

HLA-A, B, DR AND DQ GENE AND HAPLOTYPE FREQUENCIES IN SRI LANKA



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High frequency three-locus haplotypes, with significant Δ values (corrected $p < 0.001$), included:

Introduction

As part of a study of the clinical effects of commercial salt iodination in Sri Lanka (formerly Ceylon) we determined the HLA-A, B, DR and DQ phenotypes of a control population of 110 healthy, random unrelated pregnant Sri Lankan women. Most (94.6%) were Sinhalese, the peoples that originated from Northern India and now form the majority of the population of Sri Lanka.

Methods

HLA typing

HLA-A, B, DRB1/3/4/5 and DQB1 typing, essentially at the "split specificity" level, was performed by our standard PCR-SSP technique.

Population genetics analysis

This included the calculation of: phenotype frequencies; gene frequencies (derived from the haplotype counting method of maximum likelihood); the validity of Hardy-Weinberg equilibrium and homozygosity analysis; two- and three-locus haplotype frequencies (HF) by maximum likelihood and linkage disequilibrium (Δ) values and their significance.

Results

Phenotype and gene frequencies

13 different HLA-A, 25 -B, 12 -DR and 7 -DQ "specificities" were identified. Hardy-Weinberg and homozygosity analysis showed a good fit to that expected for all four loci (all p -values > 0.32). Table 1 shows the phenotype and gene frequency distribution.

Two- and three-locus linkage disequilibrium

The highest two-locus haplotype frequencies (HF) with significantly positive Δ values (corrected $p < 0.01$) included:

Haplotype	HF	Δ value
A33 B58	0.114	0.076
B44 DR7	0.085	0.060
B75 DR12	0.027	0.025
B37 DR10	0.018	0.017
DR15 DQ6	0.176	0.117
DR7 DQ2	0.110	0.072
DR7 DQ9	0.105	0.082

Linkage disequilibrium between DR and DQ was generally comparable to Northern European Caucasoid populations with the exception of an apparent high incidence of DR15/DQ5 (4.09% of haplotypes) and DR4/DQ4 (0.91%) haplotypes.

Haplotype	HF	Δ value
A33 B44 DR7	0.065	0.058
A1 B57 DR7	0.030	0.027
A33 B58 DR13	0.025	0.021
B44 DR7 DQ2	0.079	0.075
B57 DR7 DQ9	0.049	0.047
B7 DR15 DQ6	0.042	0.037

Table 1. HLA-A, B, DR and DQ frequencies

HLA	Phenotype freq. (%)	Gene freq.	HLA	Phenotype freq. (%)	Gene freq.
A1	25.5	0.13178	B49	0.9	0.00455
A2	22.7	0.12265	B50	0.9	0.00455
A3	8.2	0.04091	B55	5.5	0.02727
A24	29.1	0.15448	B56	4.5	0.02273
A26	12.7	0.06811	B35	22.7	0.11817
A11	20.9	0.11355	B37	3.6	0.01818
A29	0.9	0.00455	B60	6.4	0.03182
A30	2.7	0.01364	B61	12.7	0.06364
A31	3.6	0.01818	B70	3.6	0.01818
A32	4.5	0.02273			
A33	41.8	0.24982	DR1	4.5	0.02273
A74	0.9	0.00455	DR15	40.9	0.22234
A28	10.9	0.05455	DR16	2.7	0.01364
			DR17	11.8	0.05909
B51	6.4	0.03182	DR4	9.1	0.05380
B52	9.1	0.04545	DR11	12.7	0.06364
B7	15.5	0.08181	DR12	12.7	0.06364
B8	3.6	0.01818	DR13	17.3	0.09502
B44	22.7	0.11364	DR14	18.2	0.09958
B13	7.3	0.03636	DR7	40.9	0.22234
B14	0.9	0.00455	DR8	4.5	0.02273
B62	6.4	0.03634	DR10	11.8	0.05909
B75	7.3	0.03636			
B76	1.8	0.00909	DQ5	39.1	0.21889
B77	0.9	0.00455	DQ6	45.5	0.26590
B38	1.8	0.00909	DQ2	30.9	0.16692
B39	3.6	0.01818	DQ7	29.1	0.15145
B57	15.5	0.08181	DQ8	5.5	0.02978
B58	27.3	0.14998	DQ9	20.0	0.10521
B18	2.7	0.01364	DQ4	4.5	0.02273

Comment

This analysis has provided the necessary initial information to serve as a platform for the further study of HLA in this interesting Sri Lankan population.

Data tables are available from CD.