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# HUMAN PARVOVIRUS $B_{19}$ INFECTION AMONG EXANTHEMATIC DISEASES CLINICALLY DIAGNOSED AS MEASLES IN 2005 IN IRAN

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**Abstract: The clinical differential diagnosis of rashes is often difficult and misdiagnosis is not rare. Parvovirus B19(HPV-B19) is khown to cause erythema infectiosum, a childhood exanthematic disease and clinically can be confuse with other exanthematic diseases. In this study a total of 505 negative sera for measle and rubella, were collected during 2005 and tested for B19 specific IgM antibody by an enzyme immunoassay. B19 infection was confirmed in 73 cases (14.5%). The majority of positive cases were observed in 1-15 year age group. It is important to diagnose exanthematic diseases as B19 infection in Iran, since measles and rubella vaccination programs has done.**

**Keywords:** • Human Parvovirus $B_{19}$ • Mass vaccination • Exanthematic Disease.

## Introduction

Parvovirus $B_{19}$ was discovered fortuitously in 1975 by Cossart and colleagues in the serum of healthy blood donors (1) and is known to cause a spectrum of disease in humans (2). The most frequent clinical presentation of $B_{19}$ infection is the childhood exanthema, erythema infectiosum (fifth disease). This classically begins with a facial rash (slapped cheek) that spreads to the trunk and limbs (3). However the exanthema is highly variable, and may be misdiagnosed as rubella, measles and other exanthematic diseases, if laboratory investigation is not performed (4). After national measles and rubella vaccination campaign in Iran, all patients presenting with rash, high fever, and at least one of the following symptoms: cough, coryza or conjunctivitis, should be investigated for evidence of measles and rubella infection (5). Since $B_{19}$ virus has also been shown to cause exanthematic disease, in this study all negative sera for measles and rubella IgM antibody , tested for evidence of human Parvovirus $B_{19}$. This is the first study after measles and rubella mass vaccination, for the role of Parvovirus $B_{19}$ in exanthematic diseases in Iran.

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## Material and Methods

Patients' sera were taken from measles suspected cases by health care workers from the epidemiological surveillance in Iran. A total of 526 sera collected from 27 provinces of Iran in 2005 and sent to Department of Virology/School of Public Health and Institute of Health Research of Tehran University of Medical Sciences. With Each Samples, there was a questionnaire that included information such as date of rash occurrence, age, sex, province and vaccination status and these informations were analyzed to reach any relationship by using SPSS software, version 11.5.
All sera had been stored at -20°C until tested. Diagnosis of HPV- $B_{19}$ infection specific IgM in negative measles and rubella sera (505 samples) was done by a commercial ELISA Kit. ($B_{19}$–IgM ELISA, IBL, Germany).
Patients' ages ranged from neonates to more than 65 years. The chi squared test was used to compare proportions and $P<0.05$ was considered statistically significant.

## Results

505 negative measles and rubella cases divided in three age groups, less than one year, between 1 to 15 years and more than 15 years old and HPV- $B_{19}$ IgM antibody was positive in 73 cases (14.5%). (Table 1)

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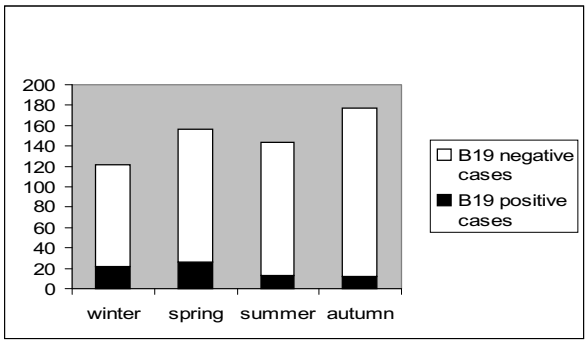
**Table 1:** Distribution of $B_{19}$ IgM antibody in rash illness by age groups and sex in Iran, 2005

| | $B_{19}$ IgM+ | | | $B_{19}$ IgM- | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sex / Age (years) | M | F | T | M | F | T | M | F | T | T% |
| <1 | 4 | 7 | 11 | 61 | 37 | 98 | 65 | 44 | 109 | 21.6 |
| 1-15 | 19 | 24 | 43 | 134 | 114 | 248 | 153 | 138 | 291 | 57.6 |
| >15 | 9 | 10 | 19 | 39 | 47 | 86 | 48 | 57 | 105 | 20.8 |
| T | 32 | 41 | 73 | 234 | 198 | 432 | 266 | 239 | 505 | 100% |

M:Male F:Female T:Total

2.2 % of $B_{19}$ cases were in less than one-year age group, 8.5 percent were in 1 to 15 years group and 3.8 percent were in more than 15 years age group. The seasonal distribution of $B_{19}$ had a peak occurrence in winter and springtime. (Figures 1)

**Fig.1:** Seasonal distribution of $B_{19}$ positive cases among exanthematic patients in Iran, 2005




## Discussion

As measles and rubella become rare, the relative importance of HPV- $B_{19}$ and other exanthematic diseases will increase (6).

73 (14.5%)out of 505 cases were positive for $B_{19}$ IgM antibody. This result showed a peak occurrence of $B_{19}$ in 1 to 15 year age group (8.5%). Speciffic relationship was not found between sex and prevalence of HPV- $B_{19}$ in this study as in other similar studies. Most of the studies has shown that the peak occurrence of HPV- $B_{19}$ is between the age of 1 to 15 year old as in this study. A study performed before measles and rubella mass vaccination, from 1069 patients with rash and fever, 9.8% of sera were positive for $B_{19}$ IgM antibody. In comparison with this study, the percentage of HPV-$B_{19}$ after mass vaccination has relatively increased (7). In another study, before mass vaccination, in Khoozestan Province of Iran, from 924 suspected measles cases, 1.88% was Positive for $B_{19}$ IgM. (8)

Percentage of this virus among other exanthematic viruses in other countries varies between 10 to 20 percent, for example the overall prevalence of $B_{19}$ IgM antibody in Saudi Arabia, 19% (9), in Sao Paulo province of Brazil, 17.6% (10), In Rio de Janeiro province in Brazil , 14.5% (11), and in Rotterdam province of Netherlands, 22% (12), were obtained. Diversity of $B_{19}$ IgM percentages in varying countries may be associated to differences in the temperature of storage of sera, methods of IgM assay, type of kits, and several other factors such as number of freeze–thawed of sera as well as possibility of the presence of an outbreak in the time of study.

$B_{19}$ had a peak occurrence in winter and springtime similar to seasonal distribution of measles and rubella (Figures 1).

In countries having MR mass vaccination programs, like Iran, control measles and rubella B19 infection is one of the main reasons for the rash onset and it is important for this countries to diagnose B19 infection from other exanthematic diseases.

In about 80% of the cases, the etiology of the rashes was unknown. It is well known that erythematous rashes occur in many common viral infections like HHV-6, EBV, entroviruses and also in allergies. So the etiology of these cases remains to be elucidated.

## References


1 Cossart YE, Field AM, Cant B, Widdows D, et al. Parvovirus – like Particles in human sera. Lancet 1975:1:72-3.

2 Heegaard ED, Brown KE. Human Parvovirus $B_{19}$. Clin microbial Rev. 2002; 15:485-505.

3 Anderson MJ, Jones SE, Fisher. Hoch SP, Lewis E. The human Parvovirus, The cause of erythema infectiousm (Fifth disease). [letter] Lancet 1983; 1:1378.

4 Shirley JA. Revill S, Cohen BJ, Buckley MM. Serological Study of rubella – like illnesses. J Med Virol. 1987; 21: 369-379.




[ Downloaded from journal.isv.org.ir on 2026-11-04 ]

[ DOI: 10.21859/isv.2.1.2.26 ]

**5** Ritta C.N, Marilda M, Elisabete O. Human Parvovirus $B_{19}$ infections Among Exanthematic Diseases Notified as Measles. revista da sociedade brasilian the medicina tropical. 1997; 30 (1): 15-20

**6** Oliveira SA, Camacho LA, Pereira AC. Clinical and Epidemiological Aspects of Human parvovirus $B_{19}$ Infection in an urban Area in Brazil. Mem inst Dswaldo. Cruz. 2002; 97:965-970.

**7** Hamkor R, Moosavi A, Saadatmand Z, et al. Epidemiologic Features of Viral Exanthematous Disease in Iran. 2 nd Iranian Congress on virology; 2004 Feb 13-15; Tehran, Iran.

**8** kelishadi M, Makvandi M, Samarbafzade A. The study of seroepidemiology of Measles, Rubella and Parvovirus $B_{19}$ in exanthematic patients in Khoozestan Province in 2002. 2nd Iranian Congress on virology; 2004 Feb B-15; Tehran, Iran.

**9** Al-Fragh AR, Bahakim H, kidess E, Ramias. IgG and IgM antibodies to human Parvovirus $B_{19}$ in the serum of patients with a clinical diagnosis of infection with the virus and in the general population of Saudi Arabia. J Infect. 1993; 27 (1) : 51-5.

**10** Oliveira M, Curti S, Figueiredo C. et al. Rash after measles vaccination: laboratory analysis of cases reported in Sao Paulo, Brazil. Rev Saude Publica. 2002; 36(2): 155-9.

**11** Mendonca MCL, Riberio SB, Couceiro JNSS, Von Hubinger MG. Parvovirus $B_{19}$ infections in state of Rio de Janeiro , Brazil: 526 Sera analyzed by IgM- enzyme – linked immunosorbend Assay and PCR. Men inst Oswaldo crus. 2005; 100 (8): 847-852.

**12** Ronveaux O, Bosman A, Reintjes R, Spaendonk M. Descriptive epidemiology of exanthemas in the Rotterdam region January 1997 to June 1998. Euro Surveill. 1998; 3(12): 122-4.


[ Downloaded from journal.isv.org.ir on 2026-11-04 ]

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