

Evaluation of Patients with Pulmonary Tuberculosis Attending at DOTS Center of Chattagram Maa Shishu-O-General Hospital

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Abstract

Background: Pulmonary Tuberculosis (TB) is a contagious bacterial infection that mainly involves the lungs, but may spread to other organs caused by *Mycobacterium tuberculosis*. To evaluate the age and gender characteristics of pulmonary tuberculosis patients as well as outcome of tuberculosis control.

Materials and methods: A retrospective study was conducted at DOTS center at a tertiary, teaching hospital in the Chattogram region of Bangladesh. by evaluating the medical records of 133 patients with pulmonary tuberculosis. Age, gender, sputum smear status and Gene-Xpert test results were among the variables examined. Patients with comorbid conditions were not considered. Other information was not evaluated.

Results: The male-to-female ratio in patients with pulmonary tuberculosis was 1.4:1. A large proportion of patients (44%) were in the young and reproductive age group. Approximately, one-fifth of patients were in the pediatric age group and one-sixth of patients were in the geriatric age group.

Conclusion: The finding suggests that two-thirds of all female smear-positive patients were of reproductive age has significant implications for tuberculosis control strategies due to increased chances of mother-to-newborn transmission. Because of the increased risk of default, difficulties, inconvenience, and the presence of other concomitant diseases, pediatric and geriatric patients are a large category.

Key words: *Mycobacterium tuberculosis*; Pulmonary tuberculosis; Sputum; Smear.

INTRODUCTION

Tuberculosis is a leading cause of death worldwide. In the early 1990s, the government of Bangladesh brought up a program in collaboration with WHO to control TB at a national scale called DOTS (Directly Observed Treatment Short Course).¹ The DOTS program was initiated in Chattogram Maa Shishu O General Hospital in 2006 to follow up and cure TB-diagnosed patients, where more than five thousand patients have been treated to date. The expansion of the DOTS program has proven its efficacy in reducing morbidity and mortality in Bangladesh.

Male tuberculosis cases outnumber female infections in almost every country.² In most low-income countries, the ratio of male to female cases of tuberculosis is approximately 2:1, attributable to biological characteristics and socioeconomic and cultural barriers to access healthcare.^{3,4} In addition, the World Health Organization has suggested further tuberculosis research on patient age and gender to establish whether women with tuberculosis are more likely to be diagnosed, treated, or reported.⁵ Various investigations have revealed various statistical data about gender in the clinic-radiological profile of tuberculosis patients.⁶ This study is aimed to evaluate the profile of pulmonary tuberculosis patients attending the DOTS center of Chattagram Maa Shishu-O-General Hospital (CMOSGH) considering age, gender, and role of sputum smear and GeneXpert test in patients with tuberculosis.

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MATERIALS AND METHODS

This was a retrospective study. Patients of pulmonary tuberculosis diagnosed and treated at the DOTS center from January 2022 to December 2022 in CMOSGH were included in the study. A retrospective analysis of the records of such patients was undertaken. Data regarding age, gender, sputum smear status and Gene-Xpert test results were studied. No other details were considered.

RESULTS

Records of 133 patients formed the study group. Out of these, 76 (57.10%) were males and 57 (42.90%) were females (Fig-1).

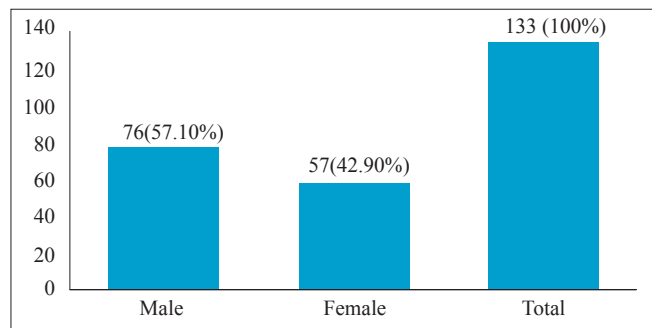


Figure 1 Total patient

Age-wise distribution of patients is shown in Figure 2. The highest number of patients are found in the young and reproductive age group, 59 (44.4%), while the lowest is the age group 80-99 having a percentage of 3.

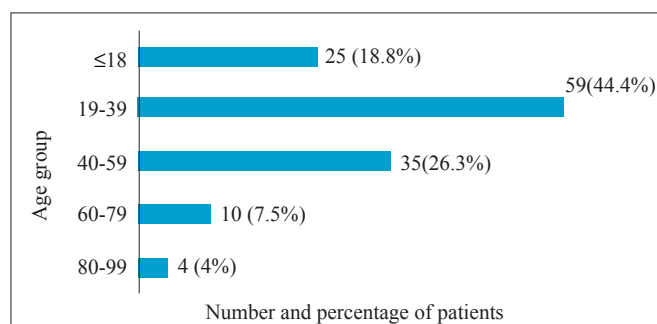


Figure 2 Distribution of different age groups

The breakup of smear-positive and smear-negative patients was 45 (34%) and 88 (66%), respectively and in the case of Gene-Xpert results 49 (37%) were positive and 84 (63%) were negative (Fig-3).

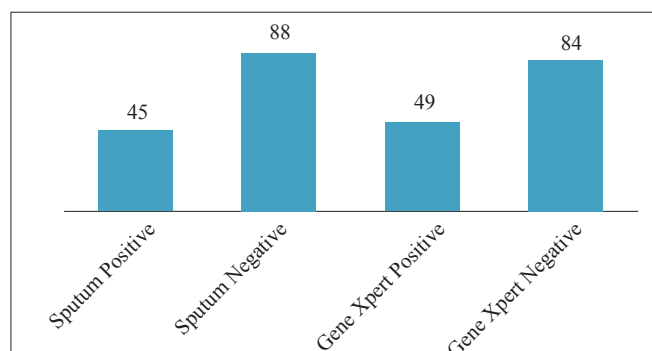


Figure 3 Comparison of different test for diagnosis of pulmonary tuberculosis

Among the smear positives, 26 (58%) were males and 19 (42%) were females. The corresponding numbers among smear negatives were 54 (61%) and 34 (39%), respectively (Fig 4, Table I).

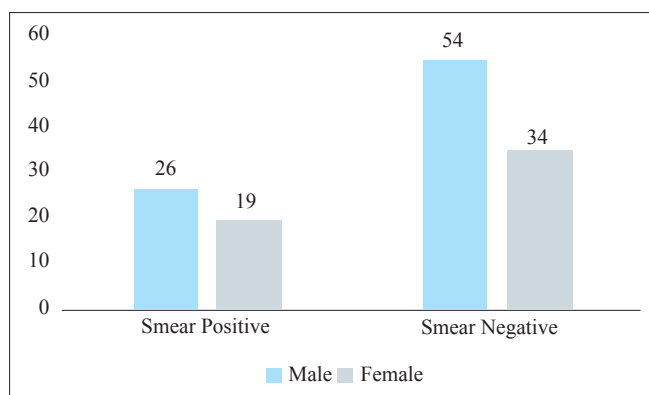


Figure 4: Gender distribution in sputum smear status

Table I Association between age group and sputum culture

Age	Sputum Positive	Sputum Negative	Chi-Square Value	p Value
≤18 Years	7	18		
19-39 Years	17	42		
40-59 Years	16	19	3.78 (App.)	0.436
60-79 Years	3	7		
80-99 Years	2	2		
Total	45	88		

The young and reproductive age group constituted a significant percentage, 35 (59%) for males and 24 (41%) for females (Table II). Approximately, 14 (10%) of patients belonged to the geriatric age group (60-99 years) and 25 (19%) belonged to the pediatric age group (≤18).

Table II Association between age group and gender

Age	Male	female	Chi-Square Value	p Value
≤18 Years	6	19		
19-39 Years	35	24		
40-59 Years	25	10	15.44(app.)	0.004
60-79 Years	7	3		
80-99 Years	3	1		
Total	76	57		

Regarding the Gene-Xpert test result, in the pediatric age group, 11 (44%) were positive and 14 (56%) were negative (Table III).

Table III Association between age Group and gene Xpert

Age	Gene Xpert Positive	Gene Xpert Negative	Chi-Square Value	p Value
≤18 Years	11	14		
19-39 Years	22	37		
40-59 Years	13	22	2.01 (App.)	0.733
60-79 Years	2	8		
80-99 Years	1	3		
Total	49	84		

DISCUSSION

The results of this study show that the male-to-female ratio in patients of pulmonary tuberculosis is 1.4:1, which is in concurrence with other reports.^{3,4} However, the ratio of sputum positive to sputum negative is 1:2, which, while significant, contradicts several other publications that say that in tuberculosis control efforts, such a ratio should be 1:1. Because of the limited sample size and retrospective nature of the study, it is impossible to say whether this reflects increased prevalence, under-treatment of smear-negative patients, or improved sputum collection and analysis. Another notable finding is that the male-to-female ratio among sputum-positive cases remained at 1.4:1, indicating that women are equally motivated to generate adequate quality sputum and be diagnosed as sputum positive. The age distribution of patients revealed some intriguing findings. Almost 44% of patients were found to be in the young and reproductive age range, with a higher proportion of sputum positives and females, implying that more sputum-positive females were diagnosed in this group. This has serious consequences for tuberculosis control measures. Females in the reproductive age group are (a) at a higher risk of transmitting the infection to the newborn, at times attributed to nursing (b) at a higher risk of complications because of attendant antenatal and postnatal morbidity, especially in developing countries and (c) at a higher risk of default, due to various reasons like work at home, childcare, inconvenience to visit DOTS center, etc.⁷ The same was discovered among males. The probability of default is greater in developing nations and countries with high incidence due to a variety of socioeconomic factors such as males being sole breadwinners, higher possibilities of employment in unorganized industries, and lower chances of disease knowledge. Anecdotal evidence suggests that males of reproductive age have found it inconvenient to attend DOTS centers due to job schedules. All these factors should be studied and suitable actions should be devised. Finally, nearly one-sixth

of patients (Both sexes) were in the geriatric age group. This group typically has coexisting systemic disorders, making patients vulnerable to disease complications, disease transmission, and difficulties in treatment due to the side effects involved. Furthermore, the inconvenience of visiting DOTS centers due to illness and the requirement of an accompanying attendant may result in treatment discontinuation and increased chances of drug resistance. Approximately one-fifth of the patients were of pediatric age. This group is at a higher risk of drug distribution and treatment difficulty due to the inconvenience of visiting the DOTS center and the insufficient drug dosage.

LIMITATION

The limited sample size and retrospective nature of the study.

CONCLUSION

In conclusion, the results of this study show that in patients of pulmonary tuberculosis i) Male to female ratio was 1.4:1 ii) The smear-positive to smear-negative ratio was 1:2 iii) Large numbers of patients were in the young and reproductive age group iv) Approximately one-sixth of patients belonged to the geriatric age group and one fifth were in pediatric age group. These findings become highly relevant and very significant in planning different strategies for tuberculosis control programs, especially in countries with high prevalence and poor resources.

DISCLOSURE

All the authors declared no competing interest.

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