OUTBREAK OF SUSPECTED "HAND, FOOT AND MOUTH DISEASE" IN AN ARMY COMMUNITY

Lieutenant-Colonel W. R. O. EGGINGTON
Headquarters 1 Division, B.A.O.R.

Captain P. G. HOWIE, M.B., Ch.B., R.A.M.C.
British Military Hospital, Hannover

SUMMARY: A brief account is given of an explosive outbreak of hand, foot and mouth disease caused by a Coxsackie A16 virus in a British military community in Germany.

The clinical features and treatment are described and a comment is made on the predicted spread of the disease compared with the actual experience.

History of the outbreak

At the beginning of June 1969, cases of ulceration of the mouth associated with vesicular eruptions on the hands and feet started to appear amongst dependants of British troops in a garrison in West Germany. The actual date of the outbreak is, in retrospect, not possible to ascertain as some cases presented with mouth ulcers only and could well have been diagnosed as apthous ulcers. By the end of June about 30 cases had occurred, all in the two to three years age group. In the garrison at that time there were four British kindergarten schools, two in the centre of the town and two on the periphery. Cases occurred in the two central kindergartens but also in children not attending any of the institutions. The two peripheral kindergartens remained clear throughout the period of the outbreak. The two kindergartens involved were inspected early in June. Nothing untoward was found except that the cups used for mid-morning drinks were found to be of rough plastic and difficult to clean. Fresh cups were purchased and water sterilising powder issued for their sterilisation after use. This action appeared to have little or no effect on the spread of the disease. Cases in the kindergartens increased in number and by the end of June the position was such that the two involved were closed.

Early in July cases began to appear in school children attending the one primary junior school in the garrison. The school was inspected as soon as the cases appeared and two points were noted which were thought to be germane. Firstly the two drinking-water fountains in the school were of a very poor design and could not avoid being contaminated by the drinkers mouth when being used; their use was banned. Secondly, the steriliser in the kitchen for the crockery and cutlery used for school lunches was not working efficiently. The apparatus was designed for use with British gas whereas the school was supplied with Calor Gas. The result of this was that water in the steriliser could not be heated above 70°C. While representatives of the manufacturers were contacted to deal with this, the school was supplied with water sterilising powder for immediate use. Cases continued to appear and all pupils (350) in the school were examined. To the consternation of the examiners 153 pupils were found to have lesions. A break-
down of the cases by age (Table I) showed a definite bias towards first year infants with the remainder spread uniformly through the rest of the school.

Table I

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<th>Age</th>
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<tr>
<td>5—6 years</td>
<td>55</td>
<td>8—9 years</td>
<td>23</td>
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<td>6—7 years</td>
<td>31</td>
<td>9—10 years</td>
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<td>7—8 years</td>
<td>32</td>
<td>10—11 years</td>
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The small number of ten to eleven year old children affected is not considered relevant as there were only a few children of that age group in the school. Most of the children presented with relatively mild symptoms. The 15 school teachers and the cleaning and kitchen staff were also examined and found to be clear. At this point a major decision had to be reached on whether to close the school or not. The relatively mild condition of the disease coupled with the potential risk of alarm in the garrison should such a step be taken, made the medical authorities decide to leave the school open. In any case, it was probable that the remainder of the school was incubating the condition, so that closing the school would have little or no value. It was however decided to remove the infected children until the overall picture became clearer. Each child was given a note for the parents explaining the situation in language couched to avoid anxiety. Five days after the school inspection the remaining 197 pupils were examined and 185 had lesions again mainly in the mouth. To make matters worse two school teachers also developed symptoms in the next twenty-four hours. In view of the school's massive infection, the children that had previously been kept away were returned to school for the remaining three weeks of the term and no isolation action taken save withdrawing the school from a six-sided inter-school athletic tournament. In the next two days four more teachers went ill, so making 50 per cent of their number affected at one time or another. At this point the outbreak died away, only four more cases being seen in the next week—two school teachers, one child and one adult unconnected with the school.

Clinical features

There appeared to have been no prodromal symptoms, and 90 per cent of cases presented with oral lesions only. The oral lesions began as greyish thin-walled vesicles with little or no surrounding reaction. These rapidly broke down to form painful shallow ulcers 1-3 mm in diameter chiefly affecting the buccal sulci, the inside of the cheeks, the soft palate and the tongue. It was noticed that the younger children tended to have more lesions than their older counterparts, but only two children had sufficient discomfort for the lesions to interfere with eating. The remaining 10 per cent, as well as having the oral lesions described above, presented with greyish vesicular eruptions on either the hands or feet or both. One infant had lesions extending up the legs to involve the napkin area. The number of vesicles varied greatly from two or three in most cases to several hundred in a few. These cutaneous lesions were circular, up to 5 mm in diameter, affected
Outbreak of Suspected "Hand, Foot and Mouth Disease" in an Army Community

only plantar and palmar surfaces when feet and hands were involved. In more extensive cases in which the legs were involved, it was noticed that the anterior aspects were spared. Usually the only surrounding reaction was a small area of erythema round the vesicle, but occasionally secondary infection was present. The vesicles did not rupture spontaneously but regressed in about a week without treatment. It is interesting that no case presented with hand or foot lesions alone, the mouth always being involved. As mentioned above there were no prodromal symptoms, younger children up to the age of six years sometimes had an accompanying pyrexia of about 100°F for the first forty-eight hours of the illness but this was unassociated with any systemic effects. No cases of vomiting, diarrhoea, abdominal pain or meningism occurred and associated lymphadenopathy was only observed in those few cases which secondary infection of the skin vesicles occurred.

Treatment

This consisted of the application of an aqueous solution of gentian violet to the oral lesions and glycerine and borax to those in which pain was a predominant feature. The skin lesions were cleaned carefully with soap and water several times daily and chlorhexidine cream applied in an effort to prevent secondary infection from possible trauma. At the start of the epidemic the lesions healed in three to four days, but towards the end they were taking seven to ten days; no explanation of this observation is offered. Steroids were not used at any time, and antibiotics were employed only in those cases showing evidence of secondary infection.

Investigations

In retrospect it could be argued that more intensive investigations could have been performed on the early cases. That this was not done is an indication of the relatively mild degree of morbidity associated with the outbreak. When the disease was affecting the two to four years age group, one child was admitted to hospital for investigation. The choice of patient was an unfortunate one, the patient—a girl aged three years—was unco-operative as only a child of that age can be. However vesical fluid was obtained and the presence of inclusion bodies demonstrated. When an older and more co-operative patient arrived blood was taken for serology, stool samples were investigated and a Coxsackie A16 virus was isolated. All other investigations produced only negative evidence. The local German Public Health authorities were contacted but they professed no knowledge of the condition among the civilian community. A local German consultant paediatrician and local General Practitioners had seen very few cases. No common factor such as swimming baths was found and no cases were reported in nearby British Army garrisons despite warning to medical officers of the condition and requesting immediate notification of any cases or suspected cases seen.

Conclusion

The outbreak had shown a massive degree of susceptibility amongst the under twelve year olds, and a lesser but nevertheless demonstrable degree of susceptibility amongst young adults as shown by the 50 per cent infection rate amongst the school teaching staff. Whatever the method of spread of the organism responsible—and it would probably be respiratory or gastro-intestinal or both—it was expected that parents...
would catch the condition from their affected children and single soldiers catch the disease from married ones. As soon as single soldiers—who would be of a similar age group to the school teachers (twenty to twenty-five years old)—became infected a rate of spread similar in speed and scope to that of the school was predicted. In the event, none of these expectations occurred, the rapidity of the condition's arrival being exceeded only by that of its departure, leaving a very relieved medical service behind it. So far as limiting the spread of the condition, it can be honestly said that none of the preventive measures taken had any effect at all. Furthermore in retrospect it is indeed doubtful whether other possible measures could have had any effect.

It is thought that circumscribed Army communities are particularly susceptible to these types of explosive outbreaks and may cause considerable worry to relatively junior medical officers if they have not seen the condition before. If anything at all can be gained from this outbreak, it is that the vast majority of cases required only symptomatic treatment, are soon well again and, that there appears to be a degree of immunity in the adult population which is proof against all but the highest degree of infection.

Finally, in outbreaks of this sort where morbidity is low, the medical authorities should avoid succumbing to pressures for drastic actions which are probably unjustified. To misquote Kipling “You must keep your head when all around are losing theirs and blaming you.”

Medical Birthday Honours

We extend our very sincere congratulations to the following medical men whose names were included in the Birthday Honours List published on 13 June 1970. They have served the Corps, either in or out of uniform, in many and varied capacities.

**Barony**

Sir Max Rosenheim, K.B.E.

*C.B. (Civil Division)*

Dr. Charles Edward Gordon Smith.

*C.B.E. (Civil Division)*

Dr. William D’Auvergne Maycock.

**ACADEMIC ACHIEVEMENTS**

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<td>MAJOR W. GREEN, M.B., Ch.B., R.A.M.C.</td>
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