

## Short reports

# Heaf test results after neonatal BCG

P A G CRAWSHAW AND A H THOMSON\*

Community Child Health Department, Derby and \*University Department of Child Health, Leicester

**SUMMARY** Heaf testing was carried out on 98 preschool Asian children who had received a BCG vaccination. A strongly positive Heaf reaction (grade 3) occurred in only two children. Heaf testing can still be used in tuberculosis screening after neonatal BCG.

Most Asian children born in Britain have BCG vaccination in the neonatal period. A number subsequently present after contact with a case of tuberculosis. The interpretation of a positive tuberculin test in such children is difficult.

In an attempt to address this problem we have surveyed tuberculin positivity in previously vaccinated preschool British born Asian children.

### Patients and methods

Asian children born in Derby have routine BCG vaccination given by specially trained health visitors using Dermo-jet (dose 0.1 ml). A routine check on conversion is made at three months by Heaf testing and infants with no response are revaccinated (about 2%).<sup>1</sup> From the population vaccinated in the standardised manner 98 preschool children were entered into the study. This represents about 5% of the Asian preschool population of Derby. They were recruited from one child health clinic when they or a sibling were attending for routine developmental surveillance or immunisation. Children were excluded from the study if they were currently taking oral corticosteroids or if they had had measles illness or immunisation in the preceding two weeks. None was thought to be at risk from tuberculosis before entering the study.

All children had a standard Heaf test with a spring loaded multiple puncture Mark 6 Heaf gun set at 1 mm for those less than 2 years old and 2 mm for those over 2 years, administered by one operator (PAGC). Results were read three to seven days later by the same operator. Children found to be

grade 3 or 4 positive were referred to the local chest clinic for chest radiography and further review.

### Results

Forty seven boys and 51 girls entered the study. All had a visible BCG scar. Fifty one children were of Pakistani Muslim origin; 35 were Punjabi Sikhs; seven Punjabi Hindus, and five were from other Asian ethnic groups. Eighty six of the children were first generation United Kingdom citizens. Overall there were 14 children (14%) who showed a grade 0 response, 75 (76%) with grade 1, seven (7%) with grade 2, two (2%) with grade 3, and none with grade 4. There was no significant difference in the responses at different ages (table).

Nineteen children had a family history of tuberculosis (four grade 0, 14 grade 1, one grade 2) and eight were known to have been in contact with someone who had been treated for tuberculosis (two grade 0, six grade 1). The two children with grade 3 responses were siblings of Pakistani Muslim origin; there was no family history of tuberculosis, no history of contact, nor of travel abroad. They were seen at the chest clinic, found to have normal chest radiography and no further action was taken.

### Discussion

British born Asian children are at a much higher risk

Table Number of children in each age group with each Heaf grade result

Age (months)	Heaf grade result				
	0	1	2	3	4
6-18	4	30	1		
>18-30	4	12	1	1	
>30-42	3	18	1	1	
>42-60	3	15	4		
Total	14	75	7	2	

of tuberculosis than their white neighbours,<sup>2</sup> and for this reason most have BCG given in infancy. Figures on the degree of tuberculin positivity in early childhood after BCG vaccination in infancy have been reported from around the world but Capewell and Leitch make the point that positive tuberculin tests should be viewed in the context of the tuberculin profile of the local population.<sup>3</sup> A strongly positive Heaf test (grade 3 or 4) occurred in only 2% of our sample population.

An ethnically similar population to that reported here was studied in Birmingham by Grindulis.<sup>4</sup> The tuberculin positivity was assessed at 22 months of age and 50% of the children had a negative response to Mantoux 10 tuberculin units and 25% were found to have no BCG scar. In contrast all our children had visible scars and only 14% were entirely Heaf negative. This may reflect the effectiveness of a standardised vaccination procedure.<sup>1</sup> Strongly positive tuberculin reactions were rare in both studies (H Grindulis, personal communication). It should be pointed out, however, that the jet injection technique used in Derby is no longer recommended for BCG.

The increased risk to Asian children in Britain may be related to the ease of travel abroad and to relatives visiting. Many Asian children are seen at contact clinics and Ormerod has recently shown the effectiveness of a programme of chemoprophylaxis in this group.<sup>5</sup> The British Thoracic Society recommendations do not give clear guidelines on the management of the Asian child contact with pre-

vious BCG.<sup>6</sup> The results of this study suggest that the British born Asian child should be treated like his white counterpart.<sup>6</sup> When seen as a tuberculosis contact a strongly positive Heaf test should be taken as suggestive of recent infection, whether or not the child has previously had BCG. Such children should be carefully reviewed and considered for chemoprophylaxis or prolonged follow up.

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Correspondence to Dr AH Thomson, University Department of Child Health, Clinical Sciences Building, Royal Infirmary, PO Box 65, Leicester LE2 7LX.

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## Tuberculin response after neonatal BCG vaccination

L P ORMEROD AND J M GARNETT

*Chest Clinic, Blackburn Royal Infirmary, Blackburn*

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**SUMMARY** Of a total of 846 children of Indian subcontinent ethnic origin given neonatal BCG vaccination, 823 (97%) were tuberculin positive when tested six to nine weeks after vaccination. The results show an initial immunological response to the vaccination. The possible reasons for the disparity between these results and others are discussed.

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BCG vaccination shortly after birth in children of Afro-Asian ethnic origin is recommended by the Joint Tuberculosis Committee.<sup>1</sup> It has been routine policy to offer neonatal BCG to children of Indian

subcontinent ethnic origin in Blackburn since 1963. After the report of Grindulis *et al* that showed a poor immunological response at 22 months after such vaccination,<sup>2</sup> a prospective study of early response to BCG vaccination was undertaken.

#### Subjects and methods

A total of 863 neonates of Indian subcontinent ethnic origin received BCG vaccination by intradermal injection from the resident paediatric medical staff between August 1984 and July 1985 inclusive. Home visits were carried out by community nursing staff and a tuberculin test carried out and read