

Missed opportunities in the diagnosis of pulmonary tuberculosis in children

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Abstract In 52% of children with confirmed and probable tuberculosis the diagnosis could have been made earlier than it was. The main clinical clues which should have led to suspicion of tuberculosis were close adult contacts and previous recurrent respiratory tract infections.

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Although the main focus of tuberculosis control is on the detection of culture-positive adults who spread the disease, the early detection of children with tuberculosis will prevent progression of the disease in these children and also help with the tracing of infectious adult contacts.

We describe a study of 177 children with confirmed and probable tuberculosis and emphasise the opportunities in many of these children for the earlier diagnosis of tuberculosis.

Patients and methods

During a 4-month period, September to December 1990, children with respiratory symptoms and signs seen in the hospital were regarded with a high degree of suspicion for tuberculosis. Particular attention was paid to a previous history of lung problems, hospitalisation, close contact with an adult with tuberculosis and percentile of mass for age.

Tuberculin skin testing was done with the percutaneous Tine test (Lederle) or the Mantoux test (5 units of purified protein derivative). A Tine value greater than grade II, or a Mantoux test with a more than 10 mm induration was regarded as positive. Anteroposterior and lateral radiographs of the chest were taken and early morning gastric aspirates were cultured by means of a radiometric method (Bactec).

Results

One hundred and seventy-seven children (95 of them (54%) under the age of 2 years) were identified as having confirmed (122; 69%) or probable (55; 31%) tuberculosis according to World Health Organisation criteria,¹ modified for an endemic area.^{2,3} Probable cases were those patients who had a chest radiograph suggestive of tuberculosis together with weight loss or failure to gain weight and/or a history of close contact with an adult with pulmonary tuberculosis and/or a positive tuberculin skin test. Children with signs on chest radiograph typical of tuberculosis (e.g. miliary tuberculosis, lymphobronchial tuberculosis) were also included in this group. Confirmed cases were those with positive cultures of *M. tuberculosis* on gastric aspirate or other fluids.

In 92 (66 confirmed and 26 probable tuberculosis cases) (52%) of the 177 children the diagnosis could

have been made earlier. In 63 cases (69%) there was a clear history of close contact with an adult with tuberculosis, but the child was not screened for tuberculosis and did not receive prophylactic treatment. In 9 children (10%) a chest radiograph suggestive of pulmonary tuberculosis had been taken on a previous occasion, 38 (41%) had previously been treated for 'lung infections' and 3 (3%) had had 'repeated lung infections' as well as an adult contact.

Radiological features which occurred more often in children in whom the diagnosis was missed compared with those in whom the diagnosis had not been missed included paratracheal lymph nodes (42% v. 24%), lymphobronchial tuberculosis (24% v. 9%) and miliary tuberculosis (2% v. 0%).

Discussion

From 1989 to 1990 the incidence of tuberculosis in the western Cape rose from 575 to 639 new cases per 100 000 population.^{4,5} The diagnosis of tuberculosis in childhood is difficult and was infrequently confirmed in past African studies.^{2,3} Therefore a history of close contact with an infectious adult and the occurrence of repeated or persistent respiratory infections in children in an area of high tuberculosis incidence should alert health workers to the possibility of tuberculosis. In this study the diagnosis could have been made earlier in 52% of children with confirmed and probable tuberculosis. Not only might this have led to an earlier evaluation of the adult contacts, but the findings on chest radiography suggest a tendency to more extensive lung disease in those in whom the diagnosis was delayed.

It has been suggested that the 5,7 times higher reported incidence of tuberculosis in children under the age of 4 years in the western Cape, compared with those in the rest of South Africa,⁴ may be the result of over-eager reporting of suspected cases. Evaluation of diagnostic criteria at a local authority clinic suggested that this was not the case.³ Our experience during the present study, where 69% of cases were confirmed by culture of *M. tuberculosis*, suggests that tuberculosis in childhood may in fact be under-reported in the western Cape as the diagnosis had previously been overlooked in 52% of the children found to have confirmed and probable tuberculosis.

The main clinical clues which should have led health workers to suspect tuberculosis were either a close adult contact or previous repeated respiratory tract infections. A high degree of suspicion is necessary to diagnose tuberculosis in childhood. Young childhood contacts of sputum-positive adults are particularly at risk for infection and disease, while in an area of high incidence, any lung infection not responding to therapy must be considered as possibly being tuberculosis.

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