Impact of Covid 19 Pandemic on Tuerculosis

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Abstract

Summary: Covid19 is the most dreaded pandemic of the century causing wide spread and on the other hand Tuberculosis is an age old disease killing billions. Tuberculosis is an air borne infection while Covid spreads via droplet spread and through fomite as well. Tuberculosis and complications related to it may lead to increased mortality due to poor lung compliance. Moreover Tuberculosis control programmed may get affected due to the ongoing pandemic. To decrease the adverse outcome of Covid19 on Tb strict measures like proper social distancing, hand hygiene, compliance to Anti Tubercular drugs, domiciliary Tb care and strengthening immune system may prove important.

Keywords: *Covid19, Tuberculosis, Pandemic, fomite, Social distancing.*

Introduction

The novel coronavirus-19 (nCoV-19) also known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a new coronavirus recently discovered in 2019. The disease has expanded to more than 150 countries with around 45 lack cases and more than 3 lack deaths around the globe.(1)

According to WHO, "TB is a worldwide pandemic. TB has killed around 1 billion people between 1800 and 2000. It attacks the human body more slowly than viral diseases like flu or COVID-19. It kills around 4000 thousand people every day in under developed and developing countries."

In this article we would like to discuss the possible impact of Tuberculosis during the Covid 19 pandemic and vice a versa and an observation on what Measures are being taken by a Rural Hospital in Central India for Control of Covid19 and Tuberculosis.

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Pathogenesis of Covid19: Virus Structure: Coronavirus virus has a simple structure, it is a round and pleiomorphic, 80 to 120 nm in diameter in size.(2) It is club-shape with spike projections emanating from the surface.Nucleocapsid is in the envelope containing positive-strand RNA. There are four main structural proteins in coronavirus particles. These are the spike (S), membrane (M), envelope (E), and nucleocapsid (N) proteins.(3) Spike protein with ACEII receptors helps in adhesion to the target cell.

COVID-19 infection induces IgG antibodies against N protein that can be detected by serum as early as day 4 after the onset of disease and with most patients seroconverting by day 14. Laboratory evidence of clinical patients showed that a specific T-cell response against SARS-CoV-2 is important for the recognition and killing of infected cells, particularly in the lungs of infected individuals.(4) T cell response is also seen in patients of Tuberculosis.(5) BCG vaccine (vaccine given to prevent complication of Tb) is predicted to protect from Covid infection. This could be because of "off target effects" of and increases the ability of immune system to fight infections other than Tb. Though further studies are being done to prove such claims. The virus binds to carbohydrates and hinds behind it (Carbohydrate Camouflage) makes it difficult for body's immune system to detect it. Moreover it has a very high secondary attack rate compared to SARS (SARS Cov 1) and MERS, which makes it more fatal.

Spread of Covid 19: Covid spreads via droplet infection when a person is in in close contact (within 1 meter) with patient having respiratory symptoms (e.g., coughing or sneezing) and the respiratory droplets can infect the exposed mucosae (mouth and nose) or conjunctiva (eyes). Transmission also occur through fomites. The virus can spread by direct contact with infected people and indirect contact with surfaces and objects[1]. Transplacental and feco-oral spread are also reported.

Spread of Tuberculosis: Airborne spread from one person to another. The TB bacteria are suspended in the air when a person with TB coughs. People nearby may breathe in these bacteria and become infected.[6] Unlike Covid19 TB is NOT spread by shaking hand, touching bed linens or toilet seats. Reactivation is common in Tb which has not been reported in Covid19.

Comorbidities, like hypertension, diabetes and coronary heart disease, have shown poor outcomes.[7] It is not clear whether having underlying lung disease like TB, will increase the severity of COVID-19. Both COVID-19 and TB cause respiratory symptoms – cough, fever and shortness of breath. One of the biggest differences is the progression of onset of symptoms. TB symptoms do notoccur immediately, butdevelop over a period of weeks, unlike COVID-19, where symptoms can occur within a few days.

Possible Impact on Tuberculosis in Covid19 Pandemic: The majority of TB hospitals in China have been converted to COVID-19 hospitals because of their roles in communicable disease. Likewise India could face a similar problem of lack of staff for management of Tb as most of the Pulmonary Physicians, technician and other staff are shifted towards Covid19 management and screening. Due to lockdown the patients might not be able to visit hospitals for treatment or follow up. This might lead to delay in diagnosis and initiation of treatment. Lack of availability of Anti Tubercular drugs due to lock down. Active Tb cases might be at increased risk for Covid19 due to poor lung functions, or patient of Tb with HIV the severity and mortality of Covid might be higher. Covid patient might develop Tb due to reactivation due to temporary weakened immune system due to Covid or corticosteroid therapy, few such cases were reported during the SARS outbreak. Patients with post tubercular complications like destroyed lung, bronchiectasis, and extensive fibrosis might also show increased complications and higher mortality due to poor lung compliance. This may lead to poor outcome and increased overall mortality in the ongoing Pandemic. If the situations arises in a country of high Tb prevalence like ours where the Covid cases goes very high, then the Tb patients might not get ventilators or ICU support due to poor outcome of these patients.

These conditions may lead to increased neglect of the tubercular patients moreover the relative/caretaker of Tb patients are at higher risk for Covid19 due to frequent hospital visit.

Due to Covid19 pandemic the Tb eradication program might take a hit back. There can be chances of increase in Tb spread during or after the Covid pandemic. Due to above reasons WHO on 20th March 2020 has stated- "COVID-19: Considerations for tuberculosis (TB) care services-As the world comes together to tackle the COVID-19 pandemic, it is important to ensure that essential services and operations for dealing with long-standing health problems continue to protect the lives of people with TB and other diseases or health conditions. Health services, including national programmes to combat TB, need to be actively engaged in ensuring an effective and rapid response to COVID-19 while ensuring that TB services are maintained".

Measures to be taken by people with TB to reduce their risk for COVID-19: Social distancing with "reverse-quarantine": Remain at home and avoid contact with people as much as possible. Wash hands frequently with soap and water. Avoid touching face, nose, eyes with unwashed hands. Avoid close contact with those who are unwell. Strictly adhere to your TB treatment. Avoid hospital visits as much as possible and keep in touch with your doctor/nurse/health facility by phone. Strengthening of the domiciliary care for Tb should be done. Admissions of Tb patients and management of complications should be done as per protocol. Use masks, and take extra caution to maintain hygiene such as - disinfection of hands, used surfaces, proper disposal of used tissues, etc.

Measures taken in a Hospital in Central Rural India to fight Covid19 and Tuberculosis: Measures taken to control Covid19: A separate section of the Hospital has been assigned where suspected patients are admitted. The block consist of a separate ICU with ventilators, separate ward with designated rooms for dawning and dwarfing of PPE (Personal Protective Equipment) and designated staff. The entry and exit

of the block is kept separate from the Hospital's entry. Personal Protective Equipments including N-95 mask, gowns, helmets etc is being provided to the staff present in the block. Patients who falls under following criteria- 1. All asymptomatic patients with history of foreign travel 2. All contacts of laboratory confirmed cases 3. Health care workers managing respiratory distress/ Severe Acute Respiratory Illness should if they become symptomatic 4. All Hospitalized patients with Severe Acute Respiratory Illness or previously hospitalized patients showing signs of atypical pneumonia and 5. Patients with flu like symptoms arriving from districts where cases of Covid19 are reported. Those patient's are being admitted and oropharyngeal and nasal swabs are been send for testing.

For the screening purpose a separate OPD(Out Patient Department/Unit) has been set up, all the patients as well the at tenders visiting the hospital are being screened before entering the wards and OPDs and their temperature is being measured by infrared (gun) thermometers. All the suspects are advised either home quarantine or hospital admission accordingly. Multiple hand washing units with washbasins and soaps have been set up and hand washing is mandatory for everyone entering the Hospital premises. The use of masks and hand hygiene is being promoted extensively. Assemblage of people is being discouraged. Limited number of people are being allowed to enter the hospital. Barricading has being done to avoid gathering of people. A separate screening unit has been set up in front of the Emergency (casualty) department for proper screening triage and management of the patients.

Measures taken to control Tuberculosis: Tuberculosis treatment and management of complications due to tuberculosis is practiced according to the RNTCP (Revised National Tuberculosis Control Programme) according to Government of India guidelines. Patients of Tuberculosis are being admitted in the TB Isolation ward with designated staff. Gloves and masks has been provided to the staff. Patients of Multi Drug Resistant tuberculosis and tubercular patients with comorbidities like Diabetes Mellitus, Hypertension etc. are given special attention and nutritional care. The visit of attendants and relatives have been restricted or allowed for limited time with due permission. The supply of Anti Tubercular Drugs is being maintained. Hospital's DMC (Designated Microscopy Center) Laboratory is kept functional for diagnosis and management of Tuberculosis patients. Domiciliary Tuberculosis treatment is being encouraged. Those patients which are unable to visit hospital due to lockdown or restricted transportations are being closely monitored and managed telephonically. The use of mask and repeated hand washing with soap or alcohol based sanitizers is advocated to the patients and the relatives.

On the contrary we have seen a sharp fall in Tb cases in our hospital in last 2.5 months. The number of Tb have fallen less than half in month of March and April. The possible reasons could be – As the Covid19 cases spread from China to other parts of the world in later half of February and March, it made big news on media and social media and other platforms as well. This lead to the people becoming more aware regarding the coughing and hand hygiene. Practices like splitting/coughing in the public have reduced significantly. Social Distancing could play a major factor in decreasing the spread of Tb. Pan India lockdown might also have played a major role in breaking the chain of Tb transmission. Lack of transport could also be a reason. But to prove this extensive research needs to be undertaken on this with more data collection. Anything to comment regarding this would be too early.

Conclusion

Both Covid-19 and Tb are global pandemics, while one is a newer disease the other is centuries old. Both disease spread can be halted by proper cough hygiene, hand wash and proper isolation. Breaking the chain of transmission is important to stop the spread of both the diseases. Mortality related to Covid19 in Tuberculosis may be more as compared to normal individual. Domiciliary care in Tb may prove beneficial in management of Tuberculosis. Strengthened immune system and absence of co-morbid conditions like diabetes, hypertension leads to lesser complications and mortality. The factors like social distancing, hand hygiene,cough hygiene etc. which break the chain of transmission for Covid19, those factors might as well reduce Tuberculosis in the country but this needs further research and time.

Ethical Clearance: Taken from institutional ethics committee.

Source of Funding: Self.

Conflict of Interest: Nil.

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