Tuberculin response after neonatal BCG vaccination

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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.

BCG vaccination shortly after birth in children of Afro-Asian ethnic origin is recommended by the Joint Tuberculosis Committee. 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, 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...
72 hours later. Initially we planned to perform the tuberculin test at eight weeks after vaccination, but due to various reasons—for example, change of address, visits to relatives, hospitalisation, and intercurrent illness—in practice this was carried out from six to nine weeks after vaccination.

Of the 863 vaccinated children, 846 had a tuberculin test performed. Parents of two children refused permission, 15 had moved and could not be traced by nine weeks after vaccination. The tuberculin test used was the Tine test (Lederle). The reaction was graded 0–4, as with the Heaf test, reaction 0 being negative, grades 1–4 being positive. The presence of local BCG abscesses was also recorded.

Results

The results are shown in the table. Twenty four children had small subcutaneous abscesses, with peak numbers found in those vaccinated in August (n=6) and February (n=5) at times of medical staff changeover. Twenty abscesses settled with dry dressings or aspiration, or both; four children were given short courses of topical or oral isoniazid.

Discussion

The results of this prospective study of a cohort of neonatally vaccinated children over one year shows that, as judged by a positive tuberculin test, they have developed an immunological response by age 9 weeks. Two recent reports of response to vaccination neonatally or at 3 months also showed a very high positive tuberculin reaction rate. Hadfield and Allen prospectively showed a 98.3% positive Heaf test result three months after neonatal subcutaneous BCG given by Dermojet injector in Derby. Packe and Innes, in a case-control study, showed a 94% positive tuberculin positive rate assessed three months after vaccination at age 3 months.

The results reported by Grindulis et al. are at variance with the results reported here, and those from Derby and Birmingham, when tuberculin status was assessed two to three months after vaccination. A large number of factors determine whether tuberculin sensitivity develops after BCG vaccination, its initial strength, and the persistence of such tuberculin sensitivity.

There are two possible explanations for the discrepancy between Grindulis’ children and those reported here and elsewhere. (1) Grindulis’ children did not have a high percentage of initial tuberculin positivity after vaccination. This could have been due to faulty vaccination technique, but this is unknown because no initial tests were carried out. (2) Although tuberculin sensitivity seems stable in older white children after BCG vaccination, this sensitivity may not be stable in children from the Indian subcontinent ethnic group who have a different risk of tuberculosis in the United Kingdom.

It is likely that routine BCG vaccination at age 13 will be phased out by 1990 in England and Wales, and the only protection given to children of Afro-Asian ethnic origin will be that given to them by neonatal BCG. In view of the discrepancy between the early results of tuberculin testing in this ethnic group after BCG, and that reported two years after vaccination, it is important to know the result of serial tuberculin tests in the Indian subcontinent ethnic group to see if there is a difference from the white ethnic group. We intend to carry out a further prospective study of a random proportion of the children reported in this paper, to assess their tuberculin response, four years after vaccination.

References


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