas</i>	41	20.5%
3	<i>E.coli</i>	41	20.5%
4	<i>Klebsiella</i>	12	6%
5	<i>Citrobacter</i>	10	5%
6	<i>Proteus</i>	8	4%
7	<i>Enterococcus</i>	6	3%
8	<i>Acinetobacter</i>	4	2%
9	<i>Non fermenters</i>	6	3%
10	<i>Morganella</i>	1	0.5%
11	<i>Providencia</i>	1	0.5%

Antibiogram of *Staph. aureus*

Name of antibiotics	Staph aureus N=92	
	R	S
Penicillin	80.43%	19.57%
Vancomycin	9.78%	90.22%
Gentamycin	14.13%	85.87%
Ciprofloxacin	45.65%	54.35%
Clindamycin	20.65%	79.35%
Azithromycin	33.69%	66.31%
Cefoxitin	20%	80%

Antibiogram of *Pseudomonas*

Name of antibiotics	<i>Pseudomonas</i> N=41	
	R	S
Piperacillin	43.90%	56.1%
Ceftazidime	48.78%	51.22%
Gentamycin	70.73%	29.27%
Cotrimoxazole	100%	0%
Ticarcillin	72%	28%
Imipenem	4.17%	95.83%

Antibiogram of Enterobacteriaceae

Name of antibiotic	<i>E.coli</i> N=41		<i>Klebsiella</i> N=12		<i>Citrobacter</i> N=10	
	R	S	R	S	R	S
Cephalothin	-	-	40%	60%	80%	20%
Ceftazidime	56.09%	43.91%	66.66%	33.34%	50%	50%
Gentamycin	46.34%	53.66%	63.63%	36.37%	60%	40%
Ciprofloxacin	65.85%	34.15%	27.27%	72.73%	50%	50%
Cefoxitin	63.41%	36.59%	44.44%	55.56%	80%	20%
Imipenem	12.2%	87.80%	0	100%	0	100%

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