



Association Of Cervical Lymphadenopathy and Dental Decay Among Extra-Pulmonary Tuberculosis Patients: A Preliminary Descriptive Survey

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Abstract

Tuberculosis (TB) is one of the most prevalent diseases among the developing countries. Extra-pulmonary TB infections (EPTB) remain an unexplored domain in this discipline. One of the common manifestations of EPTB is Cervical Lymphadenopathy (CL). Efficient diagnostic criteria, which could reliably foretell the onset of CL prior hand could enable timely diagnosis of EPTB hence effective therapeutic intervention. Hence this present study assesses the association of CL with Tooth decay and other clinical and demographic factors among the patients (N=25) suspected of EPTB infections. We have observed significant association ($\chi^2 = 7.639$; $p = 0.006$; Fisher's Exact test=0.120) of dental decay with CL. In addition, significant association was observed between the age of the patients with their diabetic status ($\chi^2 = 15.863$; $p=0.001$; Fisher's Exact test=0.001). This investigation sincerely anticipates future studies with larger sample size in this endeavor finding associative markers. Altogether, these results could shed certain light on reliable prognostic criteria in the context of dental health among the EPTB patients.

Keywords

Extra-pulmonary Tuberculosis, Cervical Lymphadenopathy, Dental Decay, Diabetes

INTRODUCTION:

Tuberculosis (TB) is one of the oldest diseases worldwide. It is also the most prevalent disease

among the developing countries. The World Health Organization (WHO) evaluated the mortality estimate of about 1.5 million by the year 2020.

Extrapulmonary tuberculosis (EPTB) is the generic form of infections caused by the *Mycobacterium* species causing clinical debilitations in organs other than lungs. With pulmonary tuberculosis having the prominent spotlight, EPTB infections are largely undervalued necessitating proper clinical and diagnostic standardizations. As of 2013, the TB incidence in India was estimated to be 2.1 million with 16% cases recorded to be EPTB etiology [1]. Certain studies analyzed the intricate mechanisms of EPTB pathogens in harboring the oral and cervical (Collum) regions [2-4]. Oral health and its manifestations were recently reported to be significantly associated with TB [5-6]. Poorer dental health was also reported to be associated with reduced mental health among subjects with HIV infection [7]. Other reports studied oral health status in association with leukemia [8].

One of the primary manifestations of EPTB is Cervical Lymphadenopathy (CL). An interesting study by Dangore SK and Bhake AS, 2018 [9] reported the direct association of dental health with CL. This

present study attempts to investigate the possible association of dental decay with CL patients from South India. We have assessed every demographic and clinical factor in their association with CL.

MATERIAL AND METHODS:

This survey is descriptive by design. We have randomly recruited patients (N=25) visiting OPD Wards of Ashvant Diagnostic Centre, Virudhunagar, Tamilnadu (**Figure 1**) for Tuberculosis treatments. Informed Consent was obtained from all the participants. Demographics and clinical details such as Gender, Age, CL, Dental Decay and Diabetic complications were collected (**Supplementary Table 1**). Presence of CL was confirmed if significant enlargement of lymph nodes is present in cervical region. (**Figure 2**). Geographical Map was constructed using the R software with ggplot2 Package. Data analyses were performed using SPSS software. Chi-Square and Fisher's exact tests were utilized to assess the associations among factors such as CL, Dental Decay, Gender, Age and Diabetic status.

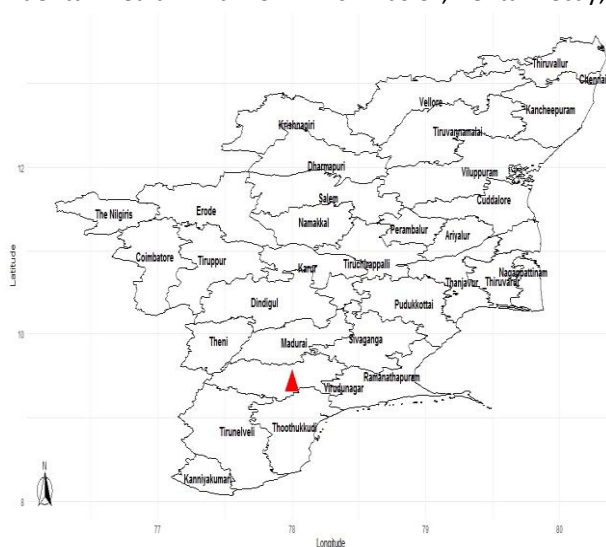


Figure 1. Geographical Map of Sampling Location (marked with ▲ in the district of Tamilnadu, India

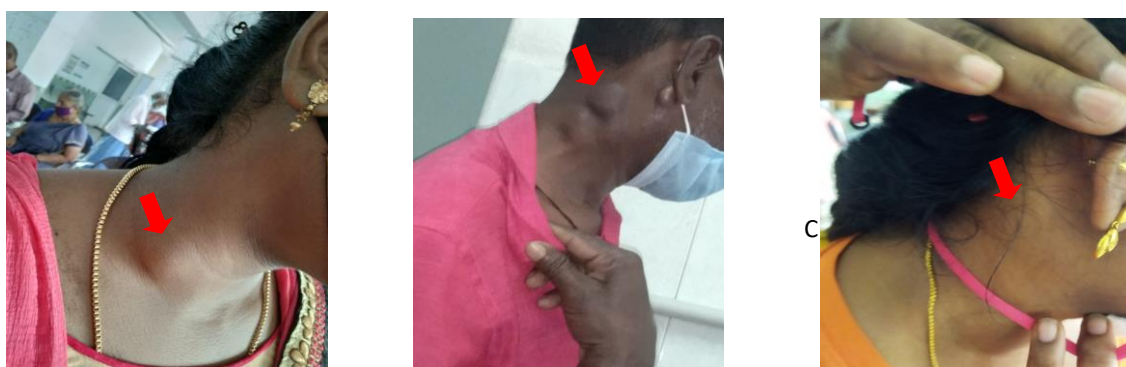


Figure 2: Subjects with lymph node enlargement in Sternocleidomastoid (A) and Cervical (B and C) regions.

RESULT AND DISCUSSION:

Frequencies and percentages (%) for the demographic and clinical factors of the participants were calculated (**Table 1**).

Table 1. Frequencies and Percentages of both the demographic and clinical Factors among the Study Participants

	Frequency	Percentage (%)
Age Group (Percentile)		
1	6	24.0
2	7	28.0
3	6	24.0
4	6	24.0
Gender		
Male	11	44.0
Female	14	56.0
Dental Decay Status		
No	1	4.0
Yes	24	96.0
CL Status		
No	3	12.0
Yes	22	88.0
Diabetic Status		
No	19	76.0
Yes	6	24.0

Percentile Group-based ranking was used to classify the Age groups of the participants. The 2nd Age Group had exhibited highest frequency (7[28%]) among other age groups. The frequency of females is found to be higher (14[56%]) than that of males (11[44%]). Frequency of Individuals with Dental Decay was much higher (24[96%]) than that of those without (1[4%]). Individuals with CL were more frequent

(22[88%]) than those without (3[12%]). In addition, the frequency of individuals with diabetic complications was much lower (6[24%]) than those without any of those complications (19[76%]). The Chi-Square test (**Table 2**) revealed significant association ($\chi^2 = 7.639$; $p = 0.006$) between Dental decay with CL.

Table 2: Association of Demographic and Clinical factors with CL

	χ^2	p-VALUE (χ^2)	p-VALUE (FISHER'S EXACT TEST)
Age group	4.482	0.214	0.276
Gender	2.679	0.102	0.230
Tooth Decay	7.639	0.006	0.120
Diabetes	1.077	0.299	0.554

But the Fisher's exact test did not yield statistically significant association (p value = 0.120) in this regard. In addition, significant association was observed between the age of the patients with their diabetic status using both Chi-Square and Fisher's exact tests ($\chi^2 = 15.863$; $p = 0.001$; Fisher's Exact test = 0.001). Caution must be exercised in this study in evaluating the association of CL with Dental decay as the Fisher's exact test did not yield significant result. Yet this problem could be circumvented using future studies with larger sample sizes. In the light of the report by Caraffa E et al., 2016 [10], which had

assessed the co-epidemic of diabetes along with tuberculosis, we have also attempted to evaluate the possible association of CL with diabetes in this present study. Unfortunately, the association was not found to be significant ($\chi^2 = 1.077$; p -value = 0.299; Fisher's Exact test = 0.554). It was a serendipitous finding that significant association ($\chi^2 = 15.863$; $p = 0.001$; Fisher's Exact test = 0.001) was observed between the Age groups and diabetic status (**Table 3**).

Table 3: Association of Demographic and Clinical factors with Age group.

	χ^2	p-VALUE (χ^2)	p-VALUE (FISHER'S EXACT TEST)
CL	4.482	0.214	0.276
Tooth Decay	3.299	0.348	0.720
Diabetes	15.863	0.001	0.001

But due to the limitation of the smaller sample size we could not make a reliable educated guess in this regard.

CONCLUSION:

Early diagnosis of EPTB infections among patients is mandatory to devise effective therapeutic interventions. This imperative is undertaken by the present study by evaluating the prognostic value of dental decay among EPTB patients. This study nevertheless anticipates forthcoming studies with larger sample size in evaluating effective markers for early EPTB diagnosis.

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CONFLICT OF INTEREST: None.

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