Effective use of telemedicine in Mumbai with a cohort of extensively drug-resistant “XDR” tuberculosis patients on bedaquiline during COVID-19 pandemic

India has the largest number of drug-resistant tuberculosis (DR-TB) patients in the world, with almost 150,000 new cases detected annually. Its management is challenging as it involves prolonged treatment with potentially toxic drugs. This warrants close monitoring to ensure minimization of risk to patients during treatment.

The recent COVID-19 pandemic has the potential to undermine our efforts to overcome this disease and can influence the outcomes of treatment. Therefore, health-care providers need to adapt and find novel means of helping patients.

A nationwide lockdown was instituted in India on March 24, 2020. Since then, we proactively replaced our system of having patients with extensively drug-resistant TB visit clinic with telemedicine services.

The collaborative effort of P.D. Hinduja Hospital, Mumbai, and RNTCP ensures that patients in private sector access bedaquiline (BDQ). So far, 30 patients have been enrolled and are being closely monitored. These patients formed the cohort being studied and online consultations (via Skype, Zoom, and WhatsApp) were done where a list of symptoms and directions were discussed [Table 1].

Patients were also recommended blood tests, audiometry, electrocardiogram (ECG), and other tests consistent with the guidelines. Patients were encouraged to conduct tests at the nearest laboratory and share results electronically. Healthy family members were prompted to collect patients’ monthly quota of BDQ and other TB drugs from our center, in order to minimize the exposure of COVID-19 to patients. For ease of travel, they were provided with both new prescriptions and letters requesting passage to facilitate travel. A follow-up call was done ensuring patient received all the TB drugs.

A questionnaire was administered to each patient to determine the main challenges encountered during the lockdown and to assess the acceptability of telemedicine. We surveyed the results and compiled their feedback regarding the current situation of COVID-19, including its effect on their ongoing TB treatment.

Of the 30 patients in our cohort, 28 contributed to the results of our questionnaire. 78% of patients reported that they were experiencing considerable problems during the lockdown [Figure 1].

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### Table 1: Structure of each patient’s telemedicine consults

| Topic                        | Details discussed via telemedicine | Advice given                                      |
|------------------------------|-----------------------------------|--------------------------------------------------|
| Current symptoms             | Cough, fever, pleuritic chest pain, etc. | Patients are motivated to continue and follow their treatment rigorously. |
| New complaints               | Any new symptom                   | Evaluated and effective solutions suggested.     |
| Adverse drug reaction        | Peripheral neuropathy, jaundice, depressive symptom | Prescription changes made to counter adverse drug reaction(s) and emailed to patients. |
| Drug adherence               | TB treatment card analyzed via images shared on WhatsApp or e-mail for irregularities which was filled by family members. Reason for poor compliance was analyzed and discussed. | Family members were encouraged to take the role of supervision. |
| Directions to take BDQ       | Specific queries regarding.       | Schedule and side effects explained.             |
| Concurrent COVID-19 symptoms | New onset of upper respiratory tract infection symptoms was inquired. | COVID-19 PCR testing for suspected symptom.       |

BDQ: Bedaquiline, ECGs: Electrocardiograms, PCR: Polymerase chain reaction, TB: Tuberculosis

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the lockdown in terms of drug collection. 64% of patients reported difficulties in finding a laboratory to perform ECG and other tests. 21% of patients reported difficulties related to transportation, and 7% of patients reported issues regarding the administration of injectable [Figure 1].

After 2 months of telemedicine, 68% of patients preferred the convenience of telemedicine to direct contact. Only 27% of patients preferred the previous system of direct interaction with a physician, while 5% of patients had no specific preference.

The most striking fear among patients was of losing access to BDQ, which could lead them to develop resistance to the drug.

Our findings suggest that it is possible to reach out with teleconsultation to our patients and effectively guide them through their symptoms, drug side effects, monitor results, and ECG, and arrange for them to receive prescriptions without interruption. While inexpensive and expedient, telemedicine may risk compromising the quality of care associated with a physical examination; however, in times of COVID 19, this is a trade-off we may have to accept.[3]

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Conflicts of interest
There are no conflicts of interest.

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