



Correspondence

Seroepidemiology of parvovirus B19 among different age groups & pregnant women in India

Sir,

Parvovirus B19 (B19) can infect people of all ages, regions and social groups¹⁻³. Infection patterns in tropical and temperate countries, however, are variable^{4,5}. Clinical presentation also varies depending on age, immune status and presence of underlying diseases. In healthy children, B19 infection can present as erythema infectiosum, an exanthematous childhood illness or mild febrile illness¹. B19 infection can lead to serious consequences in 'at risk' groups, such as organ transplant recipients, thalassaemia and sickle cell anaemia patients and foetus *in utero*⁶. There are no population-based seroprevalence studies from India on parvovirus B19, although studies conducted among blood donors^{7,8} and hospital-based studies⁹ are reported. Seroprevalence data of B19 in pregnant women are also lacking from India. The present study was, therefore, undertaken to provide information on seroprevalence of B19 in general population and also among pregnant women.

A descriptive cross-sectional survey was carried out in Pune, India – retrospective for general population and prospective for antenatal women. Ethical approval for the study was received from the Institutional Human Ethics Committee, ICMR- National Institute of Virology, Pune. Anonymized, archived serum samples collected from hospital staff, general practitioners, school children and staff who were surveyed as the risk group for pandemic flu infection in Pune district, in 2009¹⁰, were tested for estimating community seroprevalence. For the present study, samples of 168 adults (20-60 yr), 350 adolescents (10 to <20 yr) and 150 children (<10 yr) were studied. Of the 1583 archived samples, 668 samples were selected by taking every alternate sample, maintaining male:female sex ratio (1.14:1 for children, 1.01:1 for adolescents and 1.02:1 for adults)¹¹. As samples of children were

limited, all samples were included. Samples selected included both seropositive and seronegative samples for pandemic influenza A (H1N1). For pregnant women, a sample size of 122 was calculated.

One hundred pregnant women were recruited during the study period (December 2014 - May 2015) at two hospitals (KEM Hospital and Bharati Hospital, Pune). Women up to 16 wk of gestation, attending antenatal clinic, who gave informed written consent were included in the study. Those with any history of immunosuppression or haemoglobinopathies were excluded. Anti-B19 IgG was determined using commercial kits – [SERION ELISA classic (virion\serion, Germany, and NovaLisa (NOVATEC IMMUNODIAGNOSTICA, GMBH, Germany)]. Five hundred and seven samples were tested by SERION ELISA classic and 261 by NovaLisa. IgM was estimated for equal number of age-matched IgG-positive (43) and IgG-negative (43) pregnant women.

Statistical analysis was performed using online software Openepi (<http://www.openepi.com/Proportion/Proportion.htm>). The presence of anti-B19 IgG antibodies was observed in 126/668 samples [18.86%, 95% confidence interval (CI) 16-22]. Seroprevalence of 6.7 per cent (4 of 59; 95% CI 2-16) in children below five years, 4.4 per cent (4 of 91; 95% CI 1-10) among 5-9 yr and 8.9 per cent (17 of 191; 95% CI 5-13) in 10-14 yr age group was noted. Older adolescents (15-19 yr) had a higher seroprevalence of 16.9 per cent (27 of 160; 95% CI 11-23). Seroprevalence of B19 increased significantly with age [Chi-square of trend=78.17 ($P<0.001$)]. Seroprevalence was similar in male and female children (M:F 3:1) and adolescents (M:F 0.92:1), but significantly ($P<0.05$) higher among adult females (M:F 0.68:1) (53%, 95% CI 42-63) as compared to males (35%, 95% CI 26-46) (Table).

Table. Age and gender distribution of seroprevalence of parvovirus B19

Age (yr)	Sex	n/Total	%Prevalence (95% CI)
<10	Male	6/80	7.5 (3.5, 15.4)
	Female	2/70	2.9 (1.7, 9.8)
	Both	8/150	5.33 (2.73-10.17)
10 to <20	Male	21/175	12.0 (7.9, 17.6)
	Female	23/175	13.1 (8.9, 18.9)
	Both	44/350	12.57 (9.5-16.46)
20 to 60	Male	30/85	35.3 (25.9, 45.8)
	Female	44/83	53.0 (42.3, 63.4)*
	Both	74/168	44.04 (36.76-51.6)

Among pregnant women, estimated seroprevalence of B19 was 43 per cent (43 of 100; 95% CI 33-52). Three seronegative women were IgM positive, of whom two had a recent history of fever with rash. All three women had normal outcome of pregnancy. Seroprevalence of B19 in pregnant women (43/100; 43%, 95% CI 33-52) and non-pregnant women (39/88; 44%, 95% CI 33-55) of reproductive age group (18-40 yr) was similar.

Our study showed lower seroprevalence of B19 antibodies among children and adolescents when compared with available data from India⁹. The pattern of seroprevalence in our study was consistent with that of developing Asian countries^{4,12} and other tropical countries^{5,13,14}, but lower than temperate countries^{3,15}. This suggests that age of acquisition of parvovirus B19 infection may be slightly higher in tropical countries as compared to temperate countries^{12,16}. Significantly higher seroprevalence was observed in adult females. This may be because adult women are more likely to be involved with the care of children and thus more likely to acquire infection from them¹⁷. More individuals need to be tested to confirm this finding. A previous study has reported evidence of B19 infection in women with bad obstetric history from India¹⁸.

In conclusion, our study provided baseline data from India, on seroprevalence of B19 in healthy pregnant women. As B19 infection is not vaccine preventable, the only means of prevention is a reinforcement of hygienic precautions. Awareness needs to be generated among physicians and population including pregnant women about this infection, its consequences and methods of prevention.

Acknowledgment

Authors thank the obstetric consultants at KEM and Bharti Hospital, Pune; Dr Gajanan N Sapkal and all study participants.

Conflicts of Interest: None.

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Received June 15, 2016

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