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ORIGINAL ARTICLE

Prevalence of Multidrug Resistance Tuberculosis Among Presumptive MDR-TB Patients Attending at 250 Bedded Tuberculosis Hospital

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Abstract:

The emergence of resistance to drugs used to treat tuberculosis (TB), and particularly multidrug resistant TB (MDR TB) has become a significant problem in number of countries and obstacle to effective TB control. In Bangladesh, the National Tuberculosis Control Programme (NTP) carried out its 1st national wide drug resistance survey (DRS) in tuberculosis patient in collaboration with WHO and SNRL, Antwerp, Belgium in 2010-2011. The result shows the overall number of MDR TB cases is low, 1.4% among new cases and 28.5% among re-treatment cases.

In this study, from January 2013 to September 2018 at 250 Bedded TB Hospital, Shyamoli, total presumptive MDR-TB cases were 10021. Among them MTB detected in 2188 (21.83%) patients. About 92.75% are RIF sensitive and 7.3% are RIF resistance (MDR-TB). Among the MDR-TB cases 53.4% were male and 46.58% were female. Among 161 MDR-TB cases 31.7% are Relapse ,13.04% are new cases, 6.8% are lost to Follow up cases and 48.4% are others (Non convertor of CAT I and II, CAT I and CAT II failure, close contact of MDR patients).

Our study shows that the prevalence of MDR-TB is more in retreatment cases (Relapse, Lost to follow up, Non convertor of CAT I and II, CAT I and CAT II failure, close contact of MDR patients) when compare to new cases. It should be emphasized that the prevalence of MDR-TB in new cases is higher in compare to the values stated under PMDT 2012 and WHO annual TB report 2015. This is a threat to TB control programme in Bangladesh. We have done this study on the basis of GeneXpert of sputum. Culture was not available in our institute. So MDR-TB diagnostic facility and surveillance activity should be expanded. Our study emphasize the need of first line drug sensitivity testing in all the new cases of Tuberculosis should be implanted to control, reduce the prevalence and improve the outcome of MDR –TB treatment.

Key words: *Tuberculosis (TB), Multidrug Reasistant Tuberculosis (MDR-TB), Rifampicin Resistant (RIF- resistant), Gene-Xpert, Sputum.*

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Introduction:

The emergence of resistance to drugs used to treat tuberculosis (TB), and particularly multidrug resistant TB (MDR TB) has become a significant problem in number of countries and obstacle to effective TB control[1]. According to the Global TB Report 2012 (WHO) there were an estimated incidence of 31000 MDR TB cases among notified TB patients with pulmonary TB. Among them, 3.7% (2.1-5.2%) of new cases and and 20% (13-26%) of previously treated cases are estimated to have MDR TB[2].

In Bangladesh, the National Tuberculosis Control Programme (NTP) carried out its 1st national wide drug resistance survey (DRS) in tuberculosis patient in collaboration with WHO and SNRL, Antwerp, Belgium in 2010-2011(2). The result shows the overall number of MDR TB cases is low, 1.4% among new cases and 28.5% among re-treatment cases. Although the rates of MDR TB in Bangladesh do not appear to be high, the absolute number of MDR TB cases in higher considering the overall high TB burden[2].

In present study, we have estimated the prevalence of MDR-TB (defined as resistance to Rifampicin in Gene-Xpert of sputum) in MDR-suspect patients attending at 250 Bedded TB Hospital from January 2013 to September 2018. These MDR-suspect patients (according to Guidelines on Programmatic Management of Drug Resistant TB (PMDT) in Bangladesh April, 2013) include any TB patient who fails category I and II, non converters of Category I and II, Relapses (Category I / Category II), Treatment after loss to follow up (Category I/ Category II), close contacts of MDR TB, HIV infected patients.

Materials & Methods:

This retrospective observational study was conducted at 250 Bedded TB Hospital that involved all MDR-suspects attending from January, 2013 to September, 2018. All data were collected from hospital records.

After identifying potential MDR-TB suspect cases, early morning sputum samples were collected from each patient and Gene-Xpert(Cepheid, 16 module) was done.

Genotyping drug susceptibility testing: For each of the samples, unscrew lid of sputum collection container, add Sample Reagent 2:1 (v/v) to the sample, replace the lid, and shake vigorously 10-20 times. Incubate for 15 minutes at room temperature. At one point between 5 and 10 minutes of the incubation again shake the specimen vigorously 10-20 times. Samples should be liquefied with no visible clumps of sputum. Particulate matter may exist that is not part of the sample. At least 2 ml, of processed sample was taken with the plastic transfer pipette from the collection container to the single-use, disposable, self contained GeneXpert cartridge. Then it was subjected to GeneXpert MTB/RIF to creat a test result were noted after 2 hours[3].

Result:

In this study, from January 2013 to September 2018 at 250 Bedded TB Hospital, Shyamoli, total presumptive MDR-TB cases were 10021. Figure 1 shows that among 10021 cases, MTB detected in 2188 (21.83%) patients. About 92.75% are RIF sensitive and 7.3% are RIF resistance (MDR-TB). Table 1 shows that among the MDR-TB cases 53.4% were male and 46.58% were female. According to Table 2 among 161 MDR-TB cases 31.7% are Relapse, 13.04% are new cases, 6.8% are lost to Follow up cases and 48.4% are others(Non convertor of CAT I and II, CAT I and CAT II failure, close contact of MDR patients).

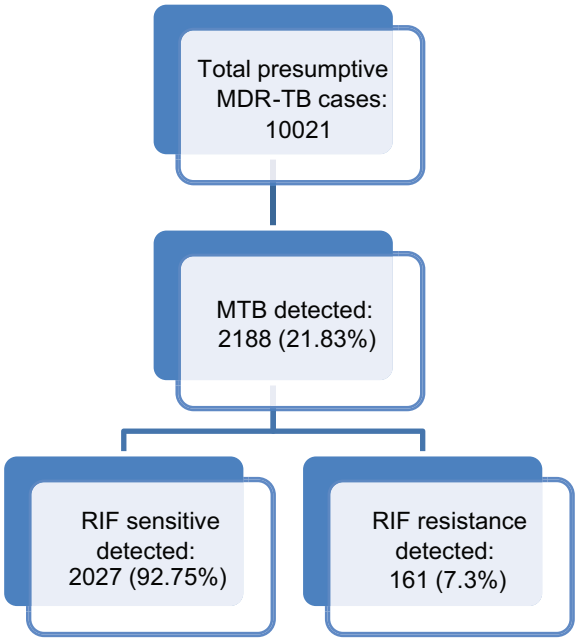

Figure 1: p*revalence of multidrug resistant tuberculosis (MDR-TB)*

Table-I

Sex distribution of MTB detected cases

Sex	MDR-TB cases	NonMDR-TB cases	Total
Male	86 (53.4%)	1546 (76.27%)	1632
Female	75 (46.58%)	481(23.72%)	556
Total	161	2027	2188

Table-II

Distribution of Rifampicin resistance cases according to patient´s category.

Groups	Relapse	New cases	Lost to Follow up	Others	Total
MDR-TB	51(31.7%)	21(13.04%)	11(6.8%)	78(48.4%)	161
Non MDR-TB	926(45.68%)	765(37.74%)	144(7.1%)	192(9.47%)	2027
Total	977	786	155	270	2188

Table-III

Distribution of MTB cases according to patient's category (N=2188)

Groups	Relapse	New cases	Lost to Followup	Others	Total
	977	786	155	270	2188
	(44.65%)	(35.92%)	(7.08%)	(12.34%)	(21.83%)

Table-IV

Distribution of MTB cases according to patient's category

Characteristics	MDR TB		Non MDR TB		OR	95% Cl	P value
Reoapse case versus new case	51	21	926	765	2.0	1.2-3.4	p=0.01*
Lost to follow up vs new case	11	21	144	765	2.78	1.3-5.9	p=0.01*
Relapse case vs lost to follow up	51	11	926	144	0.72	0.4-1.4	p=0.44

*significant

Discussion:

Pulmonary Tuberculosis (TB) is a contagious bacterial infection that involves the lungs but may spread to others organs. Pulmonary tuberculosis is caused by Mycobacterium tuberculosis. One gets TB by breathing in air droplets from a cough or sneeze of an infected person[4]. According to WHO, TB patients resistant to at least two drugs (Rifampicin and Isoniazid) are called multidrug resistant tuberculosis (MDR-TB)[5]. Now a days this is a serious threat in developing countries[6]. MDR-TB most commonly develops due to inappropriate treatment, patient missing doses, failing to complete their treatment[7].

According to the Global TB Report 2012 (WHO) there were an estimated incidence of 31000 MDR TB cases among notified TB patients with pulmonary TB. Among them, 3.7% (2.1-5.2%) of new cases and and 20% (13-26%) of previously treated cases are estimated to have MDR TB. According to PMDT May 2012, the prevalence of MDR-TB in India to be about 3% in new cases and 12-17% in re treatment cases[8]. In this study also shows, Among the 161 MDR-TB cases 31.7% are Relapse, 13.04% are new cases, 6.8% are lost to Follow up cases and 48.4% are others (Non convertor CAT I and II, CAT I and CAT II failure, close contact of MDR patients). That proves that relapse cases are more prone to develop MDR-TB.

In India among the MDR-TB cases, 14.89% were male and 12.5% were female. In this study, we observe 53.4% were male and 46.58% were female, which are more or less same proportion. These two studies reveal that sex distribution is not an important indicator to develop MDR-TB.

Conclusion and Recommandation:

Our study shows that the prevalence of MDR-TB is more in retreatment cases (Relapse, Lost to follow up, Non convertor CAT I and II, CAT I and CAT II failure, close contact of MDR patients) when compare to new cases. It should be emphasized that the prevalence of MDR-TB in new cases is higher in compare to the values stated under PMDT 2012 and WHO annual TB report 2015.(TB1) This is a threat to TB control programme in B angladesh. We have done this study on the basis of GeneXpert of sputum . culture was not available in our institute. So MDR-TB diagnostic facility and surveillance activity should be expanded. Our study emphasize the need of first line drug sensitivity testing in all the new cases of Tuberculosis should be implanted to control, reduce the prevalence and improve the outcome of MDR –TB treatment.

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