

**A Study to Find Various Sociodemographic Factors in TB COVID-19 Coinfection**Sujatha Tejavat<sup>1</sup>, Krishna Swaroop Duddi Sreehari<sup>2</sup>, Sayed A Quadri<sup>3</sup>,  
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**Abstract:****Introduction:** Tuberculosis (TB) and COVID-19 are infectious diseases, infect lungs. TB is global pandemic and 2<sup>nd</sup> highest number of COVID cases were reported from India. Infection control measures are almost similar for both these infections. With this a study was conducted to find the correlation between the coinfection and various sociodemographic factors from a tertiary health care setup.**Methods:** It was a prospective research conducted in the department of Microbiology, GSL Medical College. Individuals of both gender,  $\geq 18$  years with cough for  $> 2$  weeks and with signs and symptoms of COVID-19 were included. Non cooperative individuals were excluded. The clinical findings and socio demographic factors were recorded in the study proforma. Specimen collection and diagnosis of infections were carried as per the guidelines. The data were analysed using SPSS version 21. Data was presented in mean and percentages.**Results:** During the study period, total 142 members were included, coinfection was diagnosed in 23 (100%) members. The mean age was 36.6 years. Gender wise 13 (57%) were male and 43% (10) were female participants; the male female ratio was 1.3. Age wise, maximum (11; 48%) members were in 21 – 40 years group. As per the income wise most of the coinfection participants were lower income category and all are employees.**Conclusion:** TB COVID-19 coinfection is common among men with low socioeconomic back ground. Hence coinfection screening guidelines are to be followed strictly. Screening of large number of cases for long time is recommended for better outcome.**Keywords:** Infection, study, TB, COVID.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**Tuberculosis (TB) and COVID-19 are infectious diseases, infect lungs. TB is global pandemic, *Mycobacterium tuberculosis* (MTB) is the causative agent. [1] Globally, TB was the commonest cause for death from a single infectious agent. [2] India is 2<sup>nd</sup> highest populated country and highest TB burden country in the world. However due to the proper implementation of TB control programme, there is a drastic raise in the case finding. [2]COVID-19 is one of the severe respiratory viral infections, SARS-CoV-2 is the causative agent. [3] As of March 2021, globally, there were  $> 113$  million confirmed COVID-19 cases and 2.5 million deaths. [4] In terms of COVID-19 infection, 2<sup>nd</sup> highest number of cases were reported from India. [4]Tejavat *et al.*

Infection control measures are almost similar for both these infections. As per the reports both these can complement others pathogenicity and negative impact on the individuals health. Hence government of India released separate guidelines for the diagnosis as well as screening. Multiple reports are available about this coinfection but the data is limited from Indian subcontinent. [2, 3] With this a study was conducted to find the correlation between the coinfection and various sociodemographic factors from a tertiary health care setup.

**Methods**

It was a prospective research conducted in the department of Microbiology, GSL Medical College. Study was conducted from May 2021 to December 2021. Study protocol was approved by the

Institutional Ethics committee. An informed consent was taken from the participants. Individuals of both gender,  $\geq 18$  years with cough for  $> 2$  weeks and with signs and symptoms of COVID 19 infection were included in the research. Non cooperative and unconscious individuals were not considered in the research.

Initially the study protocol was explained to the individuals. Then the clinical findings were recorded in the study proforma. Along with this various socio demographic factors such as monthly income, number of housemates and type of life style were also recorded. Then the participants were explained how to collect good quality of sputum and it was demonstrated practically. [5]

Simultaneously specimen was collected for the diagnosis of COVID-19 infection as per the protocol. [6] Ziehl Neelsen (ZN) staining was used for the diagnosis of TB and RT PCR for COVID-19 infection. [5, 6] The techniques were performed and results were declared as per the guidelines.

#### Statistical Analysis:

The data were analysed using SPSS version 21. Data was presented in mean and percentages. If required Chi-square test was used for statistical analysis and  $P>0.05$  was considered to be statistically significant.

#### Results

During the study period, total 142 members were included in the research. In this 43 were TB positive and 86 were COVID-19 infected. Coinfection was diagnosed in 23 (100%) members. The mean age was 36.6 years. Gender wise 13 (57%) were male and 43% (10) were female participants; the male female ratio was 1.3. Age wise, maximum (11; 48%) members were in 21 – 40 years group. As per the income wise most of the coinfection participants were lower income category and all are employees.

#### Discussion

According to recent studies COVID-19 is responsible for depletion of CD4 T cells which is responsible for conversion of latent TB to active infection; also leads to inflammatory changes to lungs and activates stem cell mediated immunity, negative impact of these infections. [7] Whereas the mice experiments suggest that prior MTB infection can give protection against COVID-19. Moreover the protective effect of BCG had been reported against yellow fever virus [8] and RSV. [9]

In this research the incidence of TB COVID-19 coinfection was 23 (16.2%). The global incidence of this coinfection was reported to be 0.5% to 19%. [10] The mortality of the coinfection was reported to be 11% and the coinfection is responsible 2x mortality compared to MTB infection alone. Whereas in the current research due to the

limitations in the resources the mortality was not considered among the study members.

The mean age of the study members was 36.6 years and maximum number of coinfection was detected in 21 – 40 years group. This is the age group usually involve in the outdoor activity. The mean age was reported to be 39.7 years in another Indian report; the authors reported that preschool and children are at risk. [11] Due to incomplete development of immune system, children are at risk. Less utility of mask is another contributory factor. [12] But in the current research below 18 years were not considered.

Gender wise, the prevalence of the coinfection was more among the male (57%) and the male female ratio was 1.3. The prevalence of the coinfection was reported to be 75% among the men. [13,14] The reasons for high prevalence among the men was reported in the literature. In the current world men and women both are involved in house hold work in which earning is a part. But during the COVID pandemic in majority families, men were involved in outside work for procuring vegetables, glossaries and so on. This could be the reason for high prevalence of the infection among the men.

In the current research, the sociodemographic data of the participants was recorded as per the Modified Kuppuswamy scale and the participants were divided into 5 categories; upper class, upper middle class, middle class, lower middle class and lower class. [15] Highest number of coinfection was detected in lower income group. A meta-analysis report also mentioned that the prevalence is high in low and middle-income countries. [16] In low income population, close living conditions, dense population in the home is common. Hence if one person is infected, within no time the other family members get the infection easily. Hence the prevalence was found to be more in low income community.

#### Conclusion

TB COVID 19 coinfection is common among men with low socioeconomic back ground. Hence coinfection screening guidelines are to be followed strictly. Screening of large number of cases for long time is recommended for better outcome.

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