

# DISTRIBUTION OF HLA SPECIFICITIES IN IGA DEFICIENT (IgA-D) BLOOD DONORS RESIDENT IN WALES



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## Introduction

Severe anaphylactic reactions to blood transfusion in patients with IgA antibodies can be avoided by the transfusion of blood and blood products from IgA-D donors.

During a search for IgA-D subjects we screened 54,465 random blood donations using an automated passive haemagglutination inhibition assay (1).

A total of 220 blood donations (1 in 247) were identified as being IgA-D by the automated technique and confirmed by manual testing.

### Haemagglutination technique for IgA deficiency

*Preparation of IgA-sensitized tanned cells.* Washed (using phosphate buffered saline at pH 7.2) packed human group Orr red blood cells (RBC) incubated with 0.025mg/ml tannic acid for 15 min at 37°C.

The washed tanned RBCs incubated with 0.25mg/ml human IgA protein (Sigma) for 30 min at 37°C.

Washed IgA-sensitized RBC suspended in 0.6% bovine serum albumin.

*IgA Testing.* Donor plasma diluted in 10 volumes of a 1/4000 dilution of anti-IgA (Dako).

Aliquot of plasma/IgA antibody mixture incubated with an equal volume of IgA-sensitized cells for 60 min at ambient temperature.

*Interpretation.* Haemagglutination - indicates a low or absent level of donor plasma IgA (IgA antibody not neutralised by donor plasma IgA).

Inhibition of haemagglutination - indicates a normal level of donor IgA (anti-IgA neutralised by donor plasma IgA).

## HLA associations in IgA-D

Selective IgA deficiency has been associated with various HLA genes. In particular, DRB1\*03 and DQB1\*02 are often over represented in IgA-D subjects while DRB1\*1501 and DQB1\*0602 may be under represented.

To evaluate the possible influence of HLA in our blood donors with IgA-D HLA-A,B typing (by serology and/or PCR-SSP) and DR,DQ typing (by PCR-SSP) was performed on 83 and 49 of the IgA-D blood donors, respectively.

The distribution of HLA "specificities" was compared to that of 1,798 comprehensively HLA typed random blood donors on the Welsh Bone Marrow Donor Registry (2) using Woolf-Haldane analysis. P-values were corrected (p corr) for the 50 comparisons by Edwards' method.

## Results

### *Distribution of HLA-A, B, DR, DQ specificities*

Four HLA specificities were significantly increased (p uncorrected < 0.05) in the IgA-D group compared to the control population:

- HLA-A32 (13.3% in the IgA-D group versus 6.9% in the control population, relative risk (RR) 2.1)
- HLA-B27 (15.7% vrs 8.1%, RR 2.2)
- HLA-B37 (7.2% vrs 2.7%, RR 3.0)
- HLA-DR10 (6.1% vrs 2.7%, RR 6.7)

However, all four frequency disturbances were non-significant after correction (p corr > 0.05).

### *Distribution of HLA "haplotypes" associated with IgA-D*

There was no significant difference (p uncorrected > 0.05) between the distribution of likely HLA-A1, B8, DR3 haplotypes and DR15, DQ6 haplotypes in the IgA-D subjects and the control population (Table 1).

**Table 1.**  
**Frequency of HLA-A1, B8, DR3 and DR15, DQ6 haplotypes**

Likely haplotype	Haplotype frequency (%)		p-value (uncorrected)
	IgA-D	Controls	
HLA-A1, B8, DR3	9.2	10.5	> 0.05
HLA-DR15, DQ6	19.4	13.6	> 0.05

## Summary

Approximately 1:250 Welsh blood donations have a low or absent level of serum IgA as determined by our automated passive haemagglutination inhibition assay.

No association was identified between HLA-A,B,DR or DQ specificity or likely HLA-A1,B8,DR3 or DR15,DQ6 haplotype and IgA-D in blood donors residing in Wales.

## References

1. Mohabir & Rees (1995) Transfusion Medicine, **5**, 275.
2. Darke et al. (1998) Exp Clin Immunogenet, **15**, 69.