

# Prescribing pattern of antibiotics for post-tuberculous bronchiectasis treated in a tertiary care hospital

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## ABSTRACT

The present study aimed at assessing the prescription pattern of antibiotics used for the treatment of patients diagnosed with post-tuberculous bronchiectasis in a tertiary care hospital. A prospective study was carried out at Government General Hospital located in Kakinada, Andhra Pradesh during April 2011 to June 2011. A total of 120 in-patient prescriptions were analyzed and data was collected on a standard documentation form. Patients who are in the age group of 20 to 80 years were included in the study. The data collected was analyzed for the prescribing patterns of antibiotics based on the demographic profile of patients. The study results showed that among 120 patients, male patients were 92 (76.7 %) and female were 28 (23.3%), indicating higher incidence of the disease in male than female. Out of 120 prescriptions, 108 prescriptions contained double antibiotics, 12 were found with single antibiotic and 6 prescriptions with triple antibiotics. A total of seven different classes of antibiotics were prescribed either alone or in combination. Gentamicin was found in 90 (75.0%) prescriptions, ciprofloxacin in 76 (63.3%) and cefotaxime in 26 (21.7%) prescriptions. It was found that aminoglycosides, cephalosporins and fluoroquinolones were most commonly used in the hospital practice for the treatment as well as management of tuberculosis complications and associated post-TB bronchiectasis.

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## INTRODUCTION

Tuberculosis (TB) is a potentially fatal infectious disease that remains a major threat to public health for centuries around the world. *Mycobacterium tuberculosis* is the causative organism of TB (Poon-chuen, 2008). Today, the incidence of mycobacterial infection (MTB) is alarming worldwide, mainly due to a global increase in developing countries, the increased number of patients with HIV infection and AIDS disease, a growing elderly population, and the emergence of multidrug resistant tuberculosis (De Backer, 2006). MTB infection has been estimated to be accounted for one third of the world's total population. In India, it accounts for one-fifth of the world's new MTB cases, and two-thirds of the cases of the Southeast Asia region (Jyothi, 2009). However, MTB affects the respiratory system mainly with pulmonary tuberculosis (PTB), the most prevalent form of the disease which often results in recurrences and/or medical complications. The problem of TB is further complicated by an upsurge of cases with multidrug resistant (MDR-) and extensively

drug-resistant (XDR-) mycobacterium bacilli in recent years. Directly observed therapy, short-course (DOTS) is the key therapeutic measure for tuberculosis nowadays. It involves the use of a multi-drug regimen with isoniazid (H), rifampicin (R) and pyrazinamide (Z) as essential drugs and a fourth drug, streptomycin (S) or ethambutol (E), was usually added in countries with high prevalence of drug resistance. Treatment for MDR- and XDR-TB involves the use of less potent but more toxic second-line agents together with those aforementioned more potent first line drugs. The second line drugs include the anti-TB fluoroquinolone: ofloxacin, levofloxacin or moxifloxacin, the injectable second line drugs: amikacin, kanamycin or capreomycin, ethionamide or prothionamide, *para*-amino salicylic acid (PAS) and cycloserine (Poon-chuen, 2008). These drugs are used with high success rate in the treatment of tuberculosis cases, particularly PTB. Post-tuberculous bronchiectasis is relatively common in patients who have had recurring tuberculosis. Bronchiectasis is often associated with bronchostenosis, atelectasis; and symptoms of such post-TB complication include hemoptysis, recurring pneumonitis etc. and, at all times, sputum persistently positive for *M. tuberculosis* (Neal, 1962).

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Broad spectrum antibiotics are usually prescribed along with other anti-TB drugs for treating tuberculous bronchiectasis. Prescription drugs are a vital tool used by health care providers to treat both chronic and acute medical conditions. Examining prescription drug use among patients can provide important information on patterns of use among different population groups (Patterns of Prescription Drug Use in the United States, 1988–94, 1994). The study aimed at assessing the prescription pattern of antibiotics for the treatment of TB patients diagnosed with post-tuberculous bronchiectasis in a tertiary care hospital.

The assessment of prescription is an effective basis for the evaluation of prescribing practices of prescribers to achieve rational use of drugs and cost effective medical care for patients.

## METHODOLOGY

The study was performed at Government General Hospital, a tertiary care hospital located in Kakinada, Andhra Pradesh. A prospective study was carried out for a period of 3 months (April 2011 to June 2011) in 120 hospitalized patients by reviewing the inpatients case sheets and prescriptions. Patients diagnosed with post-TB complications treated with antibiotics in the age group of 20 to 80 years were included in the study. The details of patient related information such as age, sex and body weight including medical history were recorded and therapeutic data such as drugs prescribed, doses, dosing frequency, duration and route of administration including laboratory data were obtained by reviewing treatment charts and prescriptions. Data for the present study was collected on a standard documentation form which also contained inpatient number, date of admission, reason

for admission and date of discharge etc. Patients were divided into different groups according to their age and sex. The data collected was analyzed for the prescribing patterns of antibiotics based on demographic profile of patients.

## RESULTS AND DISCUSSION

A total of 120 prescriptions were analyzed for patients diagnosed with clinical manifestations of post-TB bronchiectasis. The study results (Table 1) showed that among 120 patients, male patients were 92 (76.7 %) and female were 28 (23.3%) respectively. It is clearly understood from results that incidence of TB in male patients is highest with age group of 40-49 (32.6) and least in age group of 50-59 (13.1%) and 60-69 (13.1%). No patients were found in the age group of 70-79 and 80 or more for both male and female. It was found that majority of the study population were admitted to the hospital with chief complaints of chest pain, dyspnoea, breathlessness, fever, cough with expectoration etc. along with a medical history of previous pulmonary tuberculosis. The prescribing pattern of antibiotics usage in 120 hospitalized patients diagnosed with post-tuberculous bronchiectasis is depicted in Table 2 & 3. Out of 120 prescriptions, 108 prescriptions contained double antibiotics, 12 were found with single antibiotic and 6 with triple antibiotics. A total of seven different classes of antibiotics were prescribed either alone or in combination. Gentamicin was found in 90 (75.0%) prescriptions, ciprofloxacin in 76 (63.3%) and cefotaxime in 26 (21.7%) either alone or in combination. It was found that aminoglycosides, cephalosporins and fluoroquinolones were most commonly used in the hospital practice for the treatment of tuberculosis and associated post-TB complications.

**Table. 1:** Age wise distribution of patients.

| Age in years | Male |       | Female |       | Total |       |
|--------------|------|-------|--------|-------|-------|-------|
|              | N    | %     | N      | %     | N     | %     |
| 20-29        | 16   | 17.3  | 12     | 42.8  | 28    | 23.3  |
| 30-39        | 22   | 23.9  | 08     | 28.6  | 30    | 25.0  |
| 40-49        | 30   | 32.6  | 02     | 7.2   | 32    | 26.7  |
| 50-59        | 12   | 13.1  | 04     | 14.2  | 16    | 13.3  |
| 60-69        | 12   | 13.1  | 02     | 7.2   | 14    | 11.5  |
| 70-79        | 00   | 0.0   | 00     | 0.0   | 00    | 0.0   |
| Total        | 92   | 100.0 | 28     | 100.0 | 120   | 100.0 |

**Table. 2:** Prescribing pattern of antibiotics.

| Antibiotics/prescription | No. of prescriptions | No of antibiotics | % Distribution of antibiotics |
|--------------------------|----------------------|-------------------|-------------------------------|
| 1                        | 12                   | 12                | 5.1                           |
| 2                        | 102                  | 204               | 87.2                          |
| 3                        | 06                   | 18                | 7.7                           |
| Total                    | 120                  | 234               | 100                           |

**Table. 3:** Comparison of prescribing pattern of different antibiotics used in combination.

| Sl No. | Antibiotic prescribed | Class of antibiotics | No. of prescriptions | Percentage* |
|--------|-----------------------|----------------------|----------------------|-------------|
| 1      | Gentamicin            | Aminoglycoside       | 90                   | 75          |
| 2      | Ciprofloxacin         | Fluoroquinolones     | 76                   | 63.3        |
| 3      | Cefotaxime            | Cephalosporin        | 26                   | 21.7        |
| 4      | Ceftriaxone           | Cephalosporin        | 20                   | 16.7        |
| 5      | Amikacin              | Aminoglycoside       | 16                   | 13.3        |
| 6      | Amoxicillin           | Penicillin           | 08                   | 6.7         |
| 7      | Erythromycin          | Macrolide            | 02                   | 1.7         |

\*Total no. of prescriptions analyzed: 120

## CONCLUSION

This study focuses significant assessment and concomitant monitoring of prescribing practices of prescribers with a view to achieve rational and cost effective medical care avoiding unnecessary use of antibiotics and minimization of prescription errors.

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