SHORT ARTICLE

The prevalence of antibody to human parvovirus B19 in England and Wales

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Summary. The prevalence of antibody to human parvovirus B19 (anti-B19 IgG) in England and Wales was measured by an antibody-capture radioimmunoassay. Over 2000 sera were examined; 1422 from the general population, 374 from unselected children admitted to hospital and 300 from women attending an antenatal clinic. Waning levels of maternally-derived antibody were found in infants under 1 year old. In children 1–5 years old, 5–15% had anti-B19 IgG and this rose to 50–60% in older children, young adults and women of child-bearing age. In older people, the prevalence of anti-B19 IgG increased with age, rising to more than 85% in those over 70 years old.

Introduction

The prevalence of antibody to human parvovirus B19 (anti-B19) in different age groups of the general population has been measured in Japan (Nunoue *et al.*, 1985), the USA (Anderson *et al.*, 1986) and West Germany (Schwarz *et al.*, 1987). In the United Kingdom, the prevalence has been analysed in children but not, except in outline, in adults (Cossart *et al.*, 1975; Edwards *et al.*, 1981). We now report on the prevalence of anti-B19 in all age groups of the general population in England and Wales. In the previous studies, the techniques used were counter-immuno-electrophoresis or enzyme-linked immunosorbent assay; we used antibody-capture radioimmunoassay (RIA) (Cohen *et al.*, 1983).

Materials and methods

Test sera

Three series of sera were examined:

- (1) *General population, England and Wales, 1985 and 1986.* Sera from 1422 unselected patients, collected for an influenza survey during the summers of 1985 (676 sera) and 1986 (746 sera), were obtained from the Public Health Laboratories in Taunton, Exeter, Birmingham, Nottingham, Leicester, Peterborough, Rhyl and Preston and were made available to us by Dr P. Chakraverty of the Virus Reference Laboratory.
- (2) *Children, London, 1982 and 1983.* Sera from 374 unselected children (< 14 years old) admitted to a North London hospital between March 1982 and September

1983 were kindly provided by Dr J. Reeve, Prince of Wales Hospital, London N15.

- (3) *Women of child-bearing age, London, 1985 and 1986.* Sera from 300 women attending an antenatal clinic in North West London, collected for influenza studies during November 1985 (150 sera) and March 1986 (150 sera), were made available by Dr P. Chakraverty.

Assay for antibody to human parvovirus

Immunoglobulin G class antibodies to human parvovirus B19 were detected by antibody-capture RIA (Cohen *et al.*, 1983).

Results

The prevalence of anti-B19 IgG in the different age groups of the population of England and Wales was very similar over the 2 years sampled, 1985 and 1986. The combined results for the 2 years are given in the table.

The prevalence of anti-B19 IgG in children in London during 1982–83 is shown in the figure.

Out of 150 antenatal sera tested for each year, 86 (57%) were anti-B19 IgG positive in 1985 and 75 (50%) in 1986. Overall, 161 out of 300 (53%) test sera gave positive results.

Discussion

The prevalence of anti-B19 IgG in infants under 1 year old reflects waning levels of maternally-derived antibody. The results from children show that active infection with B19 virus occurs fre-

Figure. Prevalence of anti-B19 IgG in children admitted to a North London hospital in 1982-83.

Table. Prevalence of antibody to parvovirus B19: 1985-86

Age (years)	Number of sera tested	Number (%) of positive results
<1	33	18 (54.5)
1-5	160	24 (15.0)
6-10	117	42 (35.9)
11-15	106	55 (51.9)
16-20	135	81 (60.0)
21-30	281	145 (51.6)
31-40	162	92 (56.8)
41-50	105	80 (76.2)
51-60	73	58 (79.5)
61-70	97	71 (73.2)
>71	153	133 (86.9)

quently in childhood, as originally demonstrated by Cossart *et al.* (1975) and Edwards *et al.* (1981) and later confirmed by Anderson *et al.* (1984) when investigating the aetiology of erythema infectiosum.

The frequency of antibody in children was lower in North London in 1982-83 than in the general population in 1985-86. It may be significant that most of the sera from the North London children were collected before May 1983 when there was a large outbreak of erythema infectiosum (Anderson *et al.*, 1984).

In adults aged 16-40 years, 50-60% had antibody. This is similar to the 61% prevalence previously found in blood donors by the same assay method (Cohen *et al.*, 1983). Almost half the women of child-bearing age are, therefore, susceptible to B19 virus with the attendant risk of fetal loss should infection occur in pregnancy (Carrington *et al.*, 1987). The prevalence of antibody rises after 40 years of age, suggesting continuing exposure to the virus in this age group.

The prevalence of anti-B19 antibody in this study is higher than in other surveys. This is probably attributable to the greater sensitivity of the RIA method.

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