

Childhood Tuberculosis: A Preventable Disease Not Being Prevented

In March 2012, childhood tuberculosis (TB) was the focus of World TB Day. This neglected disease still accounts for at least 1 million annual cases and 100 000 deaths in children. The World Health Organization (WHO) estimates that 9.7 million children have been orphaned by TB.¹ The articles in this edition of *Pediatrics* by Wu et al² from China and Winston and Menzies³ from the United States remind us of the ongoing scourge of this ancient disease in both high- and low-prevalence countries and highlight many issues that need to be addressed to control it.

The study from the Beijing Children's Hospital reveals the continued high global morbidity and mortality of childhood TB. This study details many unsolved problems in childhood TB globally: huge burden of disease; high propensity for severe forms of extrapulmonary disease; incomplete protection afforded by BCG vaccines; diagnostic delays; high treatment failure rates; and lost opportunities for prevention.^{4,5} We wonder how many of these cases could have been prevented with routine use of isoniazid preventive therapy, an effective and cost-effective intervention among child household contacts.⁶ However, in most high-burden settings, use of isoniazid preventive therapy to treat children identified through contact investigation is not common practice nor recommended for school-aged immunocompetent children by the WHO.⁷ Although this article did not address drug susceptibility, high rates of multidrug resistance have been reported recently in China,⁸ potentially contributing to the 14% treatment failure rate in the children. This article aptly illustrates the significant need to develop new strategies for the treatment and prevention of childhood TB to improve global child survival, as detailed in the WHO Millennium Development Goals.⁹

In 2011, over 60% of US TB cases occurred in foreign-born persons.¹⁰ The study by Winston and Menzies³ demonstrates the major influence of the global TB burden on control of domestic childhood TB. Only one-quarter of children with TB lacked international birth or travel history for the child or parent, and one-half of US-born children with TB had known contact with a foreign-born case. The most effective and cost-effective strategy to prevent future cases of disease in foreign-born individuals is to diagnose and treat latent TB infection (LTBI) at or shortly after entry into a low-prevalence nation.¹¹ Recent modifications to US immigration guidelines require tuberculin skin tests (TSTs) on children 2 to 14 years of age,¹² a population that previously went unscreened. However, LTBI treatment rarely occurs before immigration and is predicated on having entry into the US health care system, a notorious barrier for recent immigrants. A complementary strategy would be to invest in the TB infrastructure of nations with high TB prevalence sending large numbers of immigrants to the United States.¹³

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ABBREVIATIONS

LTBI—latent tuberculosis infection
TB—tuberculosis
TST—tuberculin skin test
WHO—World Health Organization

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Assessing TB risk factors should not stop at the border. In 2000, the Centers for Disease Control and Prevention and the American Academy of Pediatrics recommended against universal testing with the TST.¹⁴ Instead, the recommendation was to screen all children for TB risk factors by using a validated questionnaire and to perform TSTs only on children with identified risk.¹⁵ There may have been 2 unintended consequences of this policy shift. First, TB risk factor screening may have been de-emphasized when routine tuberculin testing for all children at well-child visits was eliminated. Additionally, the Centers for Disease Control and Prevention and the American Academy of Pediatrics recommendations assume that children have a medical home. With rising numbers of uninsured children, alternative venues for providing preventive health services are critical. One possible strategy to maximize coverage would be to

integrate preventive services (consisting of risk assessment and referral of identified children for testing) into the schools, which are used by the vast majority of high-risk families. A second unintended consequence may have been minimizing the role of parental foreign birth. Two-thirds of US-born children with TB had at least 1 foreign-born parent. This is not 1 of the risk factors identified in most screening questionnaires but warrants further investigation.

Another emerging trend in US TB is the increased rate of drug resistance in isolates from foreign-born persons.^{3,10} Winston and Menzies³ demonstrated that 18% of *Mycobacterium tuberculosis* isolates from foreign-born children with foreign-born parents were resistant to isoniazid, and 8% were multidrug-resistant, as compared with 6% and 0.4%, respectively, for all US-born TB cases.¹⁰

It is likely that rates of drug-resistant LTBI also are higher among children with risk factors related to foreign birth or travel of the child or parents. High rates of isoniazid resistance call into question current strategies recommending 9 months of isoniazid for all children with LTBI unless contact with a specific drug-resistant case is determined. Perhaps further examination of the data as reported by Winston and Menzies³ can provide insight to help pediatricians decide when the risk of isoniazid resistance is high enough to consider using a rifampin-containing regimen for treating LTBI.¹⁶

The majority of childhood TB is preventable. These articles reveal what happens when prevention strategies are inadequately addressed. Better application of risk questionnaires and improved contact tracing would prevent many of the US cases of childhood TB.

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