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## FIFTH DISEASE IN CHILDREN LIVING IN BELÉM, BRAZIL

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### SUMMARY

Acute sera from two children suffering from an illness with an erythematous rash were positive for B 19 virus specific IgM antibody, as tested by a capture radioimmunoassay. The first patient, a two year old boy, presented with a cutaneous rash of six days duration, the second was a four year old girl, sister of the first patient, who was examined at the same time and had a three day history of cutaneous rash.

**KEY WORDS:** Fifth disease; B 19; Children; Brazil.

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### INTRODUCTION

Human parvovirus B 19 was first found in serum of largely symptomless blood donors<sup>6</sup> and has subsequently been associated with non-specific febrile illness<sup>18</sup>, aplastic crises in chronic haemolytic anaemias<sup>2, 7, 9, 17</sup> and acute arthritis<sup>15, 20</sup>. In addition, human parvovirus B 19 was shown to cause erythema infectiosum (EI) or "fifth disease", an acute exanthem of childhood<sup>4</sup>.

In Belém, Brazil, "rubella-like illnesses" are seen more frequently during the first six months of the year in children and occasionally in adults. Although routine investigations are carried out for evidence of rubella, measles, arbovirus infection and other exanthematous diseases, the aetiology remains unknown in a large proportion of cases. Because local facilities are not available, we have recently begun sending sera from such cases to England to be tested for the presence of specific IgM antibody against

B 19 virus. Our preliminary report deals with the first two cases of EI in Belém, Brazil, involving children under five years of age whose acute sera were positive for the presence of anti B 19 virus IgM antibodies.

### PATIENTS AND METHODS

Both patients lived in Belém City, north Brazil, which is located in the eastern Amazon at the convergence of Guamá and Pará rivers (10° 30' 20" S, 48° 39' 30" W). The climate is of tropical rain forest (Köppen) type, with a very heavy rainfall in the months of February, March and April. The annual mean temperature ranges from 24 to 28°C, and the relative air humidity is always high, about 80% throughout the year.

The two patients attended the Dermatology Unit of the Air Force Hospital of Belém in March

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1987, suffering from an illness with an erythematous rash. The first, a two year old boy, exhibited on clinical examination, a cutaneous eruption of six days duration. On examination there was a maculopapular rash on his face, anterior thorax and limbs; on his cheeks the erythema was diffuse, slightly raised and edematous; on his thorax and limbs a reticulate pattern was seen (Fig. 1). The second patient was a four year old girl, sister of the first patient, who was examined at the same time and had a three day history of a cutaneous rash. Except for minimal facial erythema, the eruption showed the same pattern as described for her brother. No constitutional symptoms were recorded in either case.

During the acute phase of the illness, serum samples, faecal specimens and throat swabs were taken from each child. One month later further serum samples were obtained from both children.

As facilities were not available in our laboratory, acute sera were sent to the Rubella Department, Regional Virus Laboratory, East Birmingham Hospital, Birmingham, UK, where tests were carried out for the presence of anti-B 19 virus IgM antibodies. The method used was a capture radioimmunoassay, MACRIA, as described by COHEN et al<sup>5</sup>.

By using standard serological procedures, paired serum samples were also tested for the presence of antibody for rubella, measles, infec-

tious mononucleosis, toxoplasmosis and arbovirus diseases. In addition, both faecal and throat swabs were inoculated onto monolayer cultures of Vero and Hep 2 cells and, intracerebrally, into suckling mice; both systems were observed daily during a period of two weeks for signs of viral infection.

## RESULTS

The acute sera from both children were positive for B 19 virus specific IgM antibody, confirming a recent B 19 virus infection. There was no evidence of rubella, measles, infectious mononucleosis, toxoplasmosis or arbovirus infection diseases in either child. One enterovirus isolate (probably coxsackie virus group A) was obtained by intracerebral mouse inoculation of a faecal suspension from one child.

## DISCUSSION

A broad spectrum of aetiological agents in the Amazon region have been found to be associated with exanthematous illness. Apart from the frequent occurrence of rubella, measles, infectious mononucleosis, toxoplasmosis and enteroviral infections, arboviruses may also give rise to febrile disease with erythematous maculopapular rash. With respect to the latter viral agents, epidemics of Oropouche and Mayaro fevers and Dengue (with rash being commonly seen) have been extensively reported in our region<sup>13, 14, 19</sup>.



Fig. 1 — Child (case 1) exhibiting maculopapular exanthem in the upper limbs with a reticulate pattern.

There have frequently been cases of "rube-lla-like" illnesses in which all the above mentioned tests are consistently negative, and their aetiology still remains to be elucidated, particularly in children. It is possible that B 19 virus is responsible for a proportion of such undiagnosed cases.

The two patients from Belém, Brazil, exhibited clinical features which were compatible to those generally described for erythema infectiosum<sup>3, 8, 16</sup>. Virological investigations of specimens obtained from these patients confirmed a recent B 19 virus infection as indicated by the presence of B 19 specific IgM antibody. We did isolate an enterovirus strain (probably coxsackie virus group A) from the faeces from one child but not from the other. This latter finding may not be of significance in the aetiology of the acute exanthematous disease in our cases, although such symptoms have been associated with the coxsackie virus group A<sup>11</sup>.

To our knowledge, this is the first time that both clinical and laboratory evidence have been obtained for the presence of "fifth disease" in Brazil. Based upon clinical evidence, one of us (MFRM) has recorded ten cases (Fig. 2) of erythema infectiosum in Belém from 1984 to March 1987 in both the Brazilian Air Force Hospital and his private clinic. All patients were children with ages ranging from two to eleven years exhibiting the classical "slapped cheek" appearance on face, an exanthem with reticulate pattern on limbs and/or trunk and, sometimes, low fever. With the exception of the two cases reported here, which were observed among brothers, the remaining eight had no known contact. Unfortu-

nately, sera from the remaining eight cases were not available for laboratory diagnosis of B 19 virus infection. Clinical evidence suggests that the disease occurs mainly during the first half of the year, when the highest rainfall and humidity are registered.

Experienced dermatologists in Belém suppose that the disease must be of recent introduction in our region, as cases like those reported here have not been seen in the past.

Our preliminary findings indicate that "fifth disease" occurs in the Amazon region with a possible seasonal pattern. Further studies should be conducted in order to evaluate the public health importance of this disease. It is important that it should not be misdiagnosed as an "allergy", thus leading to the unwise use of steroids: this was seen in one patient of our series whose period of illness had been prolonged as a result of cortico-steroid therapy.

Since parvovirus infection of pregnant animals can lead to severe fetal abnormalities and may cause spontaneous abortion, there is a growing interest in the possibility that human parvovirus might harm the fetus or newborn. Human parvovirus has been shown to cross the placenta

YEAR	NR. OF CASES
1984	1
1985	5
1986	1
1987	3
TOTAL	10

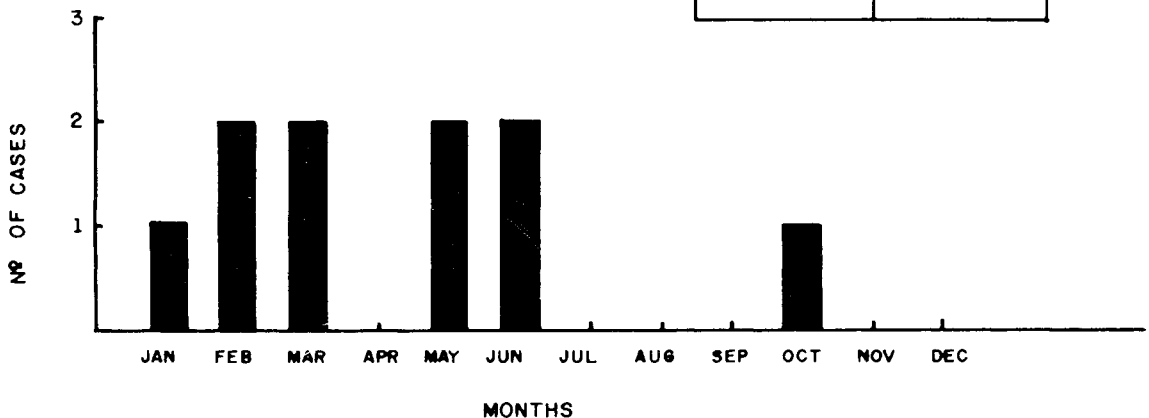


Fig. 2 — Monthly distribution of cases with typical clinical features of erythema infectiosum, Belém, Brazil, 1984 to 1987.

when infection occurs in pregnancy<sup>4, 10</sup> and it has been suggested that B 19 virus infection causes fetal loss either by spontaneous abortion or still-birth<sup>12</sup>. However, there is no evidence so far that implicates B 19 virus with congenital defects. Thus, human parvovirus B 19 infection should be considered as an alternative diagnosis to rubella, particularly in pregnant women where the latter infection may have serious consequences for the fetus.

## RESUMO

### Quinta doença em crianças habitantes de Belém, Brasil

Amostras de soro colhidas na fase aguda de doença exantemática, comentando duas crianças, revelaram-se positivas quanto à presença de IgM específica para o vírus B 19, através do método de rádio-imuno-ensaio por mecanismo de captura. O primeiro paciente, um menino de dois anos, apresentou erupção cutânea com seis dias de duração; o segundo foi uma menina de quatro anos de idade, irmã do primeiro paciente e que foi submetida a exame à mesma época em que se procedeu à avaliação clínica do irmão, e que exibia "rash" cutâneo que evoluía há três dias.

## ACKNOWLEDGEMENTS

We thank Drs. Ronaldo B. de Freitas and Yvone G. Mendes for their valuable cooperation. Thanks are also due to Mrs. Margarete F. Garcia for typing the manuscript.

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Recebido para publicação em 13/4/1989.