Hand, foot and mouth disease—1973

M. H. DALE, F.R.C.G.P.
General practitioner, Bloxwich, Staffs

SUMMARY. Nine cases of hand, foot and mouth disease were found in a small area within a month. The condition is benign, commonest in small children, and the infectivity is low. It is suggested a fuller investigation be considered in 1976.

Initial observation

On 16 July 1973 as evening surgery was ending Mr and Mrs ' W ' walked in with their young son ' M ' age three (case 1) They said they had come straight from a children's party; they had noticed that ' M ' had a rash on his hands when they collected him. Examination revealed a bullous eruption on the palm of both hands, the toes of both feet, and in the mouth; there was no constitutional disturbance.

A provisional diagnosis of hand, foot and mouth disease was made. The parents were reassured, but told further contact would be made in the morning.

I decided that this episode presented an excellent opportunity to study the infectivity and epidemiology of this comparatively rare general-practice disease. Between 16 July and 18 August, nine cases in all were observed.

Demography

The area is one of high density urban development and all the cases occurred within a three mile radius of the health centre which includes ten general practitioners. Six more general practitioners work within the area, and the population at risk from which the cases occurred is estimated at 35,000. The health centre has a fully-integrated ancillary, paramedical and nursing staff.

Method

The Medical Officer of Health agreed to alert all health visitors and district nurses about reporting any further cases. One health visitor, Mrs M. Baker, was attached as research-worker.

In retrospect the decision to use health visitors rather than general practitioners as first-line visitors for contacts was correct. The health visitor's visits caused less anxiety and also uncovered some hitherto unknown problems.

The other general practitioners in the area were approached and asked to notify any cases they saw and to allow investigation of their patients who were contacts.

Dr I. A. Harper, microbiologist, was also approached and decided to try to reach a laboratory diagnosis by:

(1) culture in tissue and culture in animals from nose, throat and stool swabs,

(2) antibodies from two samples of sera taken at intervals of two weeks,

(3) Full blood count and ESR on the initial case.

As all the party-goers were young children, it was decided that stool culture only would be carried out in contacts, it was hoped that this would be relatively simple and

fairly effective. It was also decided that only cases with the classic distribution of lesions in hand, foot and mouth disease would be included in this series.

It was generally considered that a florid case presentation may be ' atypical case ' and that the norms are simple herpetiform eruptions or are sub-clinical cases. We did not try to trace other types of presentation because of lack of time and money.

Clinical description

All the nine cases were benign, the lesions were of a bullous nature, apart from the three classic sites; lesions were also seen on the buttocks. The lesions all lasted less than a week. Eight cases were in children under seven years of age and only one adult was found. There were three males and six females. The main complaint was of soreness in the mouth.

Progress

On 17 July case one ' M ' was seen again and the necessary specimen taken. A further sample of blood was taken two weeks later. The lesions were photographed.

Confirmation of *Coxsackie virus A16* infection was obtained only after three months. A similar time elapsed before receipt of the confirmatory antibody response.

The health visitor visited all the parents of the party attenders, left a stool pot for specimen collection and explained the procedure. During the next few days further visits had to be made to ensure collection; two failures were registered.

Investigations

There were 12 children at the party. Stools of eight children were entirely negative. One child (J. C.) had *Echo Virus type 11* isolated (Report 13 August) and *Coxsackie A16* on suckling mouse (Report 25 October), this child did not develop hand, foot and mouth disease. One child (L. J.) had *Adenovirus type two* isolated.

The only party attenders who had hand, foot and mouth disease were the remaining two children. In cases one and two *Coxsackie A16* was isolated.

Cases

Case one M. W. age 5	16 July
Case two I. W. (sibling of case one) age 7	19 July
Case three N. P. aged 16 months. This baby lives 2 miles from cases one and two. There is a tenuous link by a neighbour of case one who regularly does her shopping in the area of case three.	25 July
Case four Mrs S.	30 July
Case five T. S. age nine months. This is the child of Mrs S. who lives 200 yards from cases one and two.	30 July
Case six C. F. age 3	13 August
Case seven G. F. age 4	13 August
Nine were siblings living half a mile from cases one, two, four and five.	
Case eight S. P. age two months. This baby lives 3 miles from other cases	17 August
Case nine N. E. aged 3½. This child lives 1 mile from cases one, two, four, five, six and seven.	17 August

Details of first case

18.7.73 Hb. 13·6 g/100ml; W.B.C. 6,400/cmm, N. 37 per cent L. 58 per cent. M. 5 per cent. Appearance normochromic and normocytic, E.S.R. 35mm Westergren.

Suckling mouse inoculation *Coxsackie A16* isolated (Report 23.10.73)

Neutralisation antibody titre v. *Coxsackie A.16* Specimen one 17.7.73 1·40 Specimen two 31.7.73 1·80 (Report 4.10.73).

Age distribution

Nine months, 16 months, 2½, 3, 3½, 4, 5, 6, and an adult.

The serial interval

Hand, foot and mouth disease in this epidemic presented in brothers (cases one and two). There had been no cases reported in this area before this; and none of my colleagues could recall a similar epidemic in previous years. Most of the cases were in young children, unlikely to have been exposed to the 1970 epidemic, so it was, at first, difficult to see from where the infection had arisen. On enquiry it turned out that the family of the first two children had been on holiday in Devon ten days before the eruptions first appeared.

A. J. Gray (personal communication) confirmed that there had been an epidemic of this disease in the Ilfracombe area at the time of the family's visit. This Ilfracombe epidemic appeared to have been secondary to an outbreak at Woolacombe (Devon) six miles away.

The incubation period of the disease is said to be three to five days, and as this does not fit with the serial interval of 10–13 days in the first two cases an alternative source of infection had to be found, or a longer incubation period postulated.

In this case the probable source of infection was the father of the first two cases from whom a positive stool culture in suckling mouse of *Coxsackie A16* was eventually obtained, and it is to be presumed that the father acted as carrier. At no time did the father exhibit any overt symptoms of hand, foot and mouth disease.

The serial interval of 6–18 days can be accounted for by undetected carriers in the community.

Cases	*Intervals*
nought→one and two	10–13 days +
one and two→three	6–9 days
one and two→four and five	11–14 days
four and five→six and seven	14 days
four and five→eight and nine	18 days

Infectivity

The infectivity is difficult to interpret if sub-clinical carriers are responsible. As the first case was at a party when he was probably of his most infectious, and as only his brother caught the disease (and he presumably did so from the father) it seems that the epidemic did not have a high infectivity. In addition it was possible to culture *Coxsackie A16* virus from the stool of only one other child.

Discussion

This epidemic illustrates some research problems:

(1) The sporadic nature of epidemics. Not only do they occur at about triennial intervals, but they may be widespread.

(2) Hand, foot and mouth disease is unlikely to be seen by more than a few general practitioners, and as comparatively few practitioners are orientated to research projects as is necessary in hand, foot and mouth disease, the elucidation of problems is even more difficult.

Perhaps it would be possible to start organising research for the probable 1976 epidemic now through the research organisation of the College. There are formidible obstacles to be overcome, not only financial, but I hope that this report may stimulate enough interest to encourage further work.

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