

A Commentary on Hospital Infection Control for Infant and Mother Tuberculosis

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About the Study

Pediatric Tuberculosis (TB) has been steadily declining, with severe cases such as miliary tuberculosis and tuberculous meningitis becoming increasingly rare. However, pediatric TB often arises from familial transmission, with over half of the infections originating from parents. Moreover, in facilities where many newborns and infants are unvaccinated with Bacillus Calmette-Guerin (BCG) or are in an immunosuppressed state, delayed diagnosis of TB can lead to significant nosocomial infections.

In this report, we discuss the study of a 10-month-old infant who was transferred to our hospital with suspected miliary tuberculosis and tuberculous meningitis. Through detailed history-taking, it was determined in a relatively short period that the infant's mother had active pulmonary tuberculosis. The infant presented with fever, seizures and worsening hydrocephalus, leading to the transfer. Although acid-fast bacilli smears of blood, Cerebrospinal Fluid (CSF), gastric juice and tracheal aspirate samples were negative upon admission, imaging studies raised suspicion of tuberculous meningitis and miliary tuberculosis. The infant was immediately isolated and TB treatment was initiated. On the second day of admission, it was discovered that the accompanying mother had a history of TB treatment during childhood and had respiratory symptoms. By the fourth day, she was diagnosed with active pulmonary tuberculosis. It took three weeks to reach a definitive diagnosis for the infant. This study reinforced the importance of implementing infection control measures from the suspicion stage, especially considering that family members, such as the mother, are likely sources of TB infection in infants, necessitating prompt action.

Pediatric TB differs from adult TB in that it is more commonly observed in infants and young children. It is characterized by mediastinal

and hilar lymphadenopathy and a higher propensity for severe forms such as miliary TB and tuberculous meningitis due to hematogenous dissemination. Unlike adult TB, which is often detected through symptoms like cough or fever, pediatric TB may present in seemingly healthy infants who can suddenly develop symptoms such as fever and seizures. In this study, the infant rapidly progressed to a severe condition with persistent fever, seizures and worsening hydrocephalus, leading to the rare co-occurrence of miliary TB and tuberculous meningitis.

Administrative testing conducted at the Miyazaki Institute for Public Health and Environmental Science revealed a clear epidemiological link between the mother and infant. The genetic profiles of the isolated TB strains were identical according to the Variable Numbers of Tandem Repeats (VNTR) method, confirming familial transmission from the mother to the infant.

Possible sources of nosocomial TB infections in children include healthcare workers, family members, caregivers and other patients sharing the same room. To prevent nosocomial infections, it is essential to identify infectious TB patients early, manage the health of healthcare workers and closely monitor the health of family members accompanying the patient. In this study, although the ward had many newborns and infants who were unvaccinated or immunosuppressed, the index patient's smear was negative, the diagnosis was made quickly and appropriate measures were promptly implemented. Additionally, while the mother was shedding bacteria and short stay as a caregiver likely helped prevent secondary infections in the hospital.

This commentary highlights the importance of proactive investigation and prompt response, particularly in pediatric TB cases where family members, such as the mother, are likely to be the source of infection.