Original Article

Effect of COVID-19 on Tuberculosis Care in a District of Western Gujarat

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Abstract

Introduction: COVID-19 has had a devastating and disrupting effect on all health-care services across the globe, but tuberculosis (TB) services have been disproportionately affected. Downfall trend of TB notification, diagnosis, and treatment due to the COVID-19 pandemic in our district study was carried out. **Aim:** To assess COVID-19 effects on TB care during 2020-2021. **Methodology:** A cross-sectional study design comprising a secondary analysis of an existing dataset was carried out. Data on the total number of cases notified, diagnosed, and drug susceptibility in drug resistance and sensitivity were collected for 2020 and 2021. **Result:** A statistically significant difference in drug-resistant and drug-sensitive cases was observed during the first and second half of 2020 ($P < 0.001$). In 2021 similar to the earlier wave, there was a decline in case notification during the peak of the pandemic. **Conclusion:** We assessed that during COVID-19, TB care significantly plummeted in our district; however, with the rapid response plan gradually, there was a rise seen in TB notification, diagnosis, and treatment services.

Keywords: COVID-19, indicators, tuberculosis notification

Introduction

Before the COVID-19 pandemic, India was dealing with its old endemic enemy tuberculosis (TB). TB affected 2.64 million people in 2019, leading to the mortality of approximately 450,000 people.[1] This indicates that there had been close to 1000 reported deaths each day. COVID-19 has had a devastating and disrupting effect on all health-care services across the globe, but TB services have been disproportionately affected.[2] India accounts for 27% of all estimated incident cases worldwide.[3] Once TB dropped off the sight of public health and political priority, several gaps will emerge that will cause a huge setbacks to our National TB Elimination Program (NTEP). In particular reduced notification and diagnosis.[4] In our district, first case of COVID-19 was notified on May 13. It was nearly 2 months after the first case detected in Gujarat. Peak cases were maximally recorded during August 2020.[5] Our district study carried out a downward trend of TB notification, diagnosis, and treatment due to COVID-19 pandemic.

Aim

To assess COVID-19 effects on TB care during 2020-2021.

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Objectives

1. To compare various indicators of TB care during the first and second half of 2020
2. To assess the achievement in Tb notification cases against the proposed target in 2021.

Methodology

Study design

A cross-sectional study design comprising a secondary analysis of an existing dataset was carried out. The secondary analysis involves re-using qualitative data from preexisting data available. Data were provided from the district TB center of the Amreli. It has 11 TU (TB unit) and 59 PHI

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(Peripheral Health Institutes). The district TB center collects the data from all their TU and PHI.

Data set

Data regarding a total number of cases notified, diagnosed, and drug susceptibility in the form of drug resistance and sensitivity were collected for 2020 and 2021.

Ethical approval

Ethical permission was taken from the ethical committee of the institute.

Statistical analysis

The richness of the provided data helped in whether the decrease in indicators of TB is statistically significant or not. The collected data were entered and analyzed in MS office Excel version 2010. Quantitative data were expressed as mean and standard deviation *t*-test was used to check the statistical association and significance. The statistical significance level is set at $P < 0.05$ (two-sided). The program data were analyzed to identify significant differences between before and after COVID-19 pandemic.

Results

This study compared data for the first 6 months of 2020 with the latter. In our district, cases of COVID-19 started rising in May 2020 and peaked in August. In October 2020, cases gradually declined. During the second wave, peak cases were observed in April 2021.

Table 1 shows a decrease in a mean number of cases notification in both the private and public sectors during July-December 2020. This difference was found statistically highly significant ($P < 0.001$). The statistically significant differences in drug-resistant and sensitive cases were observed during the first and second half of 2020 ($P < 0.001$) [Table 2]. A comparison of the mean number of sputum examinations and cartridge based nucleic acid amplification test (CBNAAT) in Table 3 shows a marked reduction. No statistically significant difference was observed in the number of sputum examination. A highly statistically significant association ($P < 0.001$) was found in CBNAAT examination.

In 2021 similar to the earlier wave, there was a decline in case notification during the peak of the pandemic. Figure 1 shows the proposed target cases (green dash line) to be achieved and the actual number of cases (green and blue bar) that were notified during that year. A similar pattern was also reported in the sputum examination and CBNAAT. The number of sputum examinations and CBNAAT performed during 2021 is shown in Figure 2. It shows that during the peak of the second wave, there was a decline in sputum examination and CBNAAT.

Discussion

Given the global TB epidemic, COVID-19 had imposed a great risk in the recent success of controlling the global TB epidemic. According to the WHO report,[1] in 2020, only 1.4 million people got TB care. In 2020, globally, 84 countries notified 4.9 million provisional cases compared with 6.3 million notified for 2019. The group of 10 high-burden countries (including India) displayed the largest downfall in TB notification compared with 2019, which was around 28%.[6]

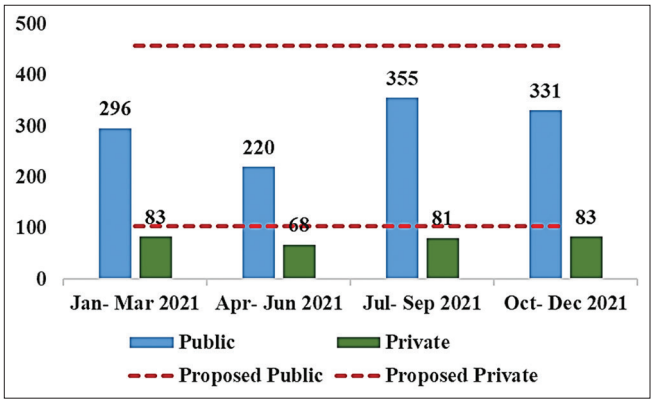

Figure 1: Notified cases of TB against its proposed target during year 2021. TB: Tuberculosis

Table 1: Distribution of case notification in first and second half of 2020

Case notification indicators	Mean±SD		*t*-test	*P*
	January-June 2020	July-December 2020		
Cases from public	256±21	212.50±19.5	3.72	0.003987
Cases from private	106.5±11.5	67.50±7.5	6.96	0.00003909
Total	362.5±32.5	280.00±27	4.78	0.0007426

SD: Standard deviation

Table 2: Distribution of cases according to their drug sensitivity in first and second half of 2020

Drug susceptibility indicators	Mean±SD		*t*-test	*P*
	January-June 2020	July-December 2020		
Drug sensitive cases	377.5±6.5	310.00±20	7.86	0.00001371
Drug-resistant cases	10.5±2.5	7.00±1	3.18	0.009753

SD: Standard deviation

Table 3: Distribution of cases according to diagnosis in first and second half of 2020

Diagnostic indicators	Mean±SD		*t*-test	*P*
	January-June 2020	July-December 2020		
Sputum examination	4393.5±1286.5	3854.00±444	0.97	0.3544
CBNAAT	315±45	183.50±33.5	5.74	0.0001873

SD: Standard deviation, CBNAAT: Cartridge based nucleic acid amplification test

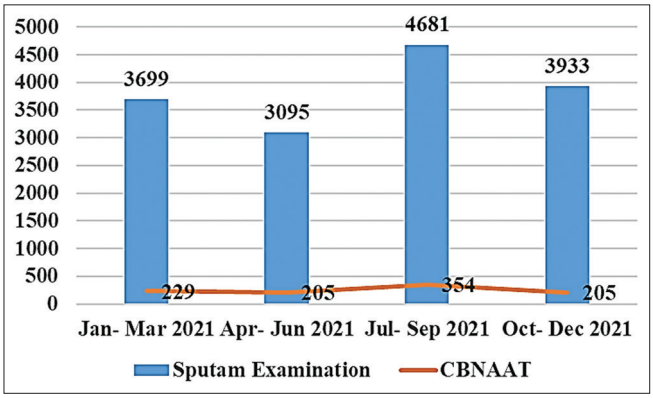

Figure 2: Number of Sputum examination and CBNAAT performed during 2021. CBNAAT: Cartridge based nucleic acid amplification test

With emerging new COVID-19-affected patients, a nationwide lockdown was laid down from March 25, 2020. In April 2020, monthly data of TB notification declined below 84,000.[4] Notification rates after that did improve for some months but comparing previous years they remained low. Unfortunately, India experienced the second wave from April to June 2021, which was more destructive than the first wave. Then again, India laid down a very tight lockdown. At that time, TB notification fell to around 92,000 cases[6] in May 2021.

Similar to that in our study, there was a decrease in a mean number of cases' notification in both the private and public sectors during July-December 2020. This difference was found statistically highly significant ($P < 0.001$). A study from South Korea[7] also showed TB notification was reduced by 24% before and after beginning of COVID-19 pandemic. Malawi, a country located in East Africa which is also 1 of 30 countries having a high burden of TB and HIV, showed a 23.7% (95% confidence interval [CI]: 21.4%–26.0%) reduction in TB notifications from April 2020 to December 2020.[8] In Egypt, Hashem *et al*.[9] showed a 41.6% ($P < 0.001$) decline in the diagnosed cases of TB in the second quarter of 2020. Owing to the nationwide lockdown, there was panic, difficult transportation, scarcity of food (for poor and vulnerable people), fear, and incorrect information about COVID-19. All of these directly or indirectly led to a reduction in TB notification and diagnosis.

Vadgama *et al*.[10] showed a decline in the actual number of patients screened through sputum smear by 2.4 times, compared to 5 months before (November 2019 to March 2020) and after (April 2020 to August 2020) lockdown.

In a study from China,[11] 2020, the percentage of sputum examination for TB decreased from 68.8% in the control period (11 weeks before January 24, 2020) to 60.2% in the intensive period (11 week from January 25, 2020 to April 8, 2020).

Our study found reduction in CBNAAT examination (for presumptive multidrug-resistant TB diagnosis), which showed highly significant association ($P < 0.001$). It was similar to the study done by Vadgama *et al*.[10] The statistically significant differences in drug-resistant cases and drug sensitive cases observed during the first and second half of the year.

A large survey was done by groups of over 10 civil societies and global networks to show disruption done by COVID-19 pandemic on services and stakeholders of TB. The result of that survey was released on September 15, 2019. In which, 62% of patients who were on anti-TB drugs refused to visit for regular checkup for fear of getting COVID-19. Among health-care workers 80% agreed that number of patients coming for TB testing has been reduced significantly.[12]

On March 22, 2021, the WHO outlined some key actions to combat TB during COVID-19. It included effective infection control measures for patients, staff, and health-care workers for their health safety. Considering the same complaints of breathlessness, cough and fever combined testing for COVID-19 and TB was proposed. Promote access to people-cantered prevention and care services. Build and strengthen youth, community, and civil societies.[13]

A rapid response plan was formulated in September 2020 by NTEP to combat COVID-19 pandemic and its effect on TB epidemic.[14] The plan had its salient features like bidirectional screening of COVID-19 and TB, aggressive case finding, rapid molecular testing instead of sputum examination, and delivering TB medicine directly to patients' houses. With these mitigation measures like utilizing digital techniques for compliance, call center for help and assigning family members as DOTS providers for adherence and catchup campaigns by December 2020, the NTEP enrolled 1,805,670 patients notified, 11% more than projection made in April 2020.[15]

Nath *et al*.[16] showed "V-shaped recovery" in TB notification with sudden increase in notification after June 2021 (completion of second COVID-19 wave), which was seen after bidirectional screening of COVID-19 and TB. The rise of cases fall down from July to August 2021 indicated delayed notification of TB during pandemic and missed cases diagnosed later after decline of COVID-19 cases.

India has national strategic plan 2017–2025 and has proposed bold strategies to rapidly decline TB incidence and mortality

in India by 2025, 5 years ahead of the global end TB targets and Sustainable Development Goals to attain the vision of a TB-free India.[17] To achieve this target, prompt and accurate TB notification, diagnosis, and treatment initiation are necessary.

Few limitations of the present study are that it is limited to only one district and we have not analyzed the outcome indicators.

Recommendation

Through this study, we recommend that government should prepare for future pandemics that may affect TB care. In past during Ebola outbreak in Guniea[18] from 2014-2016, major disruption in TB notification and control was observed. Learning from such past experience, we recommend to remain proactive and vigilant for TB services during epidemic and pandemic in future. We suggest the formation and utilization of state epidemiological intelligent unit[19] for forecasting epidemics and pandemics and giving lead time to prepare for same.

Conclusion

In our study, we assessed that during COVID-19, TB care significantly plummeted in our district; however, with the rapid response plan, gradually, there was a rise seen in TB notification, diagnosis, and treatment services.

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Conflicts of interest

There are no conflicts of interest.

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