

## Trend of HIV-TB co-morbidity in north-west region of Uttarakhand

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### Abstract

Tuberculosis (TB) is the commonest opportunistic infection and the number one cause of death in HIV patients in developing countries. HIV co-infection is the most powerful known risk factor for progression of M. tuberculosis infection to active disease, increasing the risk of latent TB reactivation. The study was carried out to study the trend of Tuberculosis in HIV seropositive patients and determine HIV-TB co-morbidity in Dehradun, Uttarakhand. A retrospective study of standardized patient records was conducted from December 2017 to November 2018 of all HIV sero-positive patients registered to ART PLUS Centre Govt. Doon Hospital Dehradun. TB suspected patients were referred to RNTCP. Data was taken and analyzed by Microsoft Excel. Among total of 18319 HIV positive patients attending ART centre (ART and Pre- ART enrolled) during the study period, 585 patients were suspected of TB and were referred from ART to RNTCP. Total 128 (21.9%) patients were diagnosed with TB, of which 71(55.46%) patients were diagnosed for pulmonary TB and 57(44.5%) were Extra-Pulmonary TB. In our study Male predominance was seen and most of the cases were of age group 19-40 years, mostly belonging to rural areas.

**Keywords:** HIV/AIDS, Tuberculosis, Co-infection.

### Introduction

HIV-TB is leading causes of infectious disease-associated mortality worldwide.<sup>1</sup> As per India HIV Estimation 2017 report, adult HIV prevalence at national level has continued its steady decline from an estimated peak of 0.38% in 2001-03, 0.34% in 2007, 0.28% in 2012 and 0.26% in 2015 to 0.22% in 2017. Ten states account for 82% of the total estimated people living with HIV in the country: Maharashtra, Andhra Pradesh, Karnataka, Telangana, West Bengal, Tamil Nadu, Uttar Pradesh, Bihar, Gujrat, and Rajasthan. The remaining states account for 18% of total people living with HIV.<sup>2</sup>

HIV infection being an immunosuppressive disease predisposes patient with latent tuberculosis infection to develop tuberculosis disease. The immunosuppression also leads to reactivation of old tuberculosis infection and to previously treated patient being easily re-infected when exposed to a patient with the disease.<sup>3</sup> On the other hand TB accelerates HIV disease progression, increasing infectivity and reducing HIV treatment efficacy.<sup>4,5</sup>

Tuberculosis (TB) is the commonest opportunistic infection and the number one cause of death in HIV patients worldwide.<sup>6</sup> TB caused total 1.3 million deaths in HIV negative people and additional 300,000 deaths among HIV positive people in 2017, most of the cases occurred in Africa (84%).<sup>7</sup> Globally PLHIV were 20 times more likely to fall ill with TB than those without HIV. Routine screening for TB symptoms of all PLHIV is essential for ensuring early detection.<sup>8</sup> The present study was done to assess the trend of tuberculosis in HIV seropositive patients and determine HIV-TB co-morbidity in those patients attending the ART centre in Dehradun, Uttarakhand.

### Materials and Methods

It is a retrospective study of standardized patient

records conducted at antiretroviral (ART) Plus Centre, Govt. Doon Hospital Dehradun during the time period from December 2017 to November 2018. Total 18319 HIV seropositive patients attending ART centre (ART and Pre-ART enrolled) including both male and female were taken. Out of them depending upon the history, general and systemic examination patients suspected of Tuberculosis (both pulmonary and extra-pulmonary) were referred from ART to RNTCP where relevant samples were obtained and screened for Tuberculosis. Following data collection, data was entered in Microsoft Excel and analyzed using data analysis tool of MS excel.

### Results

A total of 18319 HIV seropositive (ART and Pre-ART enrolled) patients attended the ART Centre during the study period were included in the study. Depending upon the history, general and systemic examination, 585 patients were suspected of TB and were referred from ART to RNTCP. Among total 585 TB suspected cases, total 128 (21.9%) patients were positively diagnosed for TB. 105 patients (82.04%) were male and 23 patients (17.96%) were females. Out of the total 128 TB Positive Cases, most of the cases 79(61.7%) were in the sexually active age group between 19-40 years of age followed by 37 (28.9%) cases from age group between 41-60 year. A total of 71(55.46%) patients were diagnosed with pulmonary TB and 57(44.5%) were diagnosed Extra-Pulmonary TB (Table 1 and 2).

**Table 1: Distribution of PTB and EPTB**

Gender	Total	PTB	EPTB
Male	105	56	49
Female	23	15	8

**Table 2: Monthly RNTCP referred and diagnosed TB cases in HIV seropositive patients**

Month	No. of HIV positive pt. attending ART centre during the month (Pre-ART and ART)	No. of TB Suspects referred from ART to RNTCP	Total Diagnosed TB Patients	Percentage
December-17	1437	27	5	0.33%
January-18	1433	31	5	0.34%
February-18	1436	54	13	0.9%
March-18	1517	60	17	1.12%
April-18	1468	49	14	0.95%
May-18	1756	79	16	0.91%
June-18	1545	47	10	0.64%
July-18	1491	54	9	0.61%
August-18	1505	53	11	0.73%
September-18	1515	45	7	0.46%
October-18	1555	44	9	0.57%
November-18	1661	42	12	0.72%

**Table 3: Gender and age wise distribution of diagnosed TB in HIV sero-positive cases**

Sex	Number of Patients	Percentage
Male	105	82.04%
Female	23	17.96%
Age	Number of patients	Percentage
0-18 years	9	7.03%
19-40 years	79	61.7%
41-60 years	37	28.9%
>60 years	3	2.3%
Area	Number of patients	Percentage
Rural	74	57.8%
Urban	54	42.2%
Marital status	Number of patients	Percentage
Single	24	18.8%
Married	76	59.3%
Divorced/Separated	28	21.9%

Majority of the cases (57.8%) belonged to rural areas as compared to 42.2% from urban areas. Most of the patients were married (59.3%), (21.9%) were divorced/separated and 18.8% were single (Table 3).

## Discussion

Persons co-infected with *M. tuberculosis* and HIV have 5%-8% annual risk and 30% or greater life time risk of developing active tuberculosis.<sup>9</sup> Overall TB prevalence in HIV seropositive patients in our study was 21.9% which is similar to other studies done in other parts of the country.<sup>10-13</sup> The current HIV prevalence rate in India has declined from 0.38% in 2001 to 0.22% in 2017<sup>2</sup> which may be due to increased awareness of HIV and TB, free Antiretroviral therapy (ART) through ART centers, link centers and it can also be credited to better implementation of RNTCP programme. These programs aim to provide universal access to life saving ART for all, providing direct access to free diagnostic facilities, free first line therapy, second and third line ART, prevention from transmission.<sup>11</sup> There is an increase in the number of free treatment centers, provided by the Government.

The WHO Interim Policy on TB-HIV recommends HIV testing among TB patients as an entry point for integrated HIV-TB care and surveillance, with an additional aim of reducing the burden of HIV in patients with presumptive

and diagnosed TB.<sup>10</sup> National Framework for Joint HIV/TB Collaborative Activities is a joint national policy first developed in 2007 and revised in 2009 and 2013. It was developed with the intention to ensure early detection and prompt linkage of TB and HIV cases to care, support and treatment. Four pronged strategy, which include prevention, early detection of TB/HIV, prompt treatment and management of special TB/HIV cases, was adopted for mitigating the effects of TB HIV co-infection. Under this, provider initiated HIV testing and counselling (PITC) among TB patients along with provision of HIV prevention education for patients with presumptive or diagnosed TB cases have been listed as important activities, amongst others, to be undertaken to reduce burden of HIV among TB patients.<sup>11</sup>

In our study male predominance was seen which was also seen in other studies done by Kumari R et al, Ramachandra et al and similar studies<sup>12-14</sup> and most of the cases were of age group 19-40 years as also seen in other studies.<sup>13,14</sup> Most of the cases were from rural area which is similar to a study done earlier by Ramachandra et al.<sup>13</sup> Most

common presentation being pulmonary tuberculosis 71(55.46%) followed by extra-pulmonary 57(44.5%) which is similar to a previous study done by Ramachandra et al.<sup>13</sup> Mortality in our study was 9.4%.

### Conclusion

The present study brings into light the double trouble of TB and HIV in this region of Uttarakhand state where each disease augments the risk for the other, manifolds. The study reveals the importance of collaborating ART and RNTCP which has been already emphasized by the National Framework for Joint HIV/TB Collaborative Activities before. The Medical Officers, Physicians and Pulmonologists should try to recognize the symptoms for either disease and scan for the other at the earliest so that the morbidity and mortality can be brought to minimum levels.

**Conflict of Interest:** None.

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