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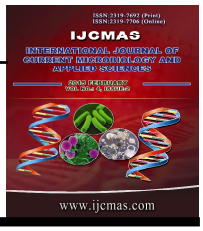


**Original Research Article**

# Aerobic Bacterial Isolates from Atropic Rhinitis and their Antibiogram – A Study from a Teaching Hospital in Andhra pradesh

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**A B S T R A C T**

To know the prevalence of aerobic bacteria associated with atrophic rhinitis and their antibiogram. 100 clinically diagnosed atrophic rhinitis patients were selected for the study. Sterile cotton nasal swabs moistened with sterile normal saline were used to collect the samples from both the nostrils. Material from swabs was subjected for gram's stain and culture on nutrient agar, blood agar & Mac Conkey's medium. Organisms were identified based on standard parameters of colony characters & biochemical tests (Sachidananda *et al.*, 2004). Antibiogram of the isolates were done by Kirby-Bauer disc diffusion method (Dutt and Kameswaram, 2005). Organisms isolated were *Klebsiella pneumoniae* sub species *pneumoniae* 35 (27%), *Klebsiella pneumoniae* sub species *ozaenae* 19(15%), *Pseudomonas aeruginosa* 22(17%), *Staphylococcus aureus* 19(15%), *Proteus vulgaris* 11(9%), *Proteus mirabilis* 10(8%), *Escherichia coli* 6(5%), *Enterobacter cloacae* 5(4%). Antibiotic sensitivity revealed that the most effective drugs were Ciprofloxacin, Amikacin, Gentamicin, Cefotaxime, Erythromicin. 33% showed resistant towards Amoxicillin.

**Keywords**

Atropic rhinitis, *Klebsiella pneumoniae sub species ozaenae*, Third generation cephalosporins

## Introduction

Atropic rhinitis is chronic inflammatory respiratory complication in developing countries with arid climate, such as Middle East, China, India, Egypt, Pakistan, Philippines, Malaysia, Saudi Arabia, Central Africa, Eastern Europe, Greece, Mediterranean area & Latin & South America (Zohar *et al.*, 1990; Lobo *et al.*, 1998), which results in clinical manifestation such as anosmia, mucopurulent and fetid discharge often with foul smell, nasal obstruction with focal areas of squamous metaplasic damage of mucosal glands (Artile *et al.*, 2000). Atrophic rhinitis is the result of infection due to organisms and many workers reported the disease being aggravated due to iron deficiency anaemia (Dutt and Kameswaram, 2005),

associated granulomatous infections such as TB, Leprosy (Siebert and Baton, 1980) etc; some workers even suggested the inheritance factor (Zohar *et al.,* 1990).

Different reports on study of atrophic rhinitis have shown the involvement of different organisms, with varying sensitivity pattern to antibiotics. Such a study is lacking from this area, hence this study was undertaken.

## Materials and Methods

The study was approved by Institutional Ethical Committee. 127 clinically diagnosed atrophic rhinitis patients from MNR Hospital, Sangareddy and Govt. ENT Hospital, Hyderabad, (AP) between April 2008 and April 2010 were considered for the study. Sterile cotton nasal swabs moistened with sterile normal saline were used to collect samples from both nostrils.

Two swabs were taken from each nostril, one was used for gram's staining and the other swab for culture on Nutrient agar, Blood agar and Mac Conkey's medium. Based on colony morphology and various biochemical rests, the aerobic bacteria were identified (Neilson *et al.,* 1995). The study population was from a semi urban area comprising both sexes of all age groups with moderate to low socio-ecomonic status. The study period included all seasons of the year.

Antibiotic sensitivity was done by using disc diffusion method on Muller-Hinton agar (Zohar *et al.,* 1990). Antibiotic disc were procured from Hi-Media Pvt Ltd. Sensitivity pattern was recorded as per supplies norms.

## Result and Discussion

Our study revealed that aerobic bacterial isolates (Table 1) comprised of *K. pneumoniae* sub species *penumoniae* 35(27%), *Klebsiella pneumoniae* sub species *ozaenae* 19(15%), *Pseudomonas aeruginosa* 22(17%), *Staphylococcus aureus* 19(15%), *Proteus vulgaris* 11(9%), *Proteus mirabilis* 10(8%), *Escherichia coli* 6(5%), *Enterobacter cloacae* 5(4%).

Studies by Effat and Madany (2009), Ishwar Singh *et al.* (1994). Raveenthiran (2005), Cervantes Gangora *et al.* (1981) revealed the similar pattern of aerobic bacterial isolates from atrophic rhinitis.

Further this study revealed that females & youth were affected more. This was similar to the findings of Shibley *et al.* (1926), Bunnag *et al.* (1999), Gorbacheva *et al.* (1983), Hen-Sen (1982).

Poor nutrition is considered to be an important factor in the development of Atropic Rhinitis. Iron deficiency and fat soluble deficiency are also believed to be contributing to Atropic Rhinitis

In our study, people from low socio-economic status who comprised of mainly, labourers, farm workers & factory workers were found to suffer more from atrophic rhinitis, which may be due to illiteracy & ignorance.

Significant number of patients was affected during summer because of humid climate. Present study did not find any familial inheritance of the disease.

Antibiotic sensitivity revealed that most effective antibiotics were Ciprofloxacin, Amikacin, Gentamycin, Cefotaxime, Erythromycin. 33% showed resistance to Amoxycillin (Table 2).

Aerobic bacterial profile of atrophic rhinitis presents the same pattern in different race,

sexes, age and season irrespective of geographical region. However the antibiotic sensitivity pattern was observed to be varying. Hence, it is desirable to select the suitable antibiotic after testing the involved organism for its antibiotic sensitivity pattern for proper treatment.

**Table.1** Aerobic bacterial isolates from Atrophic Rhinitis

| S. no | Organism isolated | Number of Isolates |
|---|---|---|
| 1 | *Klebsiella pneumoniae* | 35 (29%) |
| 2 | *Klebsiella pneumoniae ozonae* | 19 (15%) |
| 3 | *Pseudomonas aeruginosa* | 22 (17%) |
| 4 | *Staphylococcus aureus* | 19 (15%) |
| 5 | *Proteus vulgaris* | 11 (9%) |
| 6 | *Proteus mirabilis* | 10 (8%) |
| 7 | *Escherichia coli* | 6 (5%) |
| 8 | *Enterobacter cloacae* | 5 (4%) |

**Table.2** Antibiotic sensitivity pattern of aerobic bacterial isolates

| Name of the organism | | | *K. pneumoniae* | *K. ozoenae* | *P. aeruginosa* | *S. aureus* | *P. vulgaris* | *P. mirabilis* | *E. coli* | *E. cloacae* |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total Number** | | | **35** | **19** | **22** | **19** | **11** | **10** | **6** | **5** |
| **Penicillins** | Amoxycillin | Sen | 19 | 10 | 14 | - | 8 | 8 | 4 | 3 |
| | | Res | 16 | 9 | 8 | - | 3 | 2 | 2 | 2 |
| | Methicillin | Sen | - | - | - | 12 | - | - | - | - |
| | | Res | - | - | - | 7 | - | - | - | - |
| **Aminoglycosides** | Amikacin | Sen | 30 | 16 | 16 | 14 | 11 | 10 | 5 | 5 |
| | | Res | 5 | 3 | 6 | 5 | 0 | 0 | 1 | 0 |
| | Gentamycin | Sen | 29 | 15 | 18 | 19 | 11 | 10 | 6 | 4 |
| | | Res | 6 | 4 | 4 | 0 | 0 | 0 | 0 | 1 |
| **Macrolide** | Erythromycin | Sen | 22 | 13 | 15 | 17 | 9 | 9 | 5 | 5 |
| | | Res | 13 | 6 | 7 | 2 | 2 | 1 | 1 | 0 |
| **Cephalosporins** | Cefotaxime | Sen | 32 | 17 | 22 | 19 | 11 | 10 | 6 | 4 |
| | | Res | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 1 |
| **Quinolones** | Ciprofloxacin | Sen | 31 | 16 | 22 | 19 | 11 | 10 | 6 | 5 |
| | | Res | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |

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