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Assessment of the Prevalence of Tuberculosis among the High Risk Populations of Bera, Pabna

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ABSTRACT

The study was conducted to evaluate the prevalence of tuberculosis among the populations of Bera, Pabna from January to December 2021. Samples (Sputum) were collected from 09 different unions of susceptible pulmonary TB patients of different ages and occupations by field health workers in Bera, Pabna using a pretest and questionnaire. A gross of 4353 samples (January-December 2021) was tested by fluorescent smear microscope and GeneXpert, in the middle of them, 2442 (56%) were male, and rests of 1911 (44%) were female. We stained 2577 samples and 151 participants tested positive. By GeneXpert method, we tested 1776 samples and 266 tested positive. We identify total of 417 sputum positive, of these 253 (61%) were male and 164 (39%) were female. We found a total of 542 positive TB patients from January to December 2021, in the middle of them, Bacteriologically confirm 405 (75%), Clinically diagnosed 25 (5%), Extrapulmonary 78 (14%), Retreatment 32 (6%) and Failure 2 (0%). Maximum positive TB patients age was >65 years. Comparisons between 2020 and 2021, positive TB patients in 2020 were 408 and in 2021 were 542. Microscopy and Xpert test together to make it possible for large amounts of presumptive tests and diagnosed easily to determine the prevalence of tuberculosis. The overall prevalence of pulmonary tuberculosis among the participants was 9.6%.

Keywords: Prevalence, Tuberculosis, High risk populations, Assessment, Pabna, and GeneXpert.

INTRODUCTION:

Tuberculosis (TB) is an airborne infectious disease caused predominantly by *Mycobacterium tuberculosis* species of pathogenic bacteria. Tuberculosis typically attacks the lungs but can also affect other parts of the body (WHO, 2020). This is an airborne disease and persons become infected with TB when they inhale droplet nuclei that contain tubercle bacilli and the bacilli begin to multiply in the lungs. It can also spread to other parts of the body via the blood stream, the lymphatic system or through direct extension to other organs. The highest priority for TB control is identification and successful treatment of patients who are suffering from smear-positive pul-

monary TB. Pulmonary TB should be presumed in a person who presents with persistent cough for two weeks or more, with or without production of sputum and despite the administration of a broad spectrum antibiotic (without anti TB action) (WHO, 2020; Saikat *et al.*, 2020).

Signs and symptoms of active TB may also vary based on the organ that is pretentious. Most of the times, the lungs of the patients are affected. Symptoms of TB of the lungs includes cough for three or more weeks, blood in cough, chest pain, shortness of breath, coughing up of blood, loss of weight, loss of appetite, fever, night sweats (WHO, 2020). TB can also affect organs apart from the lungs. Extrapulmo-

nary tuberculosis (EPTB) is any bacteriologically confirmed or clinically diagnosed case of TB involving organs other than the lungs such as pleura, lymph nodes (mediastinal, hilar, cervical etc.), larynx, meninges, abdomen, genitourinary tract, spine, bones and joints, skin etc. Globally, children less than 15 years old comprise 10% of all TB cases. However, the source of TB infection in a young child is usually an adult, generally a family member living in the same household, with bacteriologically positive PTB. Common EPTB in children- Tubercular lymphadenopathy, TB pleural/pericardial effusion, Tubercular meningitis, Spinal TB (Pott’s disease), Abdominal TB, Tubercular arthritis (Nahid et al., 2019; WHO, 2020).

The most commonly used diagnostic tools for tuberculosis is – Sputum smear examination, Radiological (X-ray) examination of the lungs, Tuberculin skin test (Mantoux Test), Culture of TB bacilli, Rapid Molecular Diagnostic tests (GeneXpert, LPA), FNAC, Biopsy and Histopathology for EP TB. NTRL & RTRLs are performing liquid culture (MGIT) and Line Probe Assay (LPA) of 2nd line drugs for confirmed RR TB cases to ensure early diagnosis of PreXDR and XDR TB patients (WHO, 2020). All bacteriological examinations including smear microscopy, Culture-DST, GeneXpert and LPA are provided free of cost. Treatment of tuberculosis should be started immediately after confirmation of TB diagnosis. Treatment regimens define the specific drug combinations used and the intended length of treatment. Anti-Tuberculous drugs are the most important component of tuberculosis treatment. All patients with a strain susceptible to first-line drugs should receive the same standard treatment regimen for 6 months, (may be extended up to 12 months, depending on the site of involvement). FDC tablets are composed as - 4 FDC (isoniazid 75 mg + rifampicin 150 mg + pyrazinamide 400 mg + ethambutol 275 mg); 2 FDC: (isoniazid 75 mg + rifampicin 150 mg) (UNGA, 2020; WHO, 2015; NCI, 2010)

A 31 year aged Bangladeshi male was diagnosed by GeneXpert with RR TB, Upazilla Health Complex, Bera, Pabna in November 2021 with the symptoms

of coughing for more than 2 weeks, fever, weight loss, chest pain. The patient has been treated with Longer MDR TB regimen (LTR) for 18 months (NTP, 2020, NGMTB, 2016). Tuberculosis (TB) continues to be a global public health problem, particularly in the developing countries (CDC, nd). Nearly one-third of the global population (i.e., two billion people) is infected with *Mycobacterium tuberculosis* (MTB) and is at risk of developing the disease. According to the Global TB Report 2020, TB causes ill health among millions of people each year (NGOMTC, nd; WHO, 2015; WHO, 2007). With an estimated population of 164 million, Bangladesh is listed among the 30-high burden countries for TB and 27 for MDR-TB. According to the Global TB Report 2020, 292,942 TB patients were notified to the National Tuberculosis Control Programme (NTP) in 2019 (CDC, nd; NGOMTB, 2021). Vision of the National TB Control Programme TB Free Bangladesh: Zero deaths, disease and suffering due to TB (NGMTB, 2021).

MATERIALS AND METHODS:

Study Design and Place: The study was designed as prevalence of Tuberculosis and areas were selected purposively for collecting the sample. The area was purposively selected in Bera, Pabna, Rajshahi.

Study Period and Population: The study was conducted for a period from January-December 2021, when literature review, questionnaire preparation, data collection and works related to the dissertation was complete. Samples were collected from 09 different unions of Bera upazilla.

Sample Size and Sampling Technique: The sample size was 4353 and sputum sample.

RESULTS:

Findings of the study: To detection the prevalence of tuberculosis in Bera, total 4353 samples were collected according to their symptoms. The analyzed data have been presented in this chapter through tables and appropriate graphs. The results of the study have been described as follows:

Table 1: Total eligible participants for sputum presumptive tests.

Total Presumptive test	Test Method	Male	Female
4353	GeneXpert	996	780
	LED Microscopy	1446	1131

Table 1 shows there were 4353 eligible participants for Sputum tests, of these by GeneXpert method 996 (56%) were male and 780 (44%) were female. By LED Microscopy method 1446 (56%) were male and 1131 (44%) were female. Total 2442 (56%) were male and 1911 (44%) were female.

Table 2 shows we identify total 417 sputum positive, of these by GeneXpert 168 (63%) were male and 98 (37%) were female. By Microscopy 85 (56%) were male and 66 (44%) were female. Total 417 sputum positive, 253(61%) were male and 164 (39%) were female.

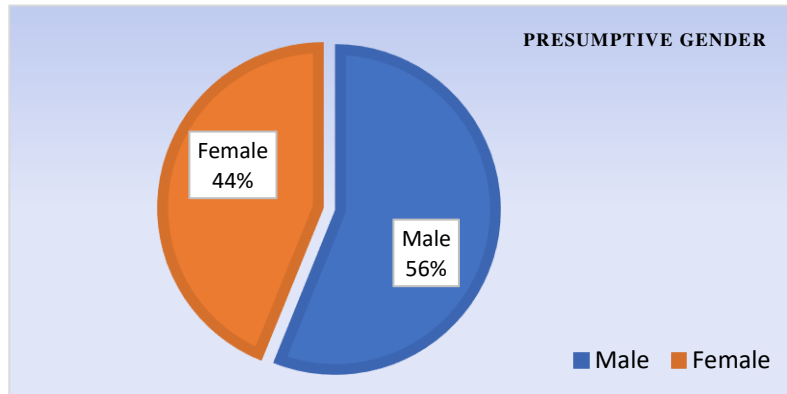


Fig. 1: Total eligible participants for sputum tests.

Table 2: Total sputum positive.

Total Sputum positive	Test Method	Male	Female
417	GeneXpert	168	98
	LED Microscopy	85	66

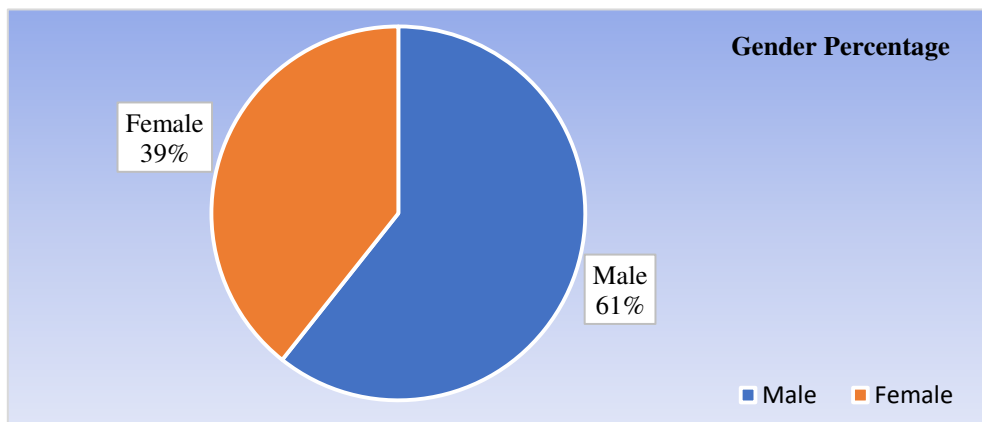


Fig. 2: Total sputum positive by gender distribution.

Table 3: Prevalence of total positive TB patients (January-December 2021).

Quarter	Bacteriologically Confirm	Clinically diagnosed	Extra-pulmonary	Re-treatment	Failure	Total patients
1 st -21	93	12	14	09	01	129
2 nd -21	102	00	20	11	01	134
3 rd -21	105	05	21	06	00	137
4 th -21	105	08	23	06	00	142
Total	405	25	78	32	02	542

Table 3 shows total positive TB patients of January-December 2021 were 542, of these bacteriologically confirm 405, clinically diagnosed 25, EP TB 78, re-treatment 32 and failure 02.

Table 4 shows total positive TB patients of 2021 were 542, of these age (0-14) were 17 positive, age (15-64) were 380 & up to age 65 were 145 positive.

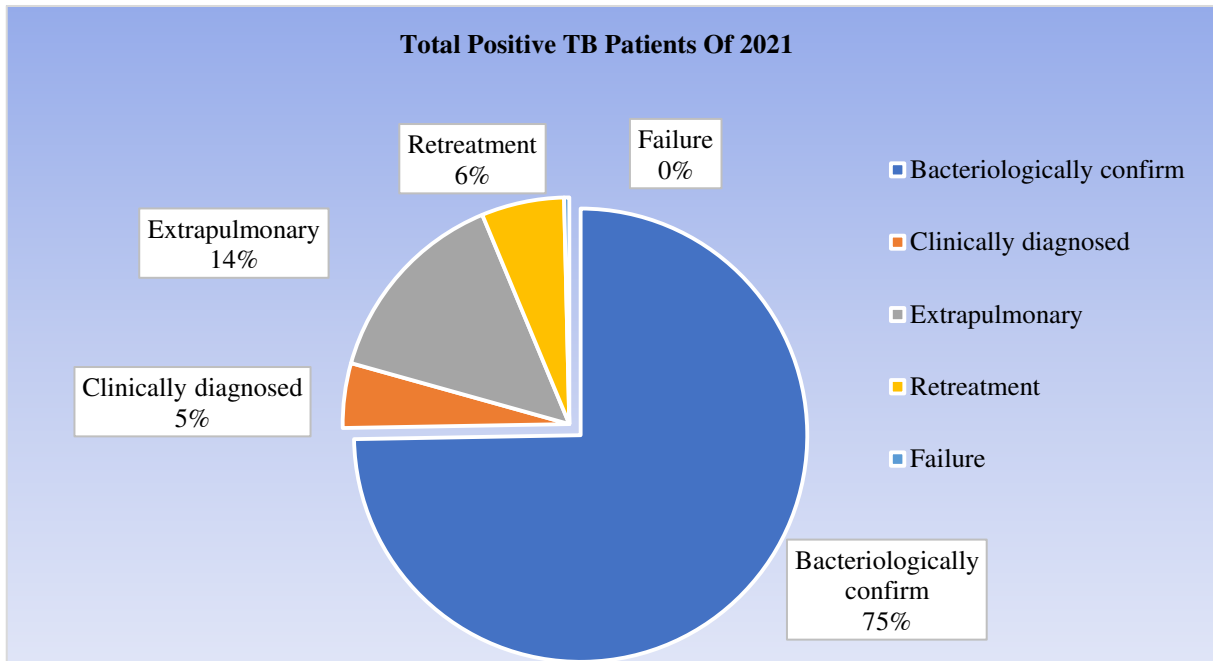


Fig. 3: Total positive TB patients of 2021 by their criteria percentage.

Table 4: Prevalence of positive TB patients by age group.

Quarter	0-14	15-24	25-34	35-44	45-54	55-64	>=65	Total
1 st -21	04	12	12	17	22	26	36	129
2 nd -21	04	13	19	21	24	22	31	134
3 rd -21	04	16	20	18	13	24	42	137
4 th -21	05	13	21	18	26	23	36	142
Total	17	54	72	74	85	95	145	542

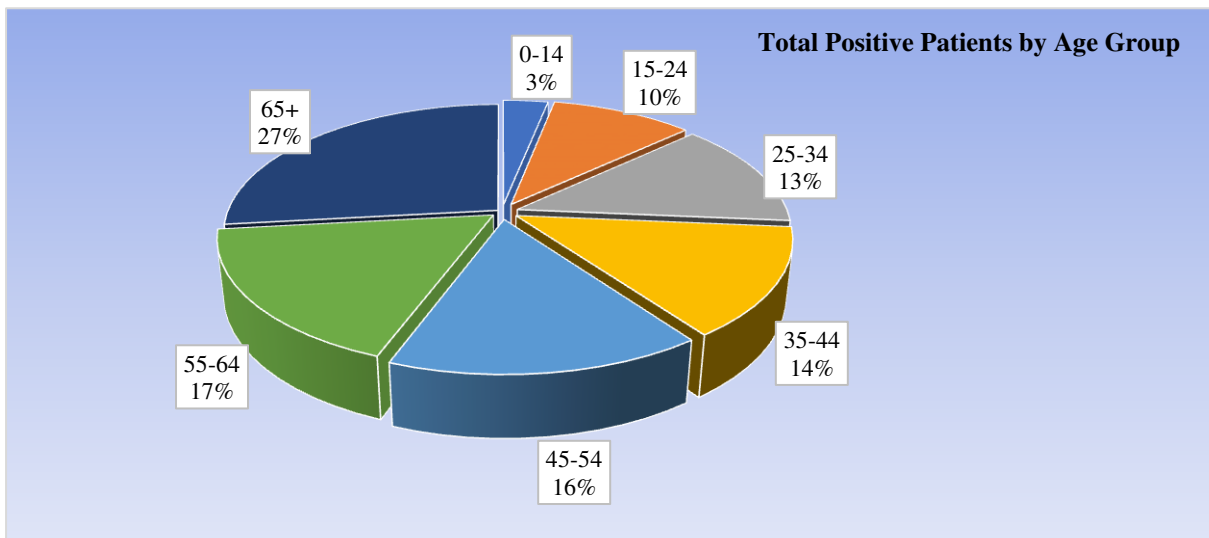


Fig. 4: Total positive TB patients of 2021 by their age group percentage.

DISCUSSION:

This study was carried out in the department of TB & Leprosy, Upazilla Health Complex, Bera, Pabna. The study was designed as prevalence of tuberculosis among the populations of Bera. The analyzed data have been presented in this chapter through UniversePG | www.universepg.com

tables and appropriate graphs. The results of the study have been described as TB is a major public health problem in Bangladesh as well as in the whole world. Tuberculosis is an ancient disease, which is still a major public health challenge in Bangladesh and remains in the 30 TB high-burden countries.

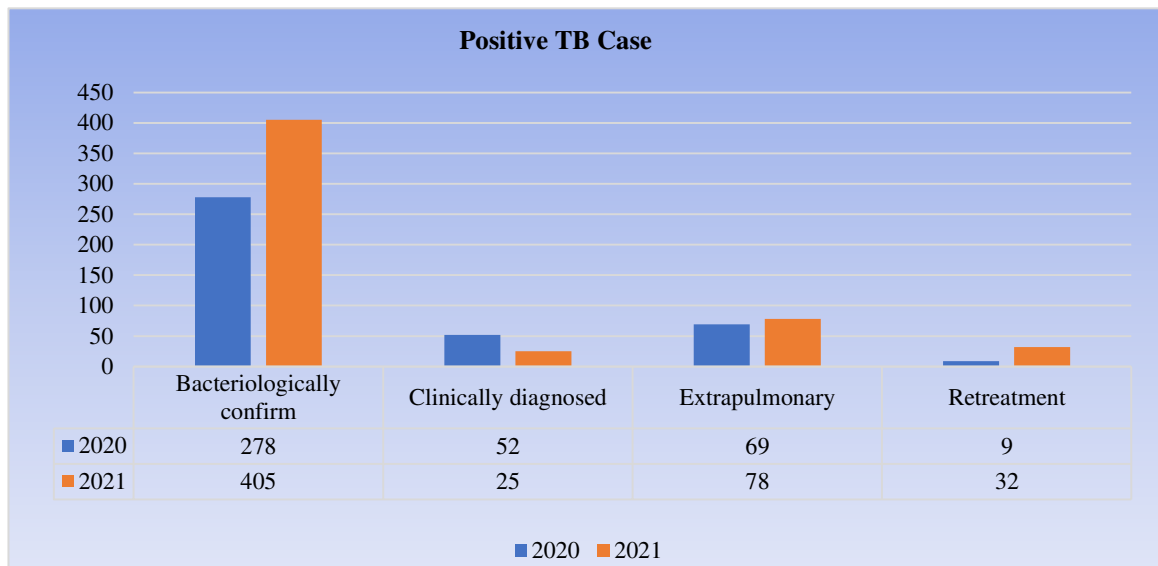


Fig. 5: Comparison of TB positive patients in 2020 and 2021.

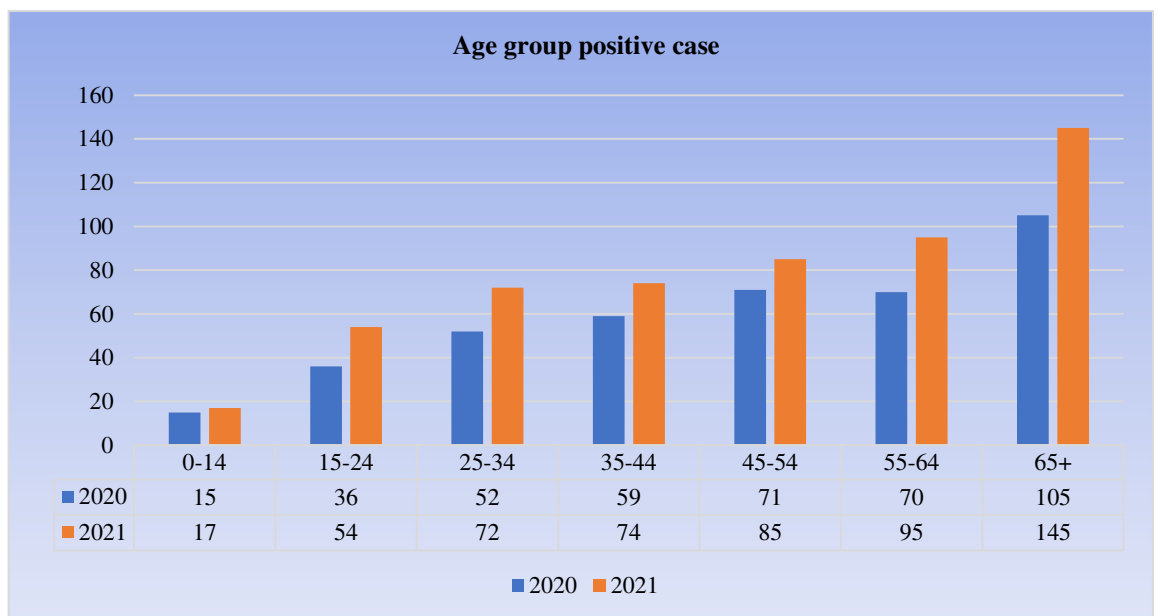


Fig. 6: Comparison of TB positive patients in 2020 and 2021 by their age group.

The problem is aggravated by the increasing population density, rapid urbanization, poverty and illiteracy (Karki *et al.*, 2017). Bangladesh is one of the high burden countries for TB in the world with annual incidence of 360,000 TB cases 44,000 death each year (WHO, 2013; Saikat *et al.*, 2020).

In our study, we collect samples and tests from January to December 2021; patients were interviewed for any suspected TB symptoms. Meanwhile, information of participant’s sex, age, education, marital status, occupation, smoking and drinking history were collected. Participants with any one of the suspected TB symptoms or CXR abnormalities consistent with TB were asked to submit sputum sam-

ples (early morning and on spot sputum) for sputum smear and Xpert test (GTR, 2020). In this study was conducted on 4353 presumptive samples were collected from 09 different unions of Bera. 4353 eligible participants for Sputum tests, of these total 2442 (56%) were male and 1911 (44%) were female. Total 417 sputum positive, of these total 417 sputum positive, 253(61%) were male and 164(39%) were female.

CONCLUSION:

Tuberculosis (TB) continues to be a global public health problem, particularly in the developing countries. Nearly one-third of the global population (i.e., two billion people) is infected with *Mycobac-*

terium tuberculosis (MTB) and is at risk of developing the disease. The TB prevalence of elderly people is very high in Bera Upazilla, Pabna, & male sex, older age, living in rural areas, underweight, diabetes, close contact of PTB and previous TB history are high risk factors. Microscopy and Xpert test together make it possible to large amount of presumptive test and diagnosed easily. Tuberculosis can be reduced only by increasing the number of tests and bringing more patients under control. We tested total 4353 sputum samples and identified 417 sputum positive TB patients. Tuberculosis (TB) is a communicable disease which causes major health problem globally. About 85% of people with TB disease can be successfully treated with a 6 month drug regimen and get benefit of curtailing onward transmission of infection. Since 2000, TB treatment has averted more than 60 million deaths. Despite being a preventable and curable disease, TB is one of the top 10 causes of death worldwide and the leading cause of death from a single infectious agent. To achieve The End TB Strategy by 2035, National Tuberculosis control program (NTP), Bangladesh is working hard for case findings and their treatment outcomes under DOTs through GO-NGO collaborating approach. Preventive treatment is available for people with TB infection. But still TB remains a major public health problem and Bangladesh is one of the high TB burden countries.

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CONFLICTS OF INTEREST:

There are no potential conflicts of interest to publish the present research work.

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