

## Tuberculosis in Newborns and Infants: A Case Series from a Tertiary Referral Center in Mexico

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### Abstract

Tuberculosis is a major and often under-recognized cause of disease and death in children. The latest WHO global tuberculosis data reports that, of the total cases worldwide, approximately 1 million occurred in children younger than 15 years. Despite prevention policies and treatment efforts, Mexico remains an endemic country for tuberculosis disease. Information on tuberculosis in newborns and infants is scarce. We report 14 cases of tuberculosis in Mexican children younger than 1 year.

**Keywords:** Tuberculosis; Newborns; Infants

### Abbreviation

INP: National Institute of Pediatrics; WHO: World Health Organization; IGRA: Interferon-Gamma Release Assay; BCG: Bacillus Calmette-Guerin

### Introduction

Tuberculosis is a serious public health issue and a leading infectious cause of death in children. The World Health Organization (WHO) estimates that a total of 10 million new cases of tuberculosis are diagnosed worldwide each year, reporting a global burden of disease in children of 1 million cases and 210,000 deaths [1,2]. Compared to adult populations, children are usually a neglected group of study for tuberculosis, specially newborns and infants younger than 1 year [3,4]. Available data regarding the clinical profiles in these age groups are limited, and due to its non-specific presentation, tuberculosis in newborns and infants is a challenging diagnosis that requires a high index of suspicion [5]. Despite significant preventive and therapeutic efforts, Mexico is considered an endemic country for tuberculosis [6,7]. *Mycobacteria* infections deserve a careful study in children, as they might be considered an indicator of community tuberculosis control in adults [8]. The objective of this study is to describe the epidemiologic and clinical features of newborns and infants with tuberculosis from a tertiary referral center in Mexico.

### Case Report

We analyzed the clinical records of infants younger than 1 year with diagnosis of tuberculosis from the National Institute of Pediatrics (INP) in Mexico, from 2011 to 2018. The INP is a tertiary referral pediatric center with a specialized tuberculosis clinic for children and adolescents. Demographic, clinical, radiological, and microbiological data were obtained. Newborns were defined as subjects 28 days or younger; whereas infants were defined as subjects older than 28 days but younger than 1 year old. The diagnosis of tuberculosis disease was considered in those subjects with a suggestive history, physical examination, and/or radiological findings; supported by either culture, histopathology, and/or GeneXpert MTB/RIF® Assay. Interferon-gamma release assays (IGRAs) were not considered as a diagnostic criterium due to their low specificity in children younger than 5 years. From 2011 to 2018, a total of 14 subjects with either cutaneous, meningeal, skeletal, pulmonary or lymph node tuberculosis were detected and included. Two of them were newborns, with a mean age of 25 ± 2.8 days. The two cases were diagnosed with Bacillus Calmette-Guerin (BCG)-related adenitis and had no direct contact with people with suspected or confirmed infectious tuberculosis. Total mean age at the time of the diagnosis was 4.9 ± 3 months. All cases had a positive history of BCG immunization. A confirmed immunodeficiency was documented in 5 cases (26.3%). Lymph node tuberculosis was the most prevalent disease (78.7%) followed by pulmonary, meningeal and skeletal tuberculosis (7.1% respectively). The most common was adenitis (78.6%), referred by caretakers as the appearance of a slowly-growing painless mass. Lymphadenitis was most frequently found in the cervical region (72%) and all patients had unilateral involvement. Fever was present in 21.4% of all cases. Weight loss and diaphoresis were not commonly referred. From the 11 cases of lymph node disease, biopsy was positive for tuberculosis in 64%. Microscopic examination of sputum from 7 children revealed the presence of acid-fast bacilli (AFB) in 14%. In chest radiograph were present in 58% of all cases, being the most common pattern a bilateral infiltration of the lungs (42%), followed by hilar enlargement. Three cases were diagnosed with a positive GeneXpert MTB/RIF® Assay. A positive culture was found in 21.4% of all cases. Overall mortality was 0%.

### Discussion

We report 14 cases of tuberculosis in Mexican children younger than 1 year, from 2011 to 2018. Due to its low prevalence in newborns and infants, the diagnosis of tuberculosis disease can be easily missed. Physicians must be sensitized with the clinical and paraclinical features of tuberculosis in this age group [9]. In our study, most cases presented as tuberculous lymphadenitis, including 2 newborns with BCG-associated adenitis. In contrast with previous reports, our findings suggest a high prevalence of extrapulmonary tuberculosis with a low prevalence of meningeal tuberculosis in infants [10].

## Conclusion

Knowledge of the epidemiology and clinical presentation of tuberculosis in infants is crucial in order to reinforce prevention and apply timely treatment strategies.

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