

High Seroprevalence of Parvovirus B19 in blood donors of the Zurich region

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• Background

Transmission of Parvovirus B19 (PB19) by blood transfusion is life-threatening for immunocompromised patients. Immunity against PB19 infection in recipients of blood products may protect from transfusion-transmitted PB19 (ttPB19) infection. For Switzerland, data on PB19 prevalence in blood donors (BD) are lacking.

• Objectives

Seroprevalence of anti-PB19 antibodies in BD was determined in a representative fraction of BD of the Zurich area. Testing for PB19 DNA in BD's EDTA-plasma was routinely assessed by PCR in pools of 96. IgG positive donors were further analysed for age group and provenience of donor (rural versus urban).

• Methods

Archived samples of donations provided between 01.03.2017 and 11.10.2017 were chosen randomly and tested retrospectively for anti-PB19 IgG against capsid protein VP1 and VP2 using a commercial test (RecomWell ELISA, Mikrogen GmbH, Neuried, Germany) according to the recommendations of the manufacturer. PCR for PB19 was performed on cobas 6800 in a duplex format with HAV (DPx, Roche) in pools of 96. DNA titre of $\geq 10^2$ IU/ml was considered "DNA positive" and the respective pool was resolved by single sample testing to identify the PB19-DNA positive donation. Resulting DNA titres of PB19 in a single sample had a minimal concentration of $\geq 10^4$ IU/ml. IgG data were correlated with PB19-NAT data of the respective donations extracted from donor's data file. The software SPSS Statistics 17.0 was used for descriptive analysis of the data.

• Results

Of 1549 donors tested for anti-PB19 IgG there were 1197 (77.3%) found positive. Figure 1 shows a significant increase of IgG-positive donors with increasing age (< 30years: 72.4%, > 60 years: 82.3%, $p=0.007$). In Figure 2 there seems to be a higher IgG positive rate in rural donors as compared to donors in urban area (82.3% versus 78.6%, resp., $p=0.021$). There is some influence of age, which is not conclusive (Date not shown). Routine pool testing for PB19 DNA was negative for all BD's assessed in the study, suggesting that healthy BDs carrying PB19 virus titer $>10^6$ IU/ml are rarely expected.

• Results

Figure 1: Age distribution of PB19 Serology Percentage

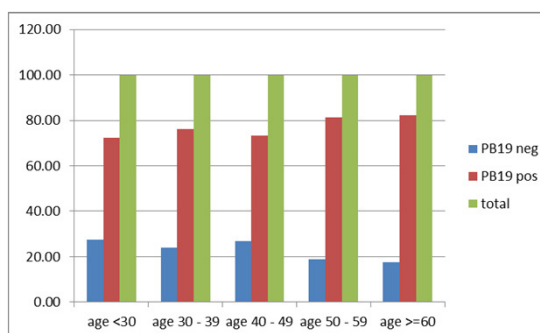


Figure 2: Distribution of PB19 Serology Results in Urban and Rural Areas

	Urban Area		Rural Area	
	Absolute Numbers	%	Absolute Numbers	%
PB19 serology neg	57	31.7	270	21.4
PB19 serology pos	123	68.3	994	78.6
total	180	100	1264	100

• Conclusions

Parvovirus B19 seroprevalence of donors in the Zürich area is rather high and increasing with age of BD. Even higher rates of PB19-IgG positive BD are possibly found in rural areas. From such a high rate of PB19 positive BD's can be inferred, that most of the Swiss patients will also be PB19 IgG positive. Receiving blood products with low titres of Parvovirus B19, Swiss patients should therefore be protected from infection. As a precautionary measure however, we recommend to use "PB19 DNA negative" blood products for immune compromised patients and during pregnancy. Seroprevalence in Switzerland seems to be in accordance with other European countries. As expected, positive serology increases steadily with age group. There is no overt reason for a higher seroprevalence in rural areas.