Commentary
Volume 12:5, 2022

Journal of
Pulmonary & Respiratory Medicine

ISSN: 2161-105X

Open Access

Commentary on the Clinical Diagnosis of Smear-Positive Pulmonary Tuberculosis

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Description

The detection of certain DNA sequences or the direct detection of Mycobacterium tuberculosis complex strains after isolation, culture, and identification are still required for a positive diagnosis of pulmonary tuberculosis. To streamline and standardise clinical and laboratory processes, a "tuberculosis kit" can be used to collect respiratory tract and stool samples, which are clinical specimens for the direct diagnosis. Other samples, such as gastric juice, are no longer useful. In 10 days, tuberculous mycobacteria can be isolated thanks to the combination of improved cleaning techniques and new liquid and solid Middlebrook blood-enriched culture media. Thin layer agar assays and microscopic inspection drug susceptibility testing enable quick identification of M. tuberculosis, including treatment-resistant tuberculosis. Ziehl-positive samples can be used to detect tuberculous mycobacteria using "closed molecular tests," which can also be used to identify rifampicin resistance in three hours. With mass spectrometric protein spectrum analysis, quick identification is possible. Last but not least, genotyping by various methods of profile analysis (spoligotyping, VNTR-MIRU) or by sequence analysis (multispacer sequence typing) enables the identification of isolates among the six Mycobacterium tuberculosis complex species as well as the detection of cross-contamination in the laboratory [1].

Additionally, it enables the diagnosis of patient-to-patient cross-transmission, including nosocomial cases, distinguishes between reactivation and new infections, and pinpoints the geographic origin of strains (geotyping). To increase the efficiency of direct diagnosis of pulmonary tuberculosis, the continual quest for new culture medium is a top priority. The Stop TB Strategy covers paediatric TB promotion and support, including diagnosis. Using current technologies, the detection of Tuberculosis (TB) in low-income nations needs to be improved [2]. Every facility interested in treating paediatric TB patients should have a steady supply of tuberculin. The diagnosis of pulmonary TB requires a Chest Radiograph (CXR), and hospitals should be able to take acceptable CXRs of young children. If a reputable laboratory service is available, certain cases should involve microbiological confirmation. Paediatric specimens should be handled adequately by the lab.

The preferred approach for collecting sputum from young children is gastric aspiration, which often generates higher yields than alternative procedures. With proper technique, outpatient results may not differ significantly from those obtained inpatiently. A straightforward alternative technique that requires less equipment is nasopharyngeal aspiration. A specialised room, expensive and ongoing equipment, and a devoted nurse are all necessary for sputum induction. Older outpatients who are unable to produce enough sputum can benefit from laryngeal swabs [3]. Every hospital should have a clinician who is skilled in fine-needle aspiration and trained in the diagnosis and treatment of paediatric TB, including the interpretation of CXRs. Radiologists and doctors should classify paediatric CXRs using a straightforward, recognised system that is used globally. All inpatients with TB should be under the supervision of the clinician(s) in charge of TB services, who should also take the lead in managing the TB clinic. The team should include a TB nurse specialist.

The local TB service, paediatricians, radiology departments, and laboratory services must work together to enhance the diagnosis and treatment of paediatric Tuberculosis (TB). The topic of pulmonary tuberculosis differential diagnosis is covered. Because tuberculosis can create three separate lesions on X-rays-an exudative lesion, a proliferative lesion, and a fibrotic lesion—and because it can spread throughout the entire structure, the chest X-ray results of pulmonary tuberculosis can be very different. Therefore, a wide range of illnesses are included in the differential diagnosis of pulmonary tuberculosis. Lung cancer and tuberculoma are the two most significant alternative diagnoses for nodule. The characteristic of the nodule and its surroundings, such as pleural indentation or knotching, provides a clue to the diagnosis [4]. The diagnosis via imaging does have a drawback, though, in that some tuberculomas might have characteristics that are similar to those of lung adenocarcinomas. It is crucial to collect the pathological or bacteriological evidence using the appropriate techniques. In well-equipped laboratories, sputum smear analysis for Acid-fast Bacilli (AFB) can diagnose up to 50–60% of cases of pulmonary tuberculosis.

Even lower rates of AFB detection can be attributed to insufficient access to high-quality microscopy services in low-income nations. Due to the paucibacillary character of pulmonary tuberculosis in individuals with HIV infection, the detection rate is additionally significantly lower in nations with high prevalence rates of both pulmonary tuberculosis and HIV infection. Most cases of pulmonary tuberculosis are diagnosed at the primary care level on the basis of clinical and radiological indications in the absence of positive sputum smears for AFB. In order to diagnose pulmonary tuberculosis in persons who have a tuberculosis suspicion but persistently negative sputum smear results, low-income nations use a variety of criteria, algorithms, scoring systems, and clinical markers. This review intends to evaluate these methods. To predict smear-negative tuberculosis, a number of clinical scoring systems and algorithms have been created depending on the local epidemiology. Few of these have been tested in the context of the area [5].

Conflict of interest

None declared

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Date of Submission: 09 May, 2022, Manuscript No. jprm-22-69827; **Editor assigned:** 10 May, 2022, PreQC No. P-69827; **Reviewed:** 16 May, 2022, QC No. Q-69827; **Revised**: 23 May, 2022, Manuscript No. R-72107; **Published:** 30 May, 2022, DOI: 10.37421/2161-105X.2022.12.609

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How to cite this article: Siddiqi, Kamran. "Commentary on the Clinical Diagnosis of Smear-Positive Pulmonary Tuberculosis." J Pulm Respir Med 12 (2022): 609.