**PULMONARY NOCARDIOSIS IN IMMUNOCOMPROMISED PATIENTS OF BIKANER**

*Swami Taruna, Pannu Sanju and Sharma B.P.*

*Department of Microbiology, S.P. Medical College, Bikaner*

*Author for Correspondence*

**ABSTRACT**

A total of 26 isolates of Nocardia were obtained from 700 pulmonary specimens from all age group and both sexes over a period of one year from August 2012 to July 2013. Maximum number of Nocardia were recovered from sputum (96.15%) followed by pleural fluid (3.85%). Highest incidence was observed in people more than 50 yr age group and males were more infected than females. Risk factors were COPD, pulmonary tuberculosis, Prolong use of corticosteroids & chemotherapeutic agents, pneumonia, bronchial asthma, DM and immunocompromised status. Most of the isolates were sensitive to a mikacin.imipenem, ceftiaxone, cotrimoxazole, ciprofloxacin, azithromycin and doxycycline.

**Key Words**: Nocardia

**INTRODUCTION**

Pulmonary Nocardiosis is an important cause of opportunistic infection in immunocompromised patients and also affect nonimmunocompromised host, thereby the incidence is increasing day by day. Pulmonary Nocardiosis manifest as an acute, subacute or chronic infection with a marked tendency towards remissions and exacerbations which initially may mimic pneumonia, tuberculosis, carcinoma or lung infection (Dias et al., 2009). Pulmonary Nocardiosis is more common clinical type than cutaneous type and is always present in patients with underlying risk factors (Brown-Elliot et al., 2006). Pulmonary Nocardiosis is difficult to diagnose on the basis of clinical and radiological findings alone. A high level of suspicion is required in patients with risk factors whom no other microorganism have been identified (Menendez, 1997). It is often falsely diagnosed as pulmonary tuberculosis and treated with antitubercular drugs, such cases may end fatally. The incidence of Nocardia infection has increased since 1960. The reason may be improved diagnostic tests, increasing use of immunosuppressive therapy and growing population of immunocompromised individuals (Dias et al., 2009). Since substantial studies have not undertaken on incidence and antimicrobial susceptibility pattern of pulmonary Nocardiosis in immunocompromised patients of Rajasthan, therefore the present study has been conducted to find out the incidence of Pulmonary Nocardiosis in immunocompromised patients along with antimicrobial drug susceptibility pattern.

**MATERIALS AND METHODS**

The present study was conducted in Department of Microbiology, S.P. Medical College, Bikaner from August 2012 to July 2013 to find out the incidence of pulmonary Nocardiosis in this arid zone, various respiratory samples from different outpatients departments and wards of PBM Hospital were collected. The clinical specimens in present study were sputum, pleural fluid, bronchial aspirate and broncho-alvelolar levage. Medical and demographic data of patients were collected using a questionnaire. All the samples were processed in laboratory without delay in order to avoid contaminants to grow. Homogenization of sputum samples done by concentration methods (Arora, 2008). Direct microscopy was done after KOH Mount, Grams staining, modified Z.N. Staining (1% H2SO4 was used as deolouriser). Specimen was inoculated in Thioglycolate broth, Nutrient agar, Blood agar, Lowensen Jensen media.Sabourad dextrose agar and Brain heart infusion agar. Cultures were examined daily for the growth of Nocardia species which were identified by their morphological (Figure 1 & 2) and colony characters using standard procedures (Manual, 1963) Antimicrobial sensitivity of each isolate was carried...
out on Muller Hinton agar by KirbyBauer disc diffusion method as per CLSI recommendation using antibiotic disc Co-trimoxazole(25µg), Amikacin(30 µg), ceftriaxone (30 µg), Ciprofloxacin( 5 µg), Imipenem (10 µg), Azithromycin(15 µg) and Doxycycline (30 µg).

RESULTS AND DISCUSSION
700 samples of all ages and both sexes attending various OPD and admitted in Wards of our Hospital were studied during a period of one year (August 2012-July 2013) out of 700 cases 26(3.71%) were found positive for pulmonary Nocardiosis by microscopy as well as culture examination, whereas 3 cases (0.43%) were positive by microscopy alone and failed to grow on culture were designated as presumptive cases Prevalence of Bronchopulmonary Nocardiosis was reported for the first time from India by Randhawa and co-workers (Singh et al., 2000) Nocardia incidence in pulmonary disease had been reported to range from1.4% to 2.7% and 4% by different workers in different area (Maria et al., 2001; Hamid et al., 2011; Singh et al., 2000). A study from North India had reported 5 cases in 2 year duration period (Shivprakash et al., 2007) whereas from Delhi 3 cases of pulmonary Nocardiosis had been reported (Mathur et al., 2005).

In present study Nocardia species were mainly recovered from sputum 25(96.15) whereas only one species (3.85%) could be isolated from pleural fluid whereas bronchial aspirate and BAL yielded none. Bronchalveolar lavage and lung biopsy can be done if sputum samples are found negative but these samples require technical expertise hence sputum samples are more feasible as has been reported earlier also (Menendiz et al., 1997). Most of the cases 15 (57.69) were above 50 yr age groups and 10 cases (38.46%) were in 26-50 yr age group while only one case was (3.85%) below 25 year age. In a similar study from Sudan 67.3% cases were in age group of 21-49 yr (Hamid et al., 2011). Study from North India also reported more cases in adults only immunosuppressed children were victims (Shivprakash et al., 2007).

In a study from North India male and female ratio had been reported as 75% and 25% respectively (Shivprakash et al., 2007). In suspected Tuberculosis patients of Sudan ratio had been reported as 70% and 30% respectively (Hamid et al., 2011). Male patients (69.23%) outnumbered females (30.77%) in our study, the exact reason for gender difference is not known though hormonal effect may be attributed to virulence or growth of Nocardia species. Regarding occupation of positive cases Farmers and Agriculturist (61.54%) were found to be mainly infected followed by labourers (15.38%) which shows exposure in fertile land hence soil studies are required to be done.

Seasonal variation was observed as the more cases (65.38%) were reported during February to July as compared to August to January(34.62%).

Underlying pulmonary disorders, especially those associated with bronchopulmonary obstruction (viz bronchiectasis, emphysema, asthma, tuberculosis and malignancy may predispose Nocardia colonization of respiratory tract and may lead to invasive infections after long term corticosteroid therapy (Randhwa et al., 1997). We observed common presenting feature was COPD (42.31%) followed by Pulmonary tuberculosis (38.46%), Pneumonia (26.92%), Bronchiectasis (19.23%) and Bronchial asthma (7.69%) respectively (Table 1). We found 8 cases (30.77%) had a past history of use of steroids and 2 cases (7.69%) were diabetic and 2 (7.69%) were HIV positive. A higher incidence with other predisposing factors was observed by Shivprakash et al., (2007) who reported renal transplantation, HIV infection and long term steroid therapy as predisposing factors, Wongthim et al., (1991) also reported higher incidence of pulmonary Nocardiosis in immunocompromised hosts who were on corticosteroids for immune system disorders. Whereas Hamdan et al., (2011) reported COPD as most frequent underlying pulmonary disease followed by Diabetes mellitus in Nocardiosis patients.

Sputum if repeatedly tested negative for AFB in the setting of radiological suspicion of tuberculosis, testing for Nocardia species should be considered in the HIV-infected patients. Despite dysfunction of T-cell mediated immune response in HIV infected patients the Incidence of Nocardia infection is very low in these patients (7.69%) as has been reported by other workers also Subhash et al., (2001).
Common complaints in patients were cough with mucus (88.46%), shortness of breathing (76.92%) followed by chest pain (65.38%), fever (57.69%) and malaise and weight loss. Similar symptoms had been reported earlier also by Wongthem et al., (1991). In our study Nocardia isolates were sensitive to Amikacin and Imipenem (100%), Ceftriaxone (92%) and Cotrimoxazole and Ciprofloxacin (84%).

Table 1: Predisposing factors found in positive cases of pulmonary nocardiosis

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>Predisposing factors</th>
<th>No. of positive cases</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>COPD</td>
<td>11</td>
<td>42.31</td>
</tr>
<tr>
<td>2</td>
<td>Pulmonary tuberculosis</td>
<td>10</td>
<td>38.46</td>
</tr>
<tr>
<td>3</td>
<td>Corticosteroid</td>
<td>08</td>
<td>30.77</td>
</tr>
<tr>
<td>4</td>
<td>Pneumonia</td>
<td>07</td>
<td>26.92</td>
</tr>
<tr>
<td>5</td>
<td>Bronchiectasis</td>
<td>05</td>
<td>19.23</td>
</tr>
<tr>
<td>6</td>
<td>Bronchial asthma</td>
<td>02</td>
<td>7.69</td>
</tr>
<tr>
<td>7</td>
<td>HIV</td>
<td>02</td>
<td>7.69</td>
</tr>
<tr>
<td>8</td>
<td>Diabetes mellitis</td>
<td>02</td>
<td>7.69</td>
</tr>
</tbody>
</table>

Figure 1: Modified Z.N. Staining of Sputum Smear
Azithromycin and Doxycycline (80%). Other workers reported 100% sensitivity to Imipenem and Amikacin but sensitivity to Co trimoxazole was little less (84%) in our isolates as compared to these workers (Shivprakash et al., 2007; Safia et al., 2011) who had reported 100% sensitivity. Regarding sensitivity to Azithromycin and Ciprofloxacin these workers had reported less (64% and 24% as compared to 80% and 84% respectively in our isolate the reason for this difference could be difference of species in isolates of Nocardia.

The study provides data of pulmonary Nocardiosis for first time in patients of Bikaner. The study highlights the importance of Nocardiosis in differential diagnosis of pulmonary disease patients. Unfortunately, none of the isolates were sub-speciated. The observations underscore the point that Nocardiosis warrants greater attention in the differential diagnosis of bronchopulmonary diseases. Prognosis for Nocardiosis patients depends on the rapidity with which the diagnosis is established. Early and correct microbiological diagnosis can help to decrease the disease-related morbidity and mortality. It has been suggested that microscopic morphology can be suggestive enough to warrant empiric therapy for Nocardiosis while awaiting culture results, especially in seriously ill patients and in those with impaired host defense.

REFERENCES
Research Article


