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A PROSPECTIVE OBSERVATIONAL STUDY ON TUBERCULOSIS AND ITS PHARMACOLOGICAL MANAGEMENT IN A TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

Tuberculosis is a contagious infection primarily affecting the lungs but can spread to other organs. This study aims to analyze the pharmacological management of tuberculosis patients in a tertiary care teaching hospital. A total of 120 cases were analyzed, with the majority being male patients aged 41-50 years. The most common etiological factor was smoking and alcohol consumption. The diagnosis was primarily confirmed using sputum culture and X-rays. Patients were treated with first-line drugs such as isoniazid, rifampicin, pyrazinamide, and ethambutol, along with second-line therapy where necessary. The study concludes that early diagnosis and adherence to treatment significantly improve patient outcomes.

KEYWORDS: Tuberculosis, Sputum culture, Isoniazid, Rifampicin, Pharmacological management.

INTRODUCTION

Tuberculosis (TB) remains a significant global health concern, ranking among the top infectious diseases responsible for morbidity and mortality worldwide.[1] It is caused by Mycobacterium tuberculosis, an aerobic, acid-fast bacillus that primarily affects the lungs but can also infect other organs such as the brain, spine, and kidneys.[2,3] TB is transmitted through airborne droplets when an infected person coughs, sneezes, or speaks, making it a highly contagious disease.[4]

According to the World Health Organization (WHO), an estimated 10.6 million people developed TB in 2021, with 1.6 million deaths globally.[5,6] Despite advancements in diagnostic tools and pharmacological therapies, TB continues to pose challenges due to emerging drug-resistant strains, delayed diagnosis, and socio-economic factors that hinder treatment adherence.[7] The pharmacological management of TB includes a combination of first-line and second-line

anti-tubercular drugs.[8] The standard regimen comprises isoniazid, rifampicin, pyrazinamide, and ethambutol, known as HRZE therapy.[8,9] However, the emergence of multidrug-resistant TB (MDR-TB) and extensively drug-resistant TB (XDR-TB) necessitates the use of alternative therapies such as levofloxacin, amikacin, and cycloserine.[10] Non-compliance with treatment regimens and inadequate healthcare infrastructure further exacerbate the burden of TB.[12,13]

The present study aims to evaluate the demographic distribution, etiology, diagnostic approaches, and pharmacological management of TB patients in a tertiary care teaching hospital. By analyzing patient records and treatment outcomes, this study seeks to provide insights into the effectiveness of current TB management strategies and highlight areas for improvement.

MATERIALS AND METHODS

This prospective observational study was conducted at a tertiary care teaching hospital over a period of six months. Patient data, including demographics, clinical history, laboratory findings, and treatment regimens, were collected from hospital records.

Inclusion Criteria

- Patients diagnosed with pulmonary or extra pulmonary tuberculosis.
- Patients who have undergone confirmatory diagnostic tests such as sputum culture, chest X-ray, or laboratory investigations.
- Patients receiving standard anti-tuberculosis pharmacological treatment.

Exclusion Criteria

- Patients with incomplete medical records.
- Patients receiving non-standard or alternative treatments for tuberculosis.
- Patients with co-existing conditions that could interfere with tuberculosis treatment, such as severe immunosuppression unrelated to tuberculosis.
- Pediatric patients under the age of 12.

The pharmacological treatment of TB patients was categorized into first-line and second-line therapy based on disease severity and drug resistance patterns. Statistical analysis was performed to assess treatment efficacy and patient adherence to prescribed regimens.

RESULTS

Table 1: Age wise distribution.

S. No.	Age Group	Male	Female	Percentage
1.	11to20	6	1	5.83%
2.	21to30	14	10	20%
3.	31to40	14	5	15.83%
4.	41to50	21	13	28.33%
5.	51to60	10	15	20.83%
6.	61to70	9	2	9.16%
	TOTAL	**74**	**46**	**100%**

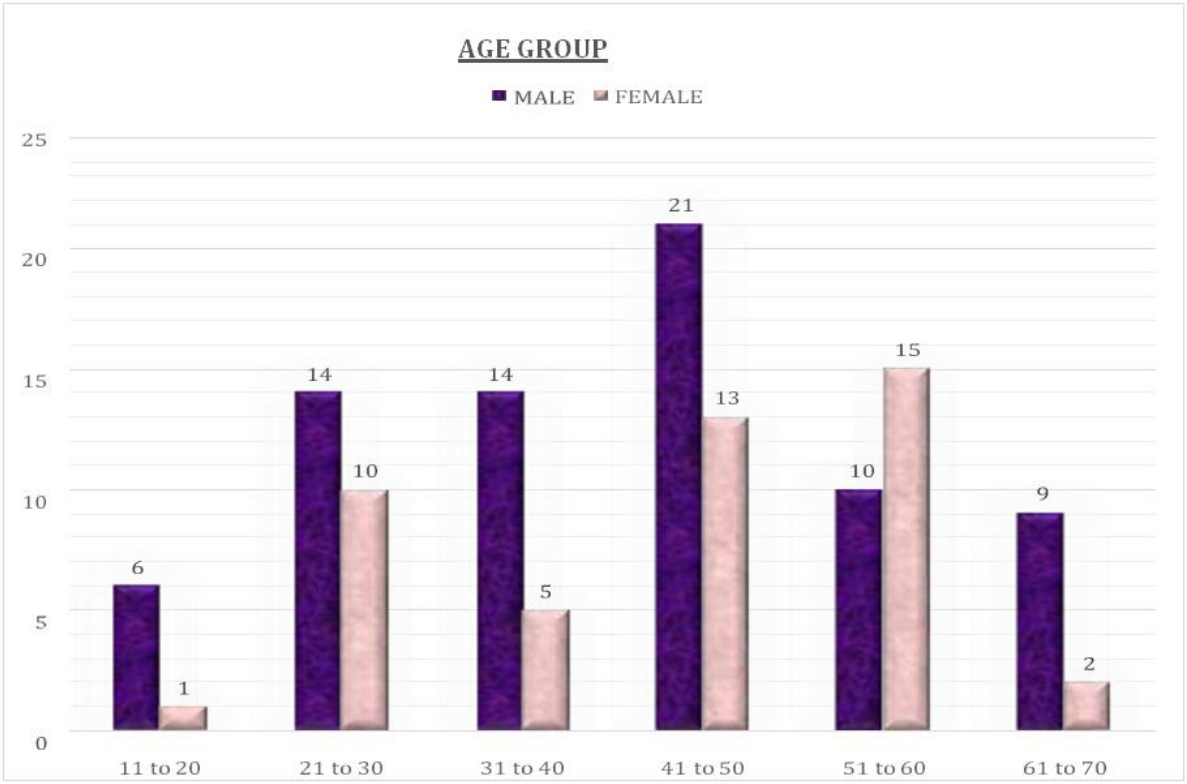

Table 2: Social habbits wise distribution.

S. No	Social habits	Male	Female
1.	Alcohol	30	0
2.	Smoking	41	0

Table 3: Appetite Wise Distribution.

S. No	Appetite	Male	Female
1.	Normal	14	6
2.	Abnormal	60	40

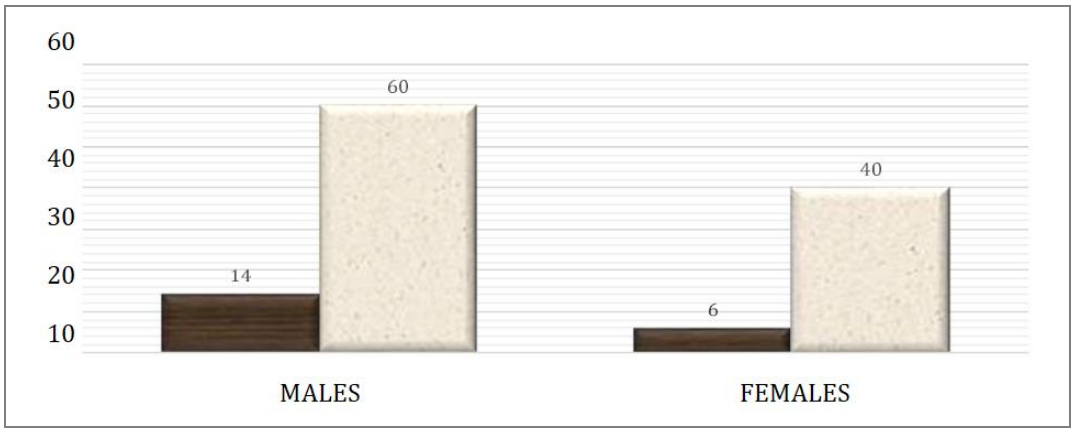

Table 4: Laboratory investigations wise distribution.

S. No.	Lab Investigations	Male	Female
1.	Hb	74	46
2	WBC	74	45
3.	ESR	74	46
4.	RBS	69	44
5.	SGOT	49	26
6.	SGPT	49	26
7.	Sr.CREATININE	63	39
8.	BUN	20	13
9.	Sr.ELECTROLYTES	4	0
10.	URINEANALYSIS	10	9

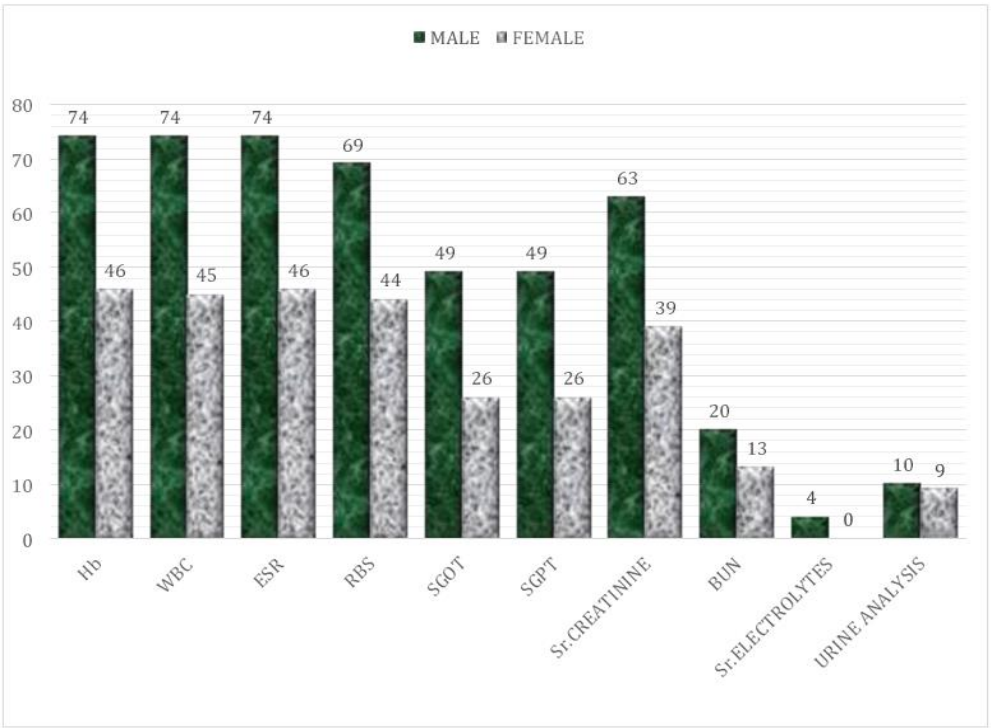

Table 5: Diagnosis wise distribution.

S. No	Diagnostic tools	Male	Female
1.	X- RAY	38	27
2.	HRCT-CHEST	32	17
3.	SPUTUMCULTURE	71	45
4.	MOUNTAXTEST	11	11

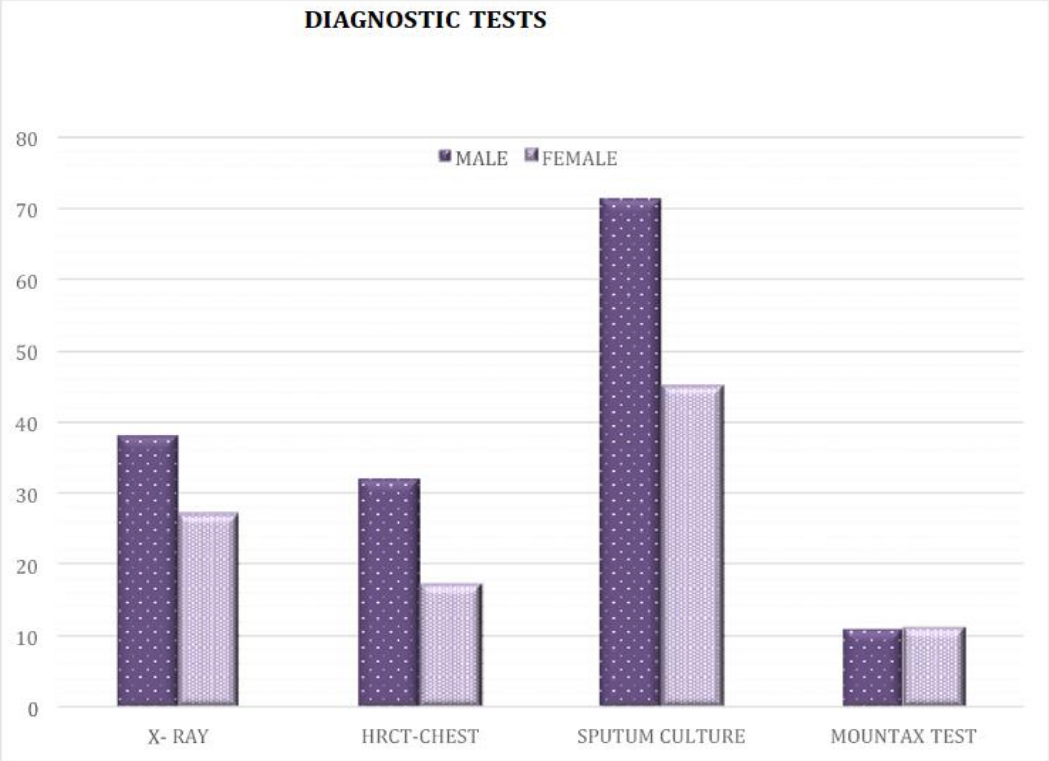

Table 6: First Line Drugs.

S. No	First line drugs	Male	Female
1.	ISONIAZIDE	73	46
2.	RIFAMPACIN	72	45
3.	PYRAZINAMIDE	45	34
4.	ETHAMBUTOL	70	46
5.	AMIKACIN	52	25

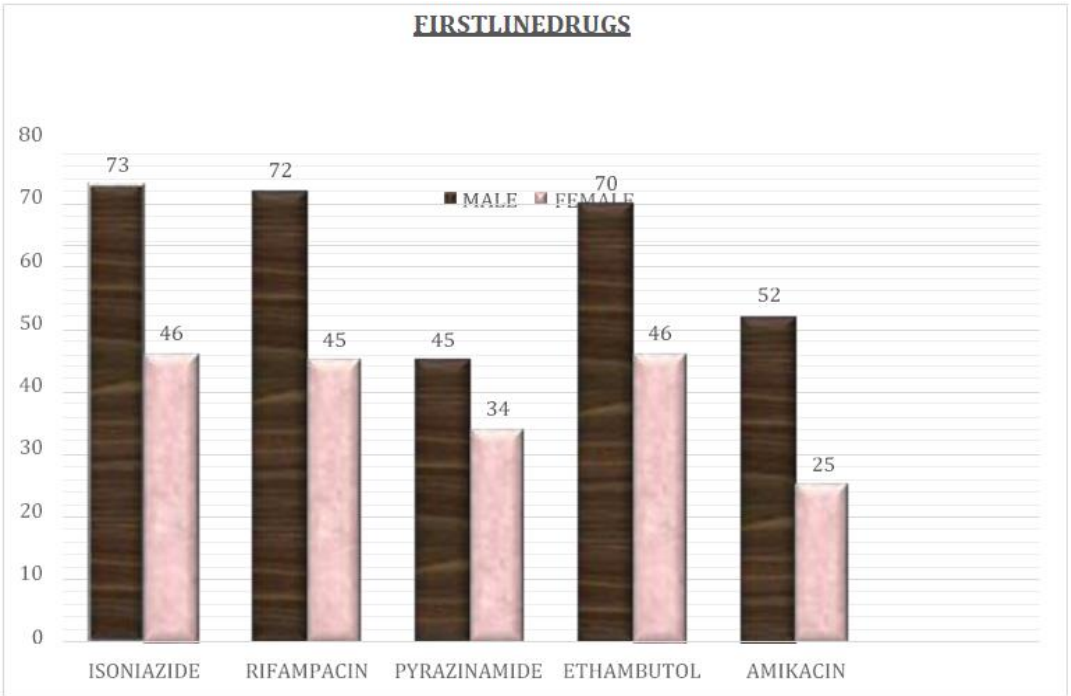

Table 7: Second line drugs.

S. No.	Second line Drugs	Male	Female
1.	AMIKACIN	52	25
2.	LEVOFLOXACIN	22	13
3.	AMOXICILLIN	16	11
4.	BEDAQUILLINE	1	0

A total of 120 TB cases were analyzed in this study, of which 74 (61.66%) were male and 46 (38.33%) were female. The highest incidence of TB was observed in the 41-50 age groups (28.33%). The primary risk factors identified were smoking and alcohol consumption, which accounted for 59.16% of cases.

Diagnostic tools used:

- Sputum culture: 116 cases (96.66%)
- Chest X-ray: 65 cases (54.16%)
- Additional laboratory investigations: 40 cases (33.33%)

Pharmacological treatment breakdown:

- First-line therapy:
- Isoniazid: 99.16% of cases
- Rifampicin: 97.50%
- Pyrazinamide: 65.83%
- Ethambutol: 88.7%
- Second-line therapy:
- Amikacin: 64.16%
- Levofloxacin: 29.16%
- Amoxicillin: 22.50%
- Supportive medications:
- Pantoprazole: 89.16%
- Paracetamol: 35.83%

DISCUSSION

The study findings indicate that tuberculosis predominantly affects middle-aged individuals, with a higher prevalence among males. Smoking and alcohol consumption were identified as significant risk factors, emphasizing the need for lifestyle modifications alongside pharmacological treatment. The diagnostic approach relied heavily on sputum culture and chest X-rays, aligning with global TB diagnostic guidelines. The pharmacological management adhered to standard first-line therapy, with second-line drugs being used in cases of drug resistance or treatment failure.

Despite the availability of effective medications, challenges such as drug resistance, treatment adherence, and socio-economic barriers hinder TB control efforts. Strengthening patient education, improving healthcare infrastructure, and ensuring adherence to treatment protocols are essential for achieving better outcomes.

CONCLUSION

This study highlights the critical role of early diagnosis and effective pharmacological intervention in TB management. Addressing lifestyle risk factors and ensuring adherence to treatment regimens are essential in reducing disease burden.

Further research and public health initiatives are necessary to improve TB control strategies and combat emerging drug-resistant strains.

CONFLICT OF INTREST

The authors declare no conflicts of interest.

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