Prevalence of Pseudomonas Aeruginosa Infections- A Hospital Based Study

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ABSTRACT

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

OBJECTIVES: Isolate and identify the Paeruginosa from various clinical samples and study the prevalence of Paeruginosa 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 Paeruginosa.

RESULT: Total of 70% males patients have been detected infection caused by Paeruginosa. 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 Paeruginosa.

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.1 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.2 Pseudomonas aeruginosa is saprophytic, normally inhabits the soil.3 It is also found in warm moist the human environment including sinks, drains, respirators, humidifiers and disinfectant.4

Pseudomonas aeruginosa is frequent cause of nosocomial infections which are complicated and can be life-threatening.5 Pseudomonas aeruginosa is responsible for 16% of nosocomial pneumonia,12% of hospital acquired urinary tract infection,10% blood stream infections2 and 8% surgical wound infections.5

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.10

Various clinical spectrum of Pseudomonas aeruginosa:11
- CNS infection
- Infections in patients with AIDS.

AIM:

- Isolation and identification of Pseudomonas aeruginosa from various clinical samples.
- To study the prevalence of Pseudomonas 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 Form 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 nurser 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.

![Sex Wise Distribution of Pseudomonas aeruginosa](image1)

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

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>Isolates (n=300)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10</td>
<td>12</td>
<td>4%</td>
</tr>
<tr>
<td>11-20</td>
<td>66</td>
<td>22%</td>
</tr>
<tr>
<td>21-30</td>
<td>36</td>
<td>12%</td>
</tr>
<tr>
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<td>54</td>
<td>18%</td>
</tr>
<tr>
<td>41-50</td>
<td>30</td>
<td>10%</td>
</tr>
<tr>
<td>50-60</td>
<td>54</td>
<td>18%</td>
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<tr>
<td>&gt;60</td>
<td>54</td>
<td>18%</td>
</tr>
</tbody>
</table>

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%.

![Age Wise Distribution of Pseudomonas aeruginosa](image2)

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

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

<table>
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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%.

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

<table>
<thead>
<tr>
<th>Department</th>
<th>No. of isolates (n=300)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPD</td>
<td>180</td>
<td>60%</td>
</tr>
<tr>
<td>OPD</td>
<td>120</td>
<td>40%</td>
</tr>
</tbody>
</table>

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)12, Flegoo et al(2014)13 and Anurave K et al (2013).14 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 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 201414 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)18 maximum no. isolated from pus 27(55.1%). Sharma A et al (2012)19, 90 (39.1%) were from urine followed by S5(23.9%) from pus. Shaikh S et.16 al(2015) 9(20.45%) urine, 4(13.79%) blood, 19(28.36%), sputum 10(41.65%) and other S(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.

**REFERENCES:**


