Recommendations for laboratory diagnosis of TB during the COVID-19 pandemic

Given the current situation of the COVID-19 pandemic, countries are advised to continue adopting the TB diagnostic algorithms recommended by PAHO / WHO[1].

Despite the differences in the modes of transmission of TB and COVID-19, certain personal protection measures are relevant for both diseases. Routine measures to protect yourself from TB should continue[2] along with additional precautions to protect workers from COVID-19[3].

The samples and diagnostic methods for TB and COVID-19 are different. For TB, the sample of choice is sputum, and diagnostic methods are based on rapid tests, culture, and DST. On the other hand, the samples for molecular diagnosis of COVID-19 (Real-Time PCR) are nasopharyngeal swabs or nasal lavage/aspiration. Facilities that diagnose TB may receive samples from people who may be infected with COVID-19, many of them undiagnosed. Therefore, TB laboratory personnel may be at increased risk of COVID-19 infection and these risks should be minimized. WHO advises all laboratory personnel involved in COVID-19 testing to follow good microbiological laboratory practices when performing laboratory procedures[3] (frequent hand washing and the use of hand sanitizers, especially after handling biological samples).

TB laboratory networks in countries that have incorporated GeneXpert® technology in recent years should take advantage of the response to COVID-19. The arrival of the Xpert® Xpress SARS-CoV-2[4] cartridge on the market is expected to increase demand, in TB diagnostic centers with GeneXpert® machines, to analyze COVID-19 samples. In this context, the diagnosis of TB could be affected since both diseases would use the same platform. Adopting measures that allow the two diagnostic tests to be carried out on the same machine, assigning different schedules, reinforcement of personnel and incorporating other work shifts, could increase the productivity of the GeneXpert ® and ensure the continuity of TB diagnosis.

As per the above-mentioned statements, the following protection measures, for TB laboratory personnel, are recommended:

- Sputum should be collected in an open, well-ventilated space, and health personnel should stand more than two meters away from the person during collection.
- Strengthen and Maintain the use of biosafety measures and personal protective equipment (PPE) during sample collection, transport (use of triple packaging) and handling.
- Each TB laboratory must carry out a risk assessment according to the diagnostic methods it performs[2].
- Handling of sputum and any infectious specimens should be performed in a Class II Biological Safety Cabinet (BSC), during the COVID-19 pandemic. In addition, any laboratory procedures with the potential to generate fine particle aerosols (for example, during open tube sample preparation or vortex agitation) should also be performed in a BSC. It is recommended that sample preparation to perform the rapid molecular methods (Xpert MTB / Rif (Ultra), LPA), cultures, and DST be performed in a BSC.

- Any in-laboratory procedure that generates aerosols and is performed outside of a BSC (or clean-up of highly suspicious samples, for example) must be performed using N95 mask.
- For peripheral or local laboratories that don't have a BSC and perform smear microscopy, compliance with the use of PPE and the following biosafety measures are recommended:
- consistent use of the N95 respirator
- handwashing
- use of gloves
- goggles or protection shield
- waterproof aprons
- gas burner
- regular decontamination of surfaces
- staff distancing in the laboratories
- ventilated workplaces
- safe transportation of samples
- After samples are processed, work surfaces and equipment used should be decontaminated with appropriate disinfectants (e.g. hypochlorite, alcohol, quaternary ammonium compounds, and phenolic compounds) and for the recommended contact time, at the correct dilution and within the expiration date after the disinfectant working solution is prepared.
- All disposable material must be autoclaved before final disposal.

References:

1. Algorithms for the diagnosis of Tuberculosis
   https://www.paho.org/en/documents/algorithms-diagnosis-tuberculosis-2018

2. WHO Tuberculosis laboratory biosafety, 2012
   https://www.who.int/tb/publications/2012/tb_biosafety/en

3. Interim laboratory biosafety guidelines for the handling and transport of samples associated with the novel coronavirus 2019 (2019-nCoV)1
   https://www.paho.org/en/documents/interim-laboratory-biosafety-guidelines-handling-and-transport-samples-associated-novel

4. Xpert® Xpress SARS-CoV-2
   https://www.fda.gov/media/136314/download

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