



Current and evolving directions in childhood tuberculosis imaging

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Tuberculosis (TB) remains a global health concern. In 2021 alone, an estimated 10.6 million people fell ill with TB worldwide, 6.7% of whom have human immunodeficiency virus (HIV) coinfection. Between 2020 and 2021, at the height of the coronavirus 2019 (COVID-19) pandemic, the TB incidence rate rose by 3.6%, reversing the 2% decline per year that was seen for most of the previous two decades. There were 450,000 new cases of drug-resistant TB in 2021, which also increased from previous years. Approximately 1.2 million children below 14 years of age fell ill with TB in 2021, representing approximately 11.3% of all TB cases [1].

Tuberculosis is the 13th leading cause of death worldwide and is the second leading infectious killer after COVID-19. The estimated number of deaths from TB for 2021 is 1.6 million, which includes 187,000 with HIV. This number has increased, and like incidence, has reversed the decline seen between 2005 and 2019. Of these deaths, children (aged < 15 years) comprised 14% of HIV-negative and 11% of HIV-positive individuals [1].

Through the years, there have been significant advances in the detection of mycobacterial infection; however, TB diagnosis in children remains a challenge. Medical imaging plays an important role in TB diagnosis and follow-up in children. Radiographs have long been a mainstay, particularly in the evaluation of thoracic TB, but utilization of cross-sectional imaging with advanced techniques and protocols has accelerated in the last few years. There is a need

to keep abreast with the spectrum of imaging manifestations of childhood TB in various modalities and understand the evolving role of these imaging studies.

Through the efforts of the World Federation of Pediatric Imaging (WFPI) TB Group, a TB mini-symposium was released in the journal *Pediatric Radiology* in 2017. The special issue contained articles written by well-known childhood TB imaging experts, mostly from TB endemic countries, who worked together to provide a more global perspective [2, 3]. These articles comprehensively covered the diverse imaging patterns of TB to help enhance our knowledge concerning its pathophysiology and disease progression in various parts of the body. In 2023, another TB mini-symposium was released that supplements the previous issue by providing updates on various aspects of childhood TB imaging. The specific goals of this current mini-symposium are (1) to discuss the constantly evolving role of medical imaging in the evaluation of childhood TB, (2) to provide systematic, evidence-based recommendations on the appropriate use of various imaging modalities and advanced applications in the diagnosis and follow-up of children with suspected TB, and (3) to review the spectrum of classic imaging patterns of TB in the pediatric population. In the first batch of articles released in August 2023, Bernard Laya and colleagues present the imaging recommendations and algorithms for both pediatric thoracic and extrathoracic TB [4, 5], which is a helpful guide for radiologists and clinicians when deciding the most appropriate imaging study for various clinical scenarios. The article by Monica Miranda-Schaeubinger and colleagues presents the evolving role of chest radiographs for diagnosis of pediatric pulmonary TB [6]. A team of pediatric radiologists led by Nasreen Mahomed present a comprehensive review depicting the classic imaging findings of childhood TB in various parts of the body [7], while Elsinger and coauthors compare chest radiograph findings in ambulatory and hospitalized children with pulmonary TB [8]. Also included in the mini-symposium are articles on the use of artificial intelligence in pediatric TB by Jaishree Naidoo and colleagues [9] as well as information on global resources available in

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the fight against TB, by Joanna Kasznia-Brown [10]. This topic has not been covered before and brings new promising aspects in the fight against TB. The second batch of articles included in the mini-symposium focus on the use of ultrasound and magnetic resonance imaging in childhood thoracic TB by Sodhi and colleagues [11] and an article by Venkatakrishna and collaborators that compares chest radiographs against minimum intensity projection reconstruction computed tomography for detection of airway stenosis in children with lymphobronchial TB [12].

We would like to thank all the contributing authors without whom this mini-symposium would not have been possible. It was a memorable opportunity to work with an exceptional group of international colleagues who each brought valuable experience and expertise on various aspects of pediatric TB imaging. We thank the WFPI TB Group for their dedication and continuing efforts related to this advocacy. We also thank the journal *Pediatric Radiology* for providing a vehicle to disseminate these articles. Finally, we thank Prof. Amaka Offiah for her support and assistance in carefully editing each article of this mini-symposium on pediatric TB.

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Declarations

Conflicts of interest None

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