

## Clinicoepidemiological trend of tuberculosis in garhwal region.

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### Abstract

**Background & objective:-** There are very limited data regarding clinico epidemiological characteristics of Tuberculosis patients in remote places likes hills of India. This study analyzes the clinical and sociodemographic characteristics of Pulmonary & Extra pulmonary Tuberculosis in Hills of Uttarakhand.

**Methods:** - We follow all patients coming to medical OPD between 1<sup>st</sup> January 2009 to 31<sup>st</sup> December 2011 . We assess number and trend of Pulmonary & Extra pulmonary tuberculosis cases along with evaluation of clinico sociodemographic characteristics' of Tuberculosis patients.

**Result:** - A total of 844 (18.26% of Pulmonary TB suspect) pulmonary TB patients put on DOTS treatment in between 2009 to 2011. Pulmonary TB patients comprises higher percentage of male (71.80%) than female (28.19%). 588 patients (12.72% of PTB suspect) found as sputum positive Pulmonary Tuberculosis and 256 patients (5.53% of PTB suspect) as sputum negative tuberculosis. EPTB comprises 15.85% of total TB patients put on DOTS treatment and if we calculate year wise then 9.59% in 2009 and 17.59%, 20.75% in 2010, 2011 respectively. The commonest site of Extra pulmonary TB is Tubercular lymphadenitis (37.37%) followed by pleural effusion (25.15%), Abdominal Koch (15.09%) and others.

**Conclusion:-** The sputum positivity rate and male predominance of Pulmonary tuberculosis found in hill of Garhwali was similar to national figures in compare to extra pulmonary Tuberculosis was more frequent in females . The most common extra pulmonary Tuberculosis was Tubercular lymphadenitis.

**Keywords—**AFB. Acid fast bacilli, TB. Tuberculosis, PTB. Pulmonary Tuberculosis, EPTB. Xtrapulmonary Tuberculosis, DOTS. Directly observed treatment shortcourse, RNTCP. Revised national Tuberculosis control programme

## I. INTRODUCTION

Tuberculosis, an infection caused by Mycobacterium tuberculosis, is a worldwide pandemic, and the Centers for Disease Control and Prevention (CDC) state that one-third of the world's population is infected with the bacteria. India, with its population of over 1000 million, is estimated to account for nearly 30 per cent of the global tuberculosis burden<sup>1</sup>. Tuberculosis continues to be a major health problem in India because of its high mortality and morbidity<sup>2</sup>. Baseline data on the tuberculosis situation is essential to know the extent of the problem and also to know the impact of the control programme in the population. A nation-wide disease survey conducted by the Indian Council of Medical Research (ICMR) during 1955-58 provided, for the first time, information on the tuberculosis status in the general population of the country. The survey however did not assess much about tuberculosis status in this region of country.

People of Garhwal hills are of Indo-Aryan ethno-linguistic group who primarily live in this part of the country. Since no information about TB situation of this region is available, the present study was conducted to estimate the clinic epidemiological characteristic of TB patients of Garhwal region of Uttarakhand.

## II. MATERIALS AND METHOD

### Study Area

The study was conducted by Department of Chest & TB VCSG Government medical college, Srinagar - Garhwal, Uttarakhand in association with Department of ENT VCSG Government medical college, Srinagar - Garhwal, Uttarakhand. The source of patient in our college is mainly from district Pauri Garhwali, Rudraprayag, Chamoli and Tehri.

### Study design & Data collection

**Type of Study:** Hospital based cross sectional study.

**Study Period:** The study was conducted from 1<sup>st</sup> January 2009 to 31<sup>st</sup> December 2011.

### III. METHOD

The study includes all patients coming to medical OPD from 1<sup>st</sup> January 2009 to 31<sup>st</sup> December 2011. All patients were evaluated and standard diagnostic criteria used for diagnosis of Pulmonary and Extra pulmonary Tuberculosis. Standard RNTCP diagnostic algorithm for PTB was followed, which includes all patient attending our OPD with history of cough for more than three weeks and later on after amendment in pulmonary Tuberculosis diagnostic algorithm we consider all patients with history of cough for more than two weeks for sputum microscopy. The patients were requested to submit three sputum samples (two on the spot and one of early morning) for sputum AFB microscopy and later on after amendment two sputum samples (one on the spot and one of early morning). We find all tuberculosis cases including Pulmonary and extra pulmonary tuberculosis cases channeled through DOTS centre. Information on patients' socio-demographic characteristics, cough duration in days or weeks and sputum results were also recorded. The study intended to identify sociodemographic pattern and trend of Tuberculosis in Last three years in this region.

#### Operational definitions

**A PTB suspect:** Any patient attending our OPD with history of cough for three weeks (after amendment two) or more.

#### Sputum positive PTB:

Patients with at-least two sputum specimens positive for acid –fast bacilli (after amendment at least one sputum specimen positive for acid-fast bacilli by microscopy)

#### Sputum negative PTB:

Patients who fulfills all the following criteria:

Two sets (taken at least 2 weeks apart) of at least two ( after amendment at least one )sputum specimen negative for acid –fast bacilli on microscopy;

Radiographic abnormalities consistent with pulmonary TB and a lack of clinical response despite one ten to fourteen days of a broad spectrum antibiotics;

Decision by a physician to physician to treat with a full curative course of anti-TB chemotherapy.

EPTB: A patients with active tuberculosis of any part of body other than Lungs is a case of Extrapulmonary Tuberculosis.

#### Ethical considerations

Informed consent was sought from the patients. Patients were informed about the nature and the purpose of the study. It was explained to the subjects that the information they give us will be kept confidential. Data analysis has been done using SPSS version 15.0 and Microsoft Office Excel 2007

### RESULT

**Table 1: Year wise incidence of pulmonary tuberculosis**

Year	Total OPD patients	Total Pulmonary suspect (% of Total OPD patients)	Pulmonary tuberculosis patients			Prevalence of sputum positive pulmonary Tuberculosis in base hospital
			Sputum +ve(% of PTB suspect)	Sputum –ve(% of PTB suspect)	Total	
2009	40037	1608 (4.01%)	204 (12.71%)	107 (6.65%)	311 (19.34%)	7.76cases /1000
2010	44372	1565 (3.52%)	187 (11.945%)	94 (6.00%)	281 (17.95%)	6.33cases /1000
2011	42402	1448 (3.41%)	197 (13.60%)	55 (3.79%)	252 (17.40%)	5.94cases /1000
Total	126811	4621(3.64%)	588 (12.72%)	256 (5.53%)	844 (18.26%)	6.65 cases/1000

**Table 2. Age-wise distribution of tuberculosis cases**

Age	Total TB cases	Total PTB cases	Total EPTB cases
0-15	45(4.48%)	22(2.60%)	23(14.46%)
16-30	243(24.22%)	167(19.78%)	76(47.79%)
31-45	300(29.91%)	274(32.46%)	26(16.35%)
46-60	270(26.91%)	245(29.02%)	25(15.72%)
>60	145(14.45%)	136(16.11%)	9(5.66%)
Total	1003(100%)	844(100%)	159(100%)

**Table 3. Sex distribution of Pulmonary Tuberculosis**

	Total PTB cases	Male	Female
2009	311	220	91
2010	281	195	86
2011	252	191	61
Total	844	606	238

**Table 4. Prevalence of Pulmonary tuberculosis and extra pulmonary tuberculosis**

Year	Total TB cases	Total PTB cases	Total EPTB cases
2009	344(100%)	311(90.40%)	33(9.59%)
2010	341(100%)	281(82.40%)	60(17.59%)
2011	318(100%)	252(79.24%)	66(20.75%)
Total	1003(100%)	844(84.41%)	159(18.83%)

**Table 5. Age wise incidence of Extrapulmonary Tuberculosis**

Age	Total Case	Male	Female
0-15	23	07	16
16-30	76	38	38
31-45	26	09	17
46-60	25	11	14
>60	09	07	02

**Table 6. Sex wise distribution of different EPTB cases**

Types of EPTB	Total	Male ( )	Female ( )
Lymphadenitis	60	16	44
Pleural effusion	40	23	17
Abdominal Koch	24	18	6
Others	35	15	20
Chi square = 19.44, d.f. = 3, p value = 0.0002			

**Table 7. Types of Extra pulmonary Tuberculosis**

Types	2009	2010	2011	Total
TB lymphadenitis	14	24	22	60
Pleural effusion	8	14	18	40
Abd Koch	6	8	10	24
Others	5	14	16	35
Total	33	60	66	159
	Chi square = 1.07, d.f. = 3, p value = 0.78 (association between 2009 and 2010 data)	Chi square = 0.50, d.f. = 3, p value = 0.91 (association between 2010 and 2011 data)	Chi square = 1.56, d.f. = 3, p value = 0.66 (association between 2009 and 2011 data)	

126811 patients attended our OPD between 1<sup>st</sup> January 2009 to 31<sup>st</sup> December 2011. Out of these 4621 patients (3.64%) tested for sputum microscopy. A total of 844 (18.26% of Pulmonary TB suspect) pulmonary TB patients put on DOTS treatment in the same period. Pulmonary TB patients comprises higher percentage of male (71.80%) than female (28.19%). 588 patients (12.72% of PTB suspect) found as sputum positive Pulmonary Tuberculosis and 256 patients (5.53% of PTB suspect) as sputum negative tuberculosis. The minimum sputum positivity was 11.90% in 2010 to maximum 13.60% in 2011. From 2009 to 2011 total number of PTB cases decreases in contrast number of EPTB increases. EPTB comprises 15.85% of total TB patients put on DOTS treatment and if we calculate year wise then 9.59% in 2009 and 17.59%, 20.75% in 2010, 2011 respectively. Age distribution of TB cases shows that more than 2/3 of Pulmonary TB cases found in 30-60 age group in compare to more than 60% of extra pulmonary TB cases found in 15-30yrs age group. The extra pulmonary Tuberculosis is more common in female in compare to male in almost all age group except in elderly more than 60 years. Case-distribution for both PTB and EPTB with regard to the age as well as the male: female ratio demonstrated respectively similar annual trends from 2009 to 2011. The EPTB mainly concentrated in 16-30years. The commonest site of Extra pulmonary TB is Tubercular lymphadenitis (37.37%) followed by pleural effusion (25.15%), Abdominal Koch (15.09%) and others.

Tubercular lymphadenitis are more frequent in female in contrary tubercular pleural effusion and abdominal Kochs more common in male. Other types of tuberculosis like bone tuberculosis, CNS tuberculosis etc more frequent in female in compare to male patients.

#### IV. DISCUSSION

In the present the study we observe that the percentage of annual case detection has gradually declined for PTB (from 90.40% in 2009 to 79.24% in 2011) and is on rise for EPTB (from 9.59% in 2009 to 20.75% in 2011). Both observations appear to be linked because high cure rate for new smear positive cases with DOTS over last decade is likely to have reduced the TB transmission level in area, thereby, accounting for the decline in percentage of observed annual PTB cases, as well as, the change in EPTB: PTB ratio (from about 1:9 in 2009 to 1: 4 in 2011). This finding was supported by previous study<sup>4</sup>. The present study has shown a rising trend of annual EPTB detection in the area over recent years. This rise is believed to have occurred due to the extensive case management efforts. During same period, with a population growth, the overall number of cases is also expected to rise. HIV could be another contributory factor<sup>5-6</sup>. More studies need to be carried out, in order to determine the trend change of EPTB and the factors responsible for this especially desirable in developing countries, where more TB cases exist and HIV is also on the rise. Demographic characteristics of EPTB cases have shown higher detection in females and in patients of young age. Similar observations have been made in past.<sup>7-8</sup> This study also shows that prevalence of EPTB more common in younger age group with greater affection of females than male (54.71 % vs 45.28% respectively)<sup>9</sup>. In contrast, a higher prevalence of PTB has been observed in elderly than younger patients, with male preponderance of disease (71.80% vs 28.19% respectively)<sup>10</sup>. Most commonly involved EPTB site was lymph node in more than one-third of patient-population followed by the pleural effusion in more than one-fourth of study cases. This finding is in accordance with the epidemiological trend seen in developed countries over past couple of decades, where a rise in tubercular lymphadenitis cases has been noticed after the onset of HIV era<sup>11-12</sup>

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