Research article

How to improve TB outpatient service in a TB low-endemic country during SARS-CoV-2 pandemic

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Keywords

Tuberculosis • Outpatient care • Italy • TB-care • Medical ethics

Summary

Despite notable progresses in the recent decades, tuberculosis (TB) continues to remain a public health concern even in Europe. TB prevention and care should be people-centred, improving ambulatory models across countries, in order to expand access to diagnosis and treatment for both TB infection and disease. Even more, during emergencies such as the current pandemic, when seeking of TB care has been replaced by the fear of coronavirus disease 2019 (COVID-19), TB patient's care is fundamental. In this short communication, we document how was possible to implement a TB outpatient service meanwhile a local outbreak of SARS-CoV-2 transmission was ongoing.

Despite notable progress in the recent decades [1, 2], tuberculosis (TB) remains a public health concern in the World Health Organization (WHO) European Region, which includes Italy, currently being the leading cause of death from a single microorganism [3, 5].

The emergence of drug-resistant (DR)-TB in TB low-endemic countries is a consequence of failings in the health care system that does not provide easy access to TB care to those in need, fuelling the TB epidemic and slowing the progress to TB elimination [6, 7].

A milestone of TB prevention and care is a people-centred approach, which implies overall improving ambulatory models across countries, in order to expand access to diagnosis and treatment of both TB infection and disease [6]. In fact, hospitalization of TB patients is needed only for case of severe localizations (e.g. TB meningitis, TB pericarditis) and/or when complications arise because of the treatment (e.g. severe allergies) and/or if the patient has comorbidities that require close monitoring during anti-TB and TB preventive treatment (TPT) [8].

Otherwise, independently from the spectrum of resistance of the *Mycobacterium tuberculosis* (Mtb) strain, all TB continuum of care, from screening and diagnosis to treatment and post-treatment follow-up, should be carried on in specialized outpatient services [8]. Even more during pandemic times, where seeking of TB care has been replaced by the fear of coronavirus disease 2019 (COVID-19) and outpatients services have been hampered by the health emergency status, TB patients care is fundamental [9, 10].

Aim of this paper is to describe how a TB outpatient service was implemented in a referral centre for Infectious and Tropical diseases in Northern Italy when the COVID-19 pandemic was raging in the area.

Following the example of the Regional TB Reference Centre of Lombardy Region, Villa Marelli Institute/ASST Niguarda Ca' Granda (Milan, Italy), which works as an outpatient reference centre for drug-susceptible and DR-TB, serving a population of > 10 million people and managing ~250 patients per year (3% with DR-TB) [7], we created, at the IRCCS Sacro Cuore Don Calabria Hospital (Negrar di Valpolicella, Italy), an integrated outpatient TB service with a multidisciplinary team composed by infectious disease specialists, pulmonologists, pharmacists, microbiologists, radiologists, gastroenterologists, and geriatrics.

Moreover, *on demand* cultural mediators allow to further improve the service, guaranteeing the patient's full understanding of the disease, treatment, scheduled follow-ups visits as well our full understanding of the patient's complaints. In case of other organ involvement (e.g. genitourinary tract) other specialists were called on demand for consultations.

The outpatient TB service was based on the following major pillars against the most common barriers:

1. easy and direct access for patients (reducing barriers to access);
2. rapid molecular diagnosis and drug-resistance profiling (reducing risk of suboptimal treatment or resistance induction and optimizing treatment duration);

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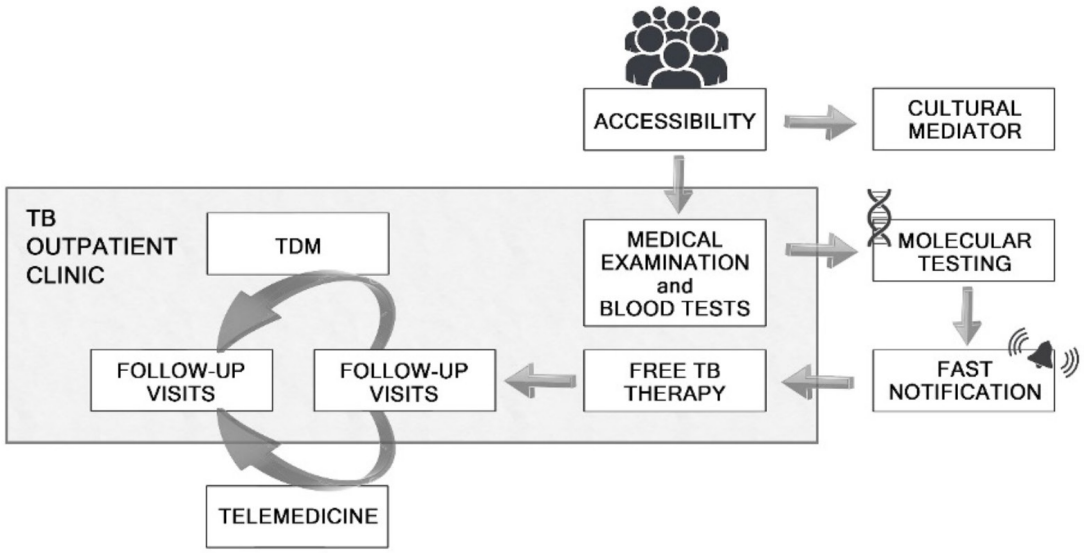
Fig. 1. TB outpatient service workflow at IRCCS Sacro Cuore Don Calabria Hospital.



3. instant notification of molecular and microbiological tests' results to the treating physicians (timely adjustment of treatment);
4. tailored treatment regimens mindful of patients' co-morbidities and at-risk behaviours (like unhealthy diet, comorbidities, drug-drug interactions etc.);
5. direct distribution of anti-TB drugs to the patient (delivered to patients at time of visit, in order to increase adherence to treatment);
6. consultation vie e-mails with patients between follow-ups (essential during COVID-19 lock-down period);
7. scheduled follow-up visits with the possibility of convenient specialists' consultation (to give comprehensive care to patients);
8. therapeutic drug-monitoring of anti-TB drugs (increasing adjustment of treatment and tolerance) [11];
9. track patients' adherence using electronic tools to reduce dropouts (increasing compliance);
10. infectious (e.g. hepatitis B virus, hepatitis C virus, HIV, aspergillosis) and tropical (e.g. schistosomiasis, strongyloidiasis) diseases screening for patients from endemic areas;
11. discussion of difficult-to-treat cases with experts from the Villa Marelli Institute (Fig. 1).

Applying the model to the current context of the COVID-19 ongoing pandemic, we established to screen all patients with rapid antigen test for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) before entering the hospital and, if the results are either positive or pending, adequate personal protective equipment is worn by both patients and health care workers.

Since the beginning of the outpatient service in July 2020, 30 tuberculosis cases have been diagnosed, 28 (93,3%) and 2 (6,7%), DS and DR-TB, respectively.

Twenty-three were diagnosed pulmonary TB and 7 extra-pulmonary TB. Overall, 6 patients were born in Italy and 24 were foreigners. Just one patient (3.3%) was lost to follow-up.

In conclusion, starting from a people-centred approach, our outpatient service for TB patients care was organized to be nearer and more accessible to the people who need it the most [12].

Overall, it points to a model easily replicable in other low-endemic-high income countries in order to increase patient's adherence to treatment and to answer to patients' necessities [5, 13].

Furthermore, hospitalization can be restricted only to those with severe disease, with reduction of isolation stay and related costs; leaving hospital-bed free for other infective-pathologies such as the current numerous cases of COVID-19 pneumonias [5].

Finally, our contribution represents a step forward in building up extended regional and national networks for TB outpatients. Ensuring quality care, sharing information on diagnosis, management and outcomes, and addressing social and cultural aspects by employing professional mediators may help to increase treatment success, reduce drop out and, ultimately, contribute to the WHO goal of ending global TB epidemic by the year 2035 [14].

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Conflict of interest statement

The authors declare no conflict of interest.

Authors' contributions

NR, AA and GB conceived the study; NR, PR, SD, SV, MM drafted the manuscript; NR, PR, LRA, PC, MF, MM, TZ, RT, CC, LC revised the manuscript; NR, PR, SD, SV, PC, MF, MM performed a search of the literature; NR, PR, SD, MM, LC, GB and AA revised critically the manuscript. All authors read and approved the last version of the manuscript.

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