COMMUNITY ACQUIRED PNEUMONIA: BACTERIOLOGY AND ANTIMICROBIAL SENSITIVITY TESTING

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ABSTRACT

Pneumonia is a major disease of children which is caused by mainly by *Streptococcus pneumoniae*. The incidence of the disease is worldwide, approximately 1.1 million deaths annually are attributed to *S. pneumoniae* infection. *Pneumococcus* infect more in males than females, the age group at child age and old age patients more prone to pneumococcal infection due to their immature and decreased immunity. The immunity play major role in preventing infection. The antibiotic like Ampicillin/Sulbactam, linezolid, Cefotaxime and Lincomycin are the drug which showed sensitivity to *Pneumococci*.

Keywords: Pneumonia, antibiotic sensitivity test, India ink preparation, Navi Mumbai.

INTRODUCTION

*Streptococcus pneumoniae* is an important human pathogen which is major causative agent of pneumonia and other diseases including otitis media, acute bacterial sinusitis, meningitis, bacteremia, and. The incidence of the disease is worldwide, approximately 1.1 million deaths annually are attributed to *S. pneumoniae* infection [1]. *S. pneumoniae* is among the most common microorganisms isolated from otitis media specimens [2]. *S. pneumoniae* has been cultured from approximately 40% of middle ear fluid samples which is taken from patients having acute otitis media [3, 4]. Common cold and otitis media is the most commonly diagnosed childhood illness in the United States. Otitis media is a clinical diagnosis and the most prevalent infectious disease in children which is characterized by the accumulation of
fluid in the middle ear space. Approximately one-third of all children experience three or more episodes of acute otitis media by the age of 3 years \[5\]. The conductive hearing loss is a major consequence of otitis media, may affect the child’s behavior, education, or development of language and skills \[6,7\]. The socioeconomic impact of otitis media is staggering, with annual costs exceeding $5 billion in the United States alone \[8\].

Asymptomatic carriage in the nasopharynx, particularly in children, is believed to be the reservoir of \textit{Streptococcus pneumoniae}, a strictly human pathogen. Under predisposing conditions, such as a viral respiratory infection, smoking, or certain chronic illnesses, Pneumococci can provoke serious infections such as otitis media, pneumonia, bacteremia, and meningitis. The majority of colonizing \textit{Streptococcus pneumoniae} have been shown to contain prophages or remnants thereof when examined with a DNA probe specific for the major autolysin lytA, which hybridizes to lytic enzyme genes of temperate pneumococcal phages because of their relative sequence similarity \[9,10,11,12\].

**MATERIALS AND METHODS**

This prospective study was carried out at Microbiology laboratory, MGM Hospital, Navi Mumbai, India. Total 100 sputum samples were taken from patients attending OPD of Medicine department. The samples were processed as physical examination (presence of blood, mucous, saliva, colour of the sputum samples), Gram staining and microscopic examination (presence of pus cells, epithelial cells, bacteria- Gram negative/Gram positive – cocc / bacilli), specimens were directly inoculated onto sheep blood agar plate, MacConkey’s agar plate, nutrient agar plate and Columbia blood agar. Isolated colonies were identified by standard biochemical tests. The antibiotic sensitivity test was done by Kirby Bauer disc diffusion method.

**RESULTS**

Table no. 1 showing prevalence of Pneumococci in different age groups.

<table>
<thead>
<tr>
<th>Age groups (years)</th>
<th>Males (N=69)</th>
<th>Females (N=31)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 – 15</td>
<td>12 (17.39)</td>
<td>6 (19.34)</td>
<td>18</td>
</tr>
<tr>
<td>15 – 25</td>
<td>8 (11.59)</td>
<td>7 (22.58)</td>
<td>15</td>
</tr>
<tr>
<td>25 – 35</td>
<td>2 (2.89)</td>
<td>1 (3.22)</td>
<td>3</td>
</tr>
<tr>
<td>35 – 45</td>
<td>1 (1.45)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Antibiotic drugs</td>
<td>Pneumococcus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>--------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentration</td>
<td>AS 20 mcg (%)</td>
<td>LZ 30 mcg (%)</td>
<td>CF 30 mcg (%)</td>
</tr>
<tr>
<td>N= 100</td>
<td>100</td>
<td>100</td>
<td>93</td>
</tr>
<tr>
<td>Percentage (%)</td>
<td>(100)</td>
<td>(100)</td>
<td>(93)</td>
</tr>
</tbody>
</table>

**Abbreviation for Antibiotic** – AS= Ampicillin/Sulbactam, BA= Co-trimoxazole, CF= Cefotaxime, LZ= Linezolid, GM= Gentamicin, LM=Lincomcin, AT= Roxithromycin, TE= Tetracycline, RC= Ciprofloxacin.

**DISCUSSION AND CONCLUSION**

Our study showed that community acquired pneumonia due to *Pneumococcus* bacterial infection occurs more in males than in females. The age group which is more prone to infection i.e. paediatric age group and elderly age group, in young age group which is from 25 – 45 years showed low infection rate as compared to child and old age group. The infection occurs more in children due to their immature immunity and in case of old age group the immunity is diminished.

Our study showed that the antibiotic sensitivity pattern of common used antibiotics at tertiary care centre in India i.e. ampicillin/sulbactam, linezolid, Cefotaxime and lincomcin are sensitive to Pneumococci whereas Tetracycline Co-trimoxazole was resistance. Antibiotic sensitivity report is must required before starting antibiotics to the patients.

**REFERENCES**