General Practice Observed

Erythema infectiosum: an outbreak of "slapped cheek" disease in north Devon

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Summary

An outbreak of erythema infectiosum (fifth disease; megalerythema epidemicum) which occurred in a small north Devon town (population 3600) during the spring of 1975 is reported.

All fifty-eight cases displayed the diagnostic "slapped cheek" appearance. Virological studies gave disappointingly negative results.

Introduction

Erythema infectiosum is an exanthematous communicable disease primarily affecting children. It usually occurs in localised epidemics during the spring. It causes few systemic upsets, is self-limiting but of long duration (up to three weeks), and the cardinal feature is a fiery-red confluent rash on the cheeks. The condition was first reported in Germany in 1889¹ and was first thought to be a form of rubella. It was soon recognised, however, as a separate condition and was treated as such in the first American report in 1905.² Most reports have come from the USA.³⁻⁵ The only British report^{6,7} concerned seven cases, so the epidemic reported here of 58 cases is of some interest. Each case was seen and documented by one of us.

Clinical features

Few prodromal symptoms were recorded. There were three incidents of sore throat, two of slight pyrexia, and one each of earache, nasal discharge, stiff neck with headache, and abdominal pain. In all other cases the rash was the first sign of illness. There was a fairly constant pattern in the development and disappearance of the rash. In all cases it was first noticed on the face, but in 15 (1 in 4 cases) there was also rubella-like rash on the trunk. The facial rash was a bright red erythematous area covering both cheeks. The forehead and circumoral areas were usually spared. The edge of the erythematous area was clearly marked with an irregular map-like outline, which was often raised and palpable.

The facial rash persisted for six to seven days. The trunk and arms

became affected on the second or third day and the buttocks and legs on the third to seventh days. The rash on the limbs tended to favour the skin over the extensor surfaces, had a lace-like appearance, and the erythematous margins were slightly raised and ran together to give dense patterns of circinate and serpentine shapes. The rash faded in the order in which it appeared, disappearing from the face in 7-14 days and receding from the limbs in a centripetal manner thereafter. In many patients the last sign was a lacey pattern across the knuckles. The centres of the erythematous areas assumed a dusky-blue appearance during the fading stage. There was a definite tendency for a transient recurrence of the rash during the next fortnight if the patient became hot.

There were few other features and most patients felt perfectly well. An occasional lymphadenopathy was noted; the spleen was palpable in two cases; some reported a mild pruritus; and two patients developed sore erythematous palms (one of these also had sore plantar surfaces). There was no exfoliation. Blood counts and erythrocyte sedimentation rates (ESR) were measured in eight cases. In six cases values were normal, one had a total white blood count of $13.3 \times 10^9/l$ ($13\,300/mm^3$), and the other an ESR of 23 mm. Those patients were subsequently found to have intercurrent parainfluenza and mycoplasma infections respectively.

Analysis of cases

Fifty-eight patients were seen—33 boys and 25 girls. The first case was recorded at the end of March and the peak of the epidemic was at the end of April and the beginning of May. The last new case appeared during the second week of June. The age distribution is summarised in the table. They were all children, most of them attending one of two primary schools serving the area. The disease lasted 15-23 days (average 19), and the incubation period, as judged in 10 cases in which the second sibling presumably caught the disease from the first, was 17-31 days (average 22).

Viral studies

Throat swabs from 37 patients and faeces from 24 were inoculated into monkey kidney, human diploid, and HEp2 cell cultures. All the cultures were observed twice weekly for three weeks. No cytopathic effect was seen and there was no haemadsorption of guinea-pig red cells by the monkey kidney cultures. Paired sera were collected from eight patients, and complement fixation tests were carried out against the following antigens: influenza viruses A and B, parainfluenza viruses 1 and 3, respiratory syncytial virus, adenovirus (group), psittacosis, *Rickettsia burnetii*, *Leptospira* (group), *Mycoplasma pneumoniae*, and rubella (haemagglutination inhibition test). Rising titres were observed in only two patients, one with parainfluenza virus 3, and one with *M. pneumoniae*.

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Number and age of patients

Age	..	..	..	..	..	<1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
No of cases	..	..	..	..	..	2	3	3	5	4	8	2	8	7	5	3	3		3	5		

Discussion

The nature of the epidemic suggests an infectious agent, presumably a virus, but, as in previous reports, it was not identified. We saw no babies under nine months and no adults with the disease, so it appears that erythema infectiosum is an infection by a common, contagious virus to which most people have developed immunity by adulthood, and from which babies are protected by transplacental endowment of maternal antibodies. Possibly many cases are seen but mis-diagnosed as either an allergic rash or another exanthem. We saw an example of this. A 7-year-old holidaymaker from Lancashire presented on arrival in our area at the end of the epidemic with a typical erythema infectiosum rash of several days' duration. En route she had been seen by two other doctors. One diagnosed scarlet fever and prescribed penicillin and the other an allergic rash and gave an antihistamine. Neither drug influenced the course of the disease.

Ager¹ quotes a female to male distribution of 3:2 but in our smaller series the ratio was reversed, while Edelson and Altman³ in a large series showed an equal sex distribution. In this epidemic the peak age incidence was 5-9 years, which agrees with that in other reports. Like Watts,^{6 7} we noted an incubation period of 22 days, but this is much longer than in other series: Ager *et al*⁵ suggest 7-11 days while Edelson and Altman³ suggest 4-14 days. The average duration of the disease in our series agrees with American findings but is at odds with the British figures given by Watts^{6 7} and Harries and Mitman.⁸

The question of teratogenicity has been raised by Ager *et al*.⁵ Their series included seven pregnant women but none had malformed babies. The rate of fetal abnormality in their area at that time was in fact lower than average. We will be taking particular note of infants born to mothers who were in the first trimester during the epidemic.

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Hospital Topics

Defects in sphygmomanometers: An important source of error in blood pressure recording

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Summary

Almost half the sphygmomanometers in a teaching hospital group had defects in the control valve which interfered with accurate blood-pressure reading. Ward staff should be taught to check sphygmomanometers regularly and replace control valves; time consumption and cost are low. The cuffs in general use in these hospitals, and of the standard size sold in Britain, had rubber bags which did not encircle the arm of more than half the patients on whom they were used. This deficiency causes over-reading of blood pressure in obese people. The size of error is uncertain but it should be avoided by adopting a cuff with a longer bag.

During the autumn of 1975 the Division of Medicine commissioned a study of diagnostic and therapeutic equipment on

the medical and geriatric wards of hospitals administered by the Newcastle Area Health Authority (Teaching). Defects in sphygmomanometers in use on these wards were so common that they cast doubt on the validity of blood pressure recordings on our patients. Since we believe that these defects are commonplace in British hospitals, and since the deficiencies can be remedied at very low cost, we report our findings.

Methods

Figure 1 illustrates the points that were checked on each sphygmomanometer. Our tests followed roughly the lines suggested by the Subcommittee on Blood Pressure Measurement of the American Heart Association¹ though we used a more stringent test for air leaks.

(a) The pump should have a competent non-return valve and no leaks.

(b) The control valve should allow the free passage of air without excessive muscular effort when the filter (fig 2) is clean. When closed it should hold the mercury at a constant level. When released it should allow a controlled fall of the mercury column. To test the valve we rolled the cuff in its own "tail," pumped to 200 mm Hg and waited 10 seconds, during which time the level should not fall more than 2 mm Hg. If a leak was detected the circuit was clamped in sections to find the site but in fact all such leaks were traced to control valves. We then slowly released the valve on four occasions. During at least two of these attempts it should be possible to control the rate of fall

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