



## Prevalance of *Pseudomonas Aeruginosal* Infections- A Hospital Based Study

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### ABSTRACT

**INTRODUCTION :** *P. aeruginosa* is deadly infectious agent which is gram negative bacilli. Found in warm moist area such as sinks, drains, respirators, humidifier and disinfectant. *P. aeruginosa* found in normal microbial flora in humans i.e., in skin, nasal mucosa, throat and fecal samples.

**OBJECTIVES :** Isolate and identify the *P. aeruginosa* from various clinical samples and study the prevalence of *P. aeruginosa* among various samples.

**METHODS :** Nutrient agar, 5% Blood agar used for both culture characteristic and pigment production, Gram staining, Hanging drop test for motility, etc. were used to isolate and identification of the *P. aeruginosa*.

**RESULT :** Total of 70% males patients have been detected infection caused by *P. aeruginosa*. Between 11-20 age group patients have high degree of prevalence of infection followed by elder age group. Ear swab (26%) and Pus (30%) from which the most positive samples has been isolated. *P. aeruginosa* was common in male patients. Maximum number of isolated obtained from the patients between 11-20 years and Pus samples have prevalence than that of ear swab.

**CONCLUSION:** The study is helpful for the diagnosis and treatment against the *P. aeruginosa*.

**KEYWORDS :** *Pseudomonas aeruginosa*, Ear Swab and Pus

### INTRODUCTION:

*Pseudomonas aeruginosa* is non fermentative gram negative bacilli which is aerobic, non-spore forming bacilli that either do not use carbohydrate as a source of energy or degrade them through metabolic pathways other than fermentation.<sup>1</sup> *Pseudomonas aeruginosa* cause serious infections in hospitalized patients. Treatment of these infections often complicated because of increasing bacterial resistance mediated by varying degree of beta lactamases enzymes, it is not unusual to find single isolate that express multiple beta lactamases enzymes further complicated the treatment options.<sup>2</sup> *Pseudomonas aeruginosa* is saprophytic, normally inhabits the soil.<sup>3</sup> It is also found in warm moist the human environment including sinks, drains, respirators, humidifiers and disinfectant.<sup>4</sup>

*Pseudomonas aeruginosa* is frequent cause of nosocomial infections which are complicated and can be life-threatening.<sup>5</sup> *Pseudomonas aeruginosa* is responsible for 16% of nosocomial pneumonia<sup>6</sup>, 12% of hospital acquired urinary tract infection<sup>7</sup>, 10% blood stream infections<sup>8</sup> and 8% surgical wound infections.<sup>9</sup>

*P. aeruginosa* is seldom a member of the normal microbial flora in humans. Representative colonization rates for specific sites in humans are 0 to 2% for skin, 0 to 3.3% for the nasal mucosa, 0 to 6.6% for the throat, and 2.6 to 24% for fecal samples.<sup>10</sup>

#### Various clinical spectrum of *Pseudomonas aeruginosa*<sup>11</sup>

- Infections more commonly in patients with neutropenia, cystic fibrosis and those on ventilators.
- UTI following catheterisation
- Acute purulent meningitis following lumbar puncture
- Post tracheostomy pulmonary infection.
- Septicemia in patients who are debilitated due to malignancy or immunosuppressive therapy.
- Wound and burn infections
- Chronic otitis media and otitis externa
- Eye infections
- Acute necrotising vasculitis which leads to hemorrhagic infection of skin and internal organs
- Infantile diarrhea
- Bacteremia: patients are usually febrile, but those who are most severely ill may be in shock or even hypothermic
- Bone and joint infections

- CNS infection
- Infections in patients with AIDS.

#### AIM:

-Isolation and identification of *P. aeruginosa* from various clinical samples.

-To study the prevalence of *P. aeruginosa* among various clinical samples.

#### METHOD:

The present study was carried out on 300 non-repetative clinical isolates of *Pseudomonas aeruginosa* from OPD and IPD of NIMS Medical College & Hospital, Jaipur. *Pseudomonas aeruginosa* isolates that are considered clinically relevant and all age group and both sex were included various clinical specimens include urine, body fluids, pus, sputum, swabs, ET secretion, ear swabs etc. samples were collected from the patient of Outpatients departments and inpatient department at various wards. Baseline data was collected, enclosed Performance was filled. Each specimen was assigned a unique number that links a specimen to patient with aseptic precautions and transported to the Microbiology laboratory.

All clinical samples were processed immediately and routine culture as per standard protocol:

1. Culture characteristic: nutrient agar and 5% blood agar
2. Pigment production: Blood agar and Nutrient agar
3. Gram's stain
4. Motility: Hanging drop preparation.
5. Oxidase test; etc.

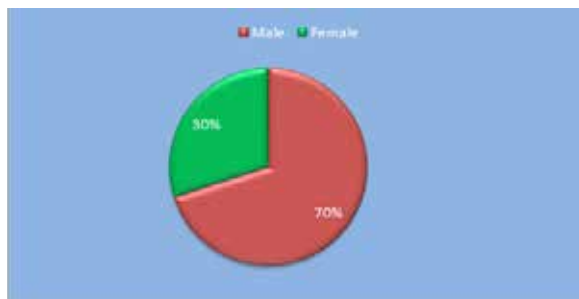
#### RESULT & DISCUSSION:

During the study period, 300 positive sample of *Pseudomonas aeruginosa* were isolated from various clinical specimens of patients of all ages and both sexes attending various outpatients, Inpatients and ICUs at various hospitals and nursing homes were processed

**TABLE 1: Sex Wise Distribution of *Pseudomonas aeruginosa***

Sex	No. of isolates (n=300)	Percentage (%)
Male	210	70%
Female	90	30%

As shown in Table 1: Out Of total 300 isolates of *Pseudomonas aeruginosa*, 210(70%) isolates from male while 90 (30%) from female patients.

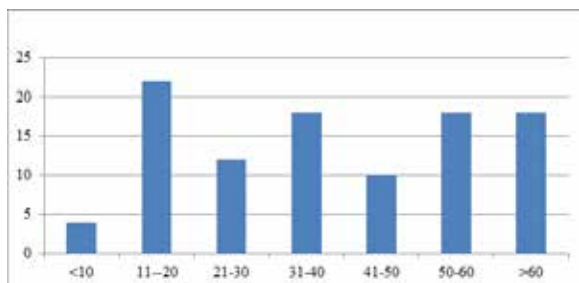


**Figure 1: Sex Wise Distribution of *Pseudomonas aeruginosa*.**

**TABLE 2: Age Wise Distribution of *Pseudomonas aeruginosa*.**

Age(yrs)	Isolates (n=300)	Percentage (%)
<10	12	4%
11-20	66	22%
21-30	36	12%
31-40	54	18%
41-50	30	10%
50-60	54	18%
>60	54	18%

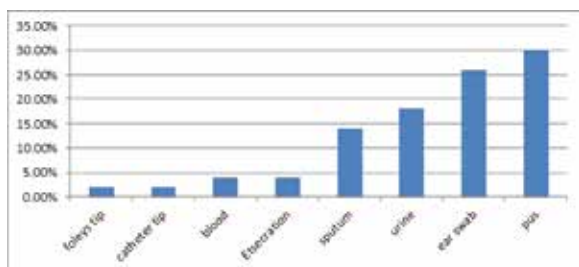
As shown in Table 2: out of total 300 isolates of *Pseudomonas aeruginosa*, maximum isolates from age group between 11-20 yrs i.e 22% while minimum from <10 yrs of age i.e. 4%.



**FIGURE 2: Age Wise Distribution of *Pseudomonas aeruginosa***

**TABLE 3. Types of Clinical Samples From which *Pseudomonas aeruginosa* were isolated**

Clinical specimens	No. of isolates (n=300)	%
Foley's tip	6	2
Catheter tip	6	2
Blood	12	4
ET secretion	12	4
Sputum	42	14
Urine	54	18
Ear swab	78	26
Pus	90	30



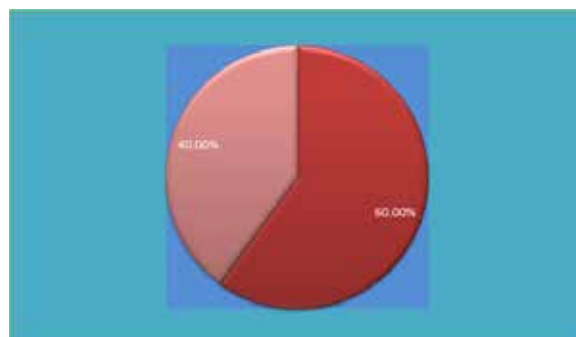
**FIG. 3. Types of Clinical Samples From which *Pseudomonas aeruginosa* were isolated**

Above the figure shows that *Pseudomonas aeruginosa* isolated maximum from pus samples i.e. 90 followed from ear swab 78, 54 from urine, 42 from sputum, 12each from E.T. secretion and blood, least from Foley's tip and catheter tip 6 each.

**TABLE 4:- Distribution of *Pseudomonas aeruginosa* among Patients of IPD/OPD**

Department	No. of isolates (n=300)	Percentage
IPD	180	60%
OPD	120	40%

As shown in table 4:Out of total 300 isolates, 180 from IPD and 120 from OPD .



**Figure 4:- Distribution of *Pseudomonas aeruginosa* among Patients of IPD/OPD**

In the present study, *Pseudomonas aeruginosa* was common in male patients i.e 70% as compared to female patients i.e 30%.. Similar observation of male prepondance was made Arora D et al (2010)<sup>12</sup>, Flegoo et al(2014)<sup>13</sup> and Anurave K et al (2013).<sup>14</sup> In the present study out of 300 *P. aeruginosa*, most of patients 66(22%) were aged between 11-20 yrs. Which was comparable to Arunava K et al 2013<sup>14</sup> study showed lower sensitivity against 6-18 yrs 10.2%.

In the present study, among the 300 *Pseudomonas aeruginosa* isolates it was common from IPD 60% followed by OPD 40%.Which was correlated with study of Flegoo et al 2014<sup>13</sup> which showed maximum isolates from IPD i.e 62%. In the present study, out of 300 *Pseudomonas aeruginosa* isolated from various clinical samples,maximum no. isolated from pus 90(30%) followed by ear swab 78(26%), which was correlatewell with Anurava d K et al (2013)<sup>14</sup> maximum no. isolated from pus 27(55.1%). Sharma A et al (2012)<sup>15</sup>, 90 (39.1%) were from urine followed by 55(23.9%) from pus. Shaikh S et.<sup>16</sup> al(2015) 9(20.45%) urine, 4(13.79%) blood, 19(28.36%), sputum 10(41.65%) and other 5(21.74%).

**CONCLUSION:**

The study is very useful for the diagnosis of patients suffering from infections caused by *Pseudomonas aeruginosa* also play the important role for treatment by clinicians as infections caused by *Pseudomonas aeruginosa* are common now-a-days.

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