Research Article

STUDY OF DRUG USE PATTERN OF ANTI TB DRUGS IN A TERTIARY CARE TEACHING HOSPITAL OF KARNATAKA, INDIA - A RETROSPECTIVE STUDY

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ABSTRACT

Tuberculosis is one of the leading causes of mortality and morbidity around the world, infecting approximately 8 billion people, with an annual death rate of close to 1 million. The retrospective study was undertaken to assess the prescribing pattern of anti-TB drugs. The study was carried out in the general medicine of Navodaya Medical College Hospital and Research Centre at Raichur, over a period of 3 months from September to November 2023. A total of 100 patients were incorporated in the study. Among the total population, 75% were male and 25% were females. The maximum numbers of patients were in the age group of 40 to 60 yrs. The patients were classified into normal TB and EPTB. The study shows that when compared to EPTB, PTB shows most occurrences as per the study conclusions. The often risk factor involved in TB was alcohol (50%) and smoking (50%) followed by tobacco chewing (20%). In this study majority of the patients have received first line antitubercular treatment which consist of isoniazid, rifampicin, pyrazinamide, ethambutol and streptomycin. Out these medications isoniazid, rifampicin, pyrazinamide and ethambutol are the most prescribed medications which contributes 45% of overall drugs prescribed for tuberculosis treatment. In Summary, efforts to enhance the management of tuberculosis in our tertiary care teaching hospital should focus on ensuring guideline adherence and optimizing patient care to achieve the best outcomes for individuals. The patients showed good recovery which concludes that standard prescription pattern provides a good success rate in the treatment of tuberculosis.

Keywords: Tuberculosis, Quality of life, Essential drug list, Drug use indicators, Prescription pattern

INTRODUCTION

Tuberculosis (TB) remains a major global health problem, responsible for ill health among millions of people each year. TB ranks as the second leading cause of death from an infectious disease worldwide, after the human immunodeficiency virus (HIV). The latest estimate reports that there were 9.0 million new TB cases in 2013 and 1.5 million TB deaths (1.1 million among HIV negative people and 0.4 million among HIV-positive people). Tuberculosis is caused by a bacteria called Mycobacterium tuberculosis that most often affects the lungs. Tuberculosis is a curable and preventable disease. It is transmitted from person to person via droplets from the throat and lungs of people with the active tuberculosis disease.[1] Monitoring the outcome of treatment using standardized approach is essential in order to evaluate the effectiveness of the intervention and for comparison. World Health Organization in conjunction with International Union Against Tuberculosis and Lung Disease (IUATLD) provided recommendations on how to evaluate treatment outcomes using standardized categories.[2] Currently, the National Tuberculosis Elimination Program (NTEP) between 2017 to 2025, aims at the elimination of tuberculosis. There are few modifications in the diagnosis, treatment and follow up protocol as well. For drug sensitive TB, daily fixed dose combinations of first line antitubercular drugs are given. All Rifampicin Resistant cases are subjected to baseline kanamycin and levofloxacin drug sensitivity. NTEP also aims at scale up of new drugs like Bedaquiline and Delamanid. It also aims at bidirectional screening of TB and Diabetes Mellitus. Linking of Pradhan Manthri Jan-Dhan yojana, AADHAR and Nikshay for direct cash benefits to the patient's bank under NTEP, the drug Streptomycin will be reserved for special cases like disseminated tuberculosis. INH prophylaxis

guidelines for contacts are being changed to 10mg/kg of INH for children below five years of age.[3] The first line drugs for treatment are isoniazid, rifampicin, pyrazinamide (PZA), ethambutol, rifabutin, and rifapentine while second-line drugs include streptomycin, cycloserine, capreomycin, p-aminosalicylic acid, levofloxacin, moxifloxacin, gatifloxacin, amikacin, and ethionamide.[4,5]

Therefore, it is required to investigate the QoL of TB patients to recognize appropriate actions for improvement of health status and the QoL among the patients.[6] Previous reviews have found quantitative evidence.[7] A patient with tuberculosis faces several physiological, psychological, financial and social problems. These problems have a great impact on the well-being of the patient and impair the quality of life of the patient suffering from tuberculosis. Considering the fact that improvement in HRQoL is an important factor for better response to treatment among TB patients, which may lead to better outcome in patients' health.[8] The World Health Organization (WHO) has reported that more than half of all medicines are prescribed, dispensed, or sold inappropriately.[9]

Prescription pattern monitoring studies are tools for assessing the prescribing, dispensing, and distribution of medicines prevailing in a particular locale. The main aim of such studies is to facilitate rational use of medicines.[10] According to the WHO, core drug use indicators are divided into three categories, namely, the prescribing indicators, patient care indicators, and the quality-of-care indicators. These are highly standardized indicators which do not need national adaptation. Although they do not measure all aspects of drug utilization which require intensive methodologies, extensive and varied sources of data, the core drug use indicators provide a simple tool for quickly and reliably assessing a few critical aspects of pharmaceuticals use in health care. The drug use indicators collected in a cross-section survey or measured at different points in time to assess the change in performance are typically measured within a defined geographic or administrative area, either to describe drug use at a given point in time or to monitor changes over time. This study was designed to assess the drug prescribing practices at the medical outpatient department at our tertiary care center which is a teaching medical college hospital, using the five WHO prescribing indicators which include the average number of drugs per patient encounter, percentage of drugs prescribed by generic name, percentage of encounters with an antibiotic prescribed, percentage of encounters with an injection prescribed, and percentage of drugs prescribed from essential drugs list or formulary.[11]

MATERIALS AND METHODS

This retrospective study was conducted for a period of three months from September 2023 to November 2023 in Navodaya Medical College Hospital & Research Centre (NMCH & RC) Raichur. Permission was obtained from Institutional Ethics Committee of Navodaya Medical College Hospital and Research Centre. The study was approved by the committee by issuing ethical clearance certificate.

Data Collection : Data was collected using data entry form, case sheet.

Inclusion Criteria:

The following criteria were included in this study:

- Patients who were diagnosed with TB and on anti-tubercular drugs.
- Patients of all age group.
- Patients with active or inactive tuberculosis taking anti-tuberculosis treatment.

Exclusion Criteria:

The following criteria were excluded from the study:

- Patients diagnosed with acquired immunodeficiency syndrome.
- Patients with resistance to TB medication.
- Not willing to participate in the study.
- Pregnant and lactating women up to 12 weeks after partum.

The information obtained from case files about study participants were kept confidential and only the collected data was processed.

The collected data were analyzed and monitored for the following variables

- Socio-demographic data
- Prescription pattern in tuberculosis patients

The data from the study were analyzed using descriptive statistics namely total numbers, percentage and mean. Microsoft excel and word were used to generate graphs, tables and results etc.

RESULTS

In the present study, a total number of 100 patients were evaluated during a period of three months. Most of the patients were in the age group of 40–60 and the mean age was found to be 46.56±15.67 years. . Patients having pulmonary TB (PTB) was mainly in the age group of 35-65 years and of extra (PTB) (EPTB) was 51–60 years with mean age 47.25±14.46 years and 54.25±4.77 years, respectively. Out of 100 patients, 75 were males and

25 were females. 96 patients had PTB, out of which 72 (75%) were male and 24 (25%) were female. 4 patients had EPTB, out of which 3 (75%) were male and 1 (25%) were female. The sites of EPTB were studied, and the most common was pleural effusion 4 (100%). The major risk factors involved in TB were, smoking, tobacco chewing, and alcohol consumption were identified in 100 patients. Among 100 patients, total 120 risk factors were identified, in which 50 (50%) were smokers and 20 (20%) were tobacco chewers and 50 (50%) were alcoholic occurred in male patients. Above risk factors were not observed in female patients. The selected patients were most of the times comorbid with sepsis with type II diabetes mellitus, COPD, hypertension and anaemia. All the prescriptions evaluated in the study adhered to the guidelines. It is known that anti TB drugs are more likely to have drug interaction, among 100 patients 57 drug-drug interactions were found, in which 10 (17.55%) were major, 15 (26.31%) were moderate and 22 (38.59%) were minor. Rifampicin, isoniazid and pyrazinamide accounted for the majority of drug interactions involving TB patients. Figure 1 illustrates the percentage of each drug type prescribed. In total, the patients were prescribed 560 doses of drugs during the course of their treatment. The average number of drugs prescribed per encounter during the initiation of therapy was 5.3±1.72.

Table 1: Age wise distribution of subjects

Age group	No of patients	Percentage
30- 40	20	20%
40-50	45	45%
50-60	35	35%

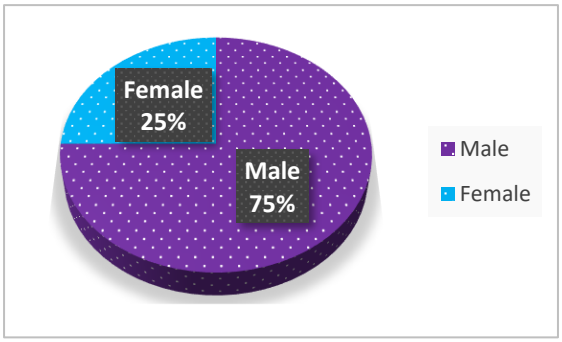

Figure 1: Gender wise distribution of study subjects

Table 2: Patient Characteristics

No	Patient Characteristics		Mean ± SD (n=100)
1	Age (Years)		46.56 ± 15.67
2	Gender (N)	Male	75
		Female	25
3	Site of disease (N)	PTB	96
		EPTB	4

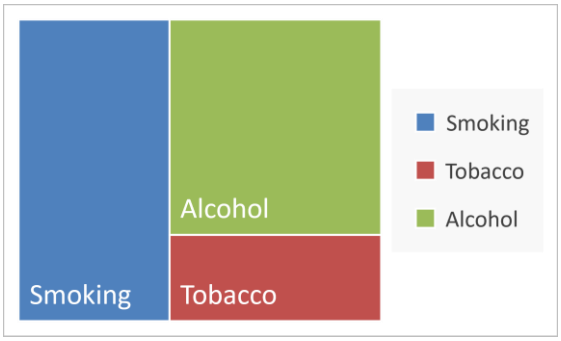

Figure 2: Risk factors involved in tuberculosis

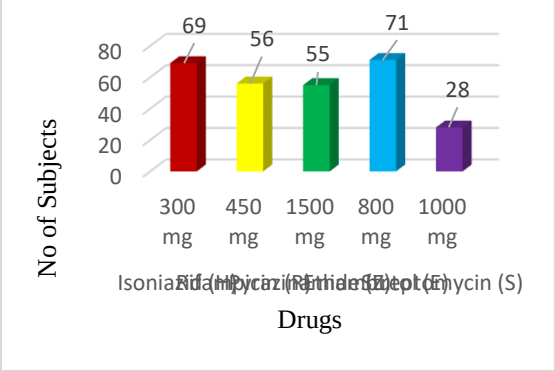

Figure: 3 Antitubercular Regimen

Table: 4 Other drugs prescribed in tubercular subjects

Drugs	No of Subjects
Antibiotics	92
Antipyretics& Analgesics	70
Bronchodilators	14
Vitamins&Minerals	70
Others	35

DISCUSSION

The study titled "Study of Drug use pattern of Anti TB Drugs in a Tertiary care Teaching Hospital of Karnataka, India- a retrospective study" was carried out in the general medicine of Navodaya Medical College Hospital and Research Centre at Raichur, over a period of 3 months from September to November 2023. A total of 100 patients were incorporated in the study. Among the total population, 75 (75%) were male and 25 (25%) were females [Fig 1]. It is found that males were more prone to tuberculosis when compared to females with a ratio of 3:1. A study conducted by Mathew T F et al., reveals that the pervasiveness of tuberculosis is more in males than females with a ratio of 8:2. Also the NTP summarized as the ratio of the occurrence of TB between the male and female were 5:2. Not only these studies some other studies also point out that the TB is more prone to male gender. The mean age of the study population was found to be 46.56±15.67 [Table 2]. According to a descriptive study conducted by Habib-ullah K et al., 42.10±20.38 years is the mean age group for TB occurrence. Age group analysis of entire population in our study shows that the most prominent group was 40-60 comprising of 80 (80%) patients followed by 30-40 which comprises about 20(20%) patients. Overall, the study shows that the most prominent age group for the occurrence of TB was 40-60, as which is proved by the preceding studies. Although middle aged adults have a good immune system, the TB rate is very high in this age group only, because of bad habits such as smoking, chewing tobacco, alcoholism, etc. Out of the study population, 50(50%) patients were alcoholic as well as smokers. Only 20% of the patients were addicted to tobacco [Fig 2]. The study shows that when compared to EPTB, PTB shows most occurrences as per the study conclusions. In this study, a large number of drug-drug interactions were found among which, the most notable were those between rifampicin and pyrazinamide, rifampicin and isoniazid, and ciprofloxacin and theophylline. In this study majority of the patients have received first line antitubercular treatment which consist of isoniazid, rifampicin, pyrazinamide, ethambutol and streptomycin. Out these medications isoniazid, rifampicin, pyrazinamide and ethambutol are the most prescribed medications which contributes 45% of overall drugs prescribed for tuberculosis treatment.

CONCLUSION

The present study aimed to assess the prescription pattern of TB patients since it can be completely cured and eradicated by proper management and monitoring and it revealed that favourable outcome could be achieved with regular use of medicine at right dose and frequency. The proper diagnosis and rational prescribing of anti-TB drug regimen is a basic necessary for a positive therapeutic outcome in TB patients. In the present study selection of drug regimen played important role in obtaining improved patient care. The study suggests that following the standard prescription patterns and guidelines provided complete success rate in the treatment of tuberculosis. In conclusion, our retrospective study on the prescription pattern of antitubercular drugs in a tertiary care teaching hospital has provided valuable insights into the management of tuberculosis within our healthcare setting.

RECOMMENDATION

The findings from this study highlight several important aspects:

1. It is observed that the majority of patients received standard and recommended regimens for tuberculosis treatment. This suggests that healthcare providers in our hospital adhere to established guidelines for prescribing antitubercular drugs.
2. Multidrug-Resistant TB (MDR-TB) Concerns: The study also revealed a concerning small proportion of patients who were prescribed second line antitubercular drugs, indicating the presence of multidrug-resistant tuberculosis in our population. This underscores the need for continued surveillance and efforts to prevent the development and spread of drug resistance.
3. Adherence to Duration: It is encouraging to note that most patients received appropriate treatment duration, which is crucial for achieving successful outcomes and preventing relapse. This suggests a commitment to patient care within the healthcare facility.
4. Monitoring and Side Effects: The study raised awareness about the importance of monitoring patients for adverse effects of antitubercular drugs. Adequate monitoring and management of side effects are crucial to ensure patient compliance and reduce treatment interruptions.
5. Opportunities for Improvement: Our findings suggest that there may be opportunities to further optimize prescription practices, especially with regard to reducing the use of second-line drugs and improving adherence to guidelines. This could lead to better patient outcomes and decreased healthcare costs.

In summary, this retrospective study provides valuable information for healthcare providers, administrators, and policymakers. It highlights the strengths of our current prescription practices and identifies areas where improvements can be made. Moving forward, efforts to enhance the management of tuberculosis in our tertiary care teaching hospital should focus on ensuring guideline adherence, reducing drug resistance, and optimizing patient

care to achieve the best possible outcomes for individuals affected by this disease.

CONFLICT OF INTEREST

The authors have no conflicts of interest.

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