



## A Comparative study of Tuberculosis MDR Cases in HIV and non –HIV Person of Coal field area of Dhanbad

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### Abstract

*The HIV and Tuberculosis is one of the major health challenges in the present time. Many people's suffering co-infection with HIV and tuberculosis in Jharkhand and other state of India. Mycobacterium tuberculosis is the most common cause of Tuberculosis because of airborne transmission mode.<sup>{1,2}</sup> HIV may be transmitted through sexual intercourse and certain body fluids that are capable of containing high concentration of HIV. These fluids included blood semen, vaginal and rectal secretions. HIV weakens the immune system and increase the risk of TB <sup>{3,}</sup> HIV with TB is called HIV /TB co-infection <sup>{3, 4}</sup>. This study will focus on HIV/TB co-infection having Multi drug resistant tuberculosis.<sup>{4}</sup> this study is done with the name, address, and any other contacts of the Person will be kept secret.*

**Materials and Methods:** All Study was done at the department of Microbiology PMCH Dhanbad from December 2018 to December 2019 with the help of RNTCP Designated Microscopy centers (DMC) and Integrated Counseling and Testing center (ICTC) at PMCH Dhanbad. All 262 blood and sputum samples were collected in the (Designated Microscopy Centre) RNTCP and Integrated Counseling and Testing center at Patliputra Medical college and hospital. All blood / sputum samples were sent to the Central Research laboratory PMCH Dhanbad.

**Result:** In our study we have found that the Tuberculosis infection is much higher than for HIV. In this study we have found the HIV/TB co infected Patients Rifampicin drug resistant percentage is higher than for Isoniazid drug. This investigation non-infection HIV patients and co- infected HIV/TB patients Isoniazid less resistant than Rifampicin.

**Keywords:** Rifampicin, Isoniazid, Fluorescence Microscopy, MGIT, Multi drug Resistant.

### Introduction

Tuberculosis and HIV are global public health problem. TB has been identified as one of the leading cause of death among HIV-infected

persons .People living with HIV infected with Mycobacterium Tuberculosis are at 25 times greater risk of developing TB compared with HIV non- infected-person.<sup>{5}</sup> On average, 0.6 % of the

TB patients were infected both with HIV and MDR- TB. According to(WHO).<sup>{6,7}</sup> Tuberculosis is one of the most common infection in HIV immune compromised Patients leading to death of co-infected Patients.<sup>{8,9}</sup> These disease co-infection HIV drives a decline in immunity while tuberculosis progresses due to defective immune status<sup>{9,10}</sup> This condition becomes more severe in case of any stage of HIV infection.<sup>{11,12}</sup> This study Helps to identified HIV/TB co-infection Multi drug resistant tuberculosis in the coal field area of Dhanbad district of Jharkhand. In our study we have used HIV/Tb suspected Samples and which includes some HIV reactive patients through help of ICTC and RNTCP.

### Materials and Methods

All Study was done at the department of Microbiology PMCH Dhanbad from December 2018 to December 2019 with the help of RNTCP Designated Microscopy centers (DMC) and Integrated Counseling and Testing center (ICTC) at the PMCH Dhanbad. All of 262 suspected blood and sputum samples were collected in the (Designated Microscopy Centre) RNTCP and Integrated Counseling and Testing center at Patliputra Medical college and hospital. All blood / sputum samples were sent to the Central Research laboratory PMCH Dhanbad.

**Sample collection Procedure:** The samples collection will follow the procedure of Revised National Tuberculosis Control program (RNTCP). The diagnosis of pulmonary tuberculosis is primarily sputum based in accordance with the WHO guidelines. All Sputum samples were collected by the use of large Mouthed screw capped leak proof 50 ml plastic container. All Blood samples were collected under NACO guideline by using sterilized 3 ml syringe and 5ml vial. In our study we have used HIV/TB suspected Blood/Sputum Samples and which include some HIV reactive patients through the help of ICTC and DMC with the name, address, and any other contacts of the Person will be kept secret.

**Sputum Microscopy:** Sputum Microscopy examination done by using Fluorescence microscopy Method.

**Mycobacteria Growth Indicator Tube:** Mycobacterium Growth indicator tube is used for the detection of Mycobacterium Tuberculosis. The Complete Medium with OADC enrichment and PANTA antibiotics mixture.

**Identification of Multidrug Resistant Tuberculosis:** In Mycobacterium growth indicator tube tuberculosis bacteria will grows in the presence of tuberculosis drugs. If then bacteria grows then they are resistant to the drugs. Drugs could not stop their growth.

**HIV Test and confirmatory Test:** If the combs test is reactive then confirmation is done by Meril<sup>l</sup>'s rapid kit is used. If second kit test is also reactive then 3<sup>rd</sup> Aids scan kit is used for conformation According to NACO guidelines.

**Age and Sex Predilection of HIV/TB:** In this study all patients of both genders who were more than 18 years of age and Suspected of having HIV and Tuberculosis were included.

**Statistical Analysis:** All Data were analyzed with standard statistical method, percentage were computed for all variables results were presented in the form of table and column.

### Result

In our study we have used HIV/TB suspected Blood/Sputum Samples and which include some HIV reactive patients through the help of ICTC and DMC with the name, address, and any other contacts of the Person will be kept secret. In this study a total number of 262 suspected blood samples of HIV and total 262 suspected Sputum samples were collected and investigate by the microbiology standard procedure in the department of Microbiology of the Patliputra Medical Collage and Hospital Dhanbad. In this study we Found that the total number of male patients were 163 (62%) and the total numbers of female patients were 99 (38%) **According to (Table 1).** In our study total numbers of Positive Sputum samples 115 (44%) and total numbers of

negative Sputum samples 147 (56%), overall total Sputum samples 262 (According to Table 2.). The total number of HIV reactive Blood Samples 87 (33%) and the total number of HIV non-reactive Blood samples 175 (67%) overall total Blood samples is 262 (According to Table 3.). We have found this Tuberculosis (44%) infection is much more higher than for HIV 33%. According (Table 2 & 3). After Our investigation we have found that a total number of 87 blood samples is HIV reactive and done Fluorescence Microscopy examination of a total numbers of 31 (36%) samples is sputum positive (approx. 36%) positive and a total number of negative samples is 56 (approx. 64%). We have examined approximately 87 blood HIV Reactive samples 31

Patients samples were Both HIV reactive and Sputum Positive. (According to Table No-4.). In our investigation we have found that Total Number of Non HIV infected TB Patients is 31. Out of 31 HIV Reactive Patients 6 (19%) Patients were Rifampicin resistant and 4 (12%) Patients were Isoniazid resistant. Out of 31 HIV/TB Co-infected Patients 3 (9.6%) patients we are found Multi Drug resistant. (According to Table No5.). In our last table (No-6), in our study we have found that total Number of Non HIV infected TB Patients is 175. Out of which 25 (14%) Patients Sputum Samples is Rifampicin resistant and 16 (9.1%) Sputum Samples Isoniazid resistant. We have also found Multi Drug Resistant is 4 (2.2%) out of 175. (According to Table No 6.).

**Table- 1** Sex wise distribution among total blood & Sputum Samples

Total Numbers of Samples.		Gender			
		Male	Total (%)	Female.	Total (%)
Blood	262	163	62.2	99	38
Sputum	262	163	62.2	99	38

**Table.2** Fluorescence Microscopy Total No. of Positive and Negative samples & %

Total Numbers of Sputum Samples.	Fluorescence Microscopy (Mycobacterium Tuberculosis).			
	Total No of Positive samples.	Total (%)	Total No of Negative Samples.	Total (%)
262	115	44%	147	56%

**Table.3** Total No of blood samples HIV Reactive and Non-Reactive with %.

Total Number of Blood samples.	1 <sup>st</sup> HIV test		Total	2 <sup>nd</sup> Confirmatory Test		3 <sup>rd</sup> Confirmatory Test.		Total (%)	
	Combs Test.			Merils Rapid Kit Test.		Aids scan Rapid kit Test.		Reactive	Non-Reactive
	Reactive	Non-Reactive	Reactive	Non Reactive	Reactive	Non-Reactive			
262	87	175	262	87	00	87	00	33%	67%

**Table- 4** Total HIV Reactive samples Fluorescence Microscopy result

Total No of HIV Reactive Samples.	Fluorescence Microscopy. Total No of Sputum Positive samples.			
	Positive.	Total (%)	Negative.	Total (%)
87.	31	36%	56	64%

**Table-5** HIV/TB Co infected Patients Drug Sensitive Test with %.

Total Number Of HIV/TB Co infected Patients.	Drug Sensitive Test MGIT					
	Rifampicin (Resistant)	Total (%)	Isoniazid. (Resistant)	Total (%)	(Multi drug Resistant) Rifampicin/ Isoniazid	Total (%)
31.	06	19 %	04	12 %	3	9.6%

**Table-6** Non HIV TB infected patients Drug Sensitive Test with %.

Total Number of Non HIV TB infected patients	Drug Sensitive Test MGIT					
	Rifampicin	Total (%)	Isoniazid	Total (%)	(Multi drug Resistant) Rifampicin/ Isoniazid	Total (%)
175	25	14 %	16	9.1 %	4	2.2%

## Discussion

This study shows the HIV /TB Co-infections is Major Health problems of worldwide. The HIV /TB Co-infected Patients suffering from Multi drug resistant tuberculosis because of HIV weakens the immune system of the body and increases the risk of TB with Multi drug resistant tuberculosis.<sup>{13,14}</sup> That is caused by Mycobacterium Tuberculosis that are resistant to some of the most effective anti –TB drugs. In our study focus the HIV/TB co- infection & multi drug resistant tuberculosis in the coal field area of dhanbad District of Jharkhand. In This study all patients of both genders who were more than 18 years of age and Suspected of having HIV and Tuberculosis were included. Our study from blood and Sputum samples were divided into Males and Females sex groups according to their sex (**According to Table Table 1**). In This study total of 262 sputum samples were collected .There were 115(44%) sputum samples were positive and 147 (56%) sputum samples were Negative. The total number of tuberculosis affecting Males 73 and female 42 (**According to Table Table- 02**), There were 87 blood Samples were reactive of HIV (**Table-03**). In This study 87 HIV reactive blood samples and 31 samples were HIV /TB co-infected. (**According to Table Table-04**) Total HIV /TB co-infected patients were 31 in our study of 06 samples were Rifampicin resistant and 04 samples were resistant to isoniazid and 03 samples were multi drug resistant. (**According to Table Table 5**).

## Conclusion

In this study show that HIV/TB co-infected patients Rifampicin drug resistant and Multidrug resistant percentage much higher than for non HIV infected tuberculosis patients. In Our investigation we found that the isoniazid both resistant in HIV/TB co- infected patients and non-HIV tuberculosis patients but HIV/TB co- infected patients more higher resistant than non-tuberculosis patients.

**Declaration:** This study is done with the name, address, and any other contacts of the Person will be kept secret. **Duration of study:** One Year.

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Institutional Ethics Committee, Patliputra Medical Collage, Dhanbad.

**IEC PMCH Register by:** (The Central Drugs Standard Control organization)

Director General of Health Services, Ministry of Health & Family Welfare, government of India.

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