**Supplementary Table 1: Historical RBC Alloantibodies at Study Entry and Exit**

|  |  |  |  |
| --- | --- | --- | --- |
| **Blood Group** | **Antigen** | **Alloantibody Frequency at Study Entry** | **Alloantibody Frequency at Study Exit** |
| RH | C | 6 (6.7%) | 6 (6.7%) |
|  | E | 4 (4.4%) | 4 (4.4%) |
|  | e\* | 3 (3.3%) | 4 (4.4%)\*\* |
|  | Goa | 3 (3.3%) | 4 (4.4%)\*\* |
|  | f | 1 (1.1%) | 1 (1.1%) |
|  | V | 1 (1.1%) | 1 (1.1%) |
|  | VS | 1 (1.1%) | 1 (1.1%) |
|  | Cw | 1 (1.1%) | 1 (1.1%) |
| Kell | K | 1 (1.1%) | 1 (1.1%) |
|  | Kpa | 5 (5.6%) | 5 (5.6%) |
|  | Jsa | 3 (3.3%) | 6 (6.7%)\*\* |
| Duffy | Fya | 1 (1.1%) | 1 (1.1%) |
|  | Fy3 | 1 (1.1%) | 1 (1.1%) |
| Kidd | Jkb | 1 (1.1%) | 1 (1.1%) |
| MNS | M | 2 (2.2%) | 2 (2.2%) |
|  | S | 2 (2.2%) | 2 (2.2%) |
| Lutheran | Lua | 3 (3.3%) | 3 (3.3%) |
| Knops | Knops | 1 (1.1%) | 1 (1.1%) |
| Lewis | Leb | 1 (1.1%) | 1 (1.1%) |
| Other | Wra | 0 | 1 (1.1%)† |
|  | Unspecified | n/a‡ | 1 (1.1%)† |

\*Includes anti-hrB and antibodies with e-like specificity in patients with partial e expression.

†indicates new alloantibody detection during the study period.

‡Past antibodies of undetermined specificity were not quantified for this study

**Supplemental Table 2:** Frequency of indeterminate antigen typing by HEA-LR in 2035 RBC units.

|  |  |
| --- | --- |
| **Antigen** | **Indeterminate Call** |
| V | n/a |
| VS | n/a |
| c | 23 (1.1%) |
| C\_BIG | 96 (4.7%) |
| e | 2 (0.1%) |
| E | 4 (0.2%) |
| K | 8 (0.4%) |
| k | 4 (0.2%) |
| Kpa | 7 (0.3%) |
| Kpb | 6 (0.3%) |
| Jsa | 13 (0.6%) |
| Jsb | 6 (0.3%) |
| Jka | 42 (2.1%) |
| Jkb | 55 (2.7%) |
| Fya | 58 (2.9%) |
| Fyb | 84 (4.1%) |
| M | 15 (0.7%) |
| N | 39 (1.9%) |
| S | 62 (3.0%) |
| s | 73 (3.6%) |
| Lua | 67 (3.3%) |
| Lub | 35 (1.7%) |
| Dia | 26 (1.3%) |
| Dib | 11 (0.5%) |
| Coa | 48 (2.4%) |
| Cob | 58 (2.9%) |
| Doa | 90 (4.4%) |
| Dob | 88 (4.3%) |
| Joa | 29 (1.4%) |
| Hy | 21 (1.0%) |
| LWa | 13 (0.6%) |
| LWb | 23 (1.1%) |
| Sc1 | 59 (2.9%) |
| Sc2 | 61 (3.0%) |

**Supplementary Table 3. *RHCE* variant genotype classification in SCA patients**

|  |  |  |  |
| --- | --- | --- | --- |
| **RHCE Genotype** | | **Frequency** | **Frequency of RhCE antibody** |
| **Allele 1** | **Allele 2** |  |  |
| ***Partial e*** | | **26 (28.9%)** | **8 (30.8%)** |
| ce(48C) | ce(48C) | 6 | 0 |
| ce(48C) | ce(48C, 733G) | 2 | 1 (anti-C) |
| ce(48C, 733G) | ce(48C, 733G) | 1 | 0 |
| ce(733G) | ce(733G) | 3 | 3 (anti-e) |
| ce(48C) | ceTI, type 1 | 3 | 1 (anti-E) |
| ce(733G) | ceMO | 1 | 1 (anti-E) |
| cE | ce(48C) | 4 | 1 (anti-E) |
| cE | ceMO | 1 | 0 |
| ce(48C) | ceMO | 2 | 0 |
| ce(48C) | ceCF | 1 | 2 (1 anti-C, 1 anti-e)‡ |
| ceTI / ce(48C, 733G,744C) , or  ce(948C) / ce(48C,105T,733G,744C,1025T)\* | | 1 | 0 |
| cE | ceJAL | 1 | 0 |
| ***Partial e and partial C*** | | **3 (3.3%)** | **0 (0%)** |
| ce(48C) | ce(48C, 733G, 1006T)† | 3 | 0 |
| ***Partial C*** | | **1 (1.1%)** | **0 (0%)** |
| ce | ce(48C, 733G, 1006T) † |  |  |
| ***Partial c*** | | **1 (1.1%)** | **0 (0%)** |
| Ce | ceTI, type 1 |  |  |
| ***Possible Partial e: unknown cis/trans position***‡ | | **2 (2.2%)** | **0 (0%)** |
| ce/ ce(48C, 733G) , or ce(48C) / ce(733G) | | 2 | 0 |
| ***Conventional + RHCE variant*** | | **37 (41.1%)** | **2 (5.4%)** |
| ce | ce(48C, 733G) | 9 | 1 (anti-C) |
| ce | ce(733G) | 8 | 1 (anti-E) |
| ce | ce(48C) | 7 | 0 |
| ce | ceTI (type 1) | 2 | 0 |
| ce | ce(48C, 733G, 1006T) | 1 | 0 |
| Ce | ce(48C) | 6 | 0 |
| Ce | ce(48C, 733G) | 2 | 0 |
| Ce | ce(48C, 733G, 1006T) | 1 | 0 |
| ***Conventional RHCE*** | | **21 (23.3%)** | **5 (23.8%)** |
| ce | ce | 7 | 1 (anti-C) |
| ce | Ce | 6 | 1 (anti-Cw) |
| ce | cE | 4 | 3 (2 anti-C, 1 anti-e) |
| Ce | cE | 3 | 0 |
| cE | cE | 1 | 0 |

\*Note: 105T is not tested on the RHCE BeadChip Assay; unknown if this also encodes partial c. †Patient *RHD* haplotype DIIIa-CE(4-7)-D (r’S). ‡When cis/trans position was unknown, patients were not considered to have potential mismatches at RH antigens. ceTI type 1 = ce(48C, 1025T); ceMO = ce(48C, 667T); ceCF = ce(48C, 697G, 733G); ceJAL = ce(340T, 733G)

‡1 anti-e occurred during the study time period in the same patient with a historical anti-C.

**Supplementary Table 4. RHD genotype classification in SCA patients**

|  |  |  |  |
| --- | --- | --- | --- |
| **RHD Genotype** | | **Frequency** | **Frequency of RhD antibody** |
| **Allele 1** | **Allele 2** |  |  |
| ***Partial RHD+*** | | **4 (4.4%)** | **0 (0%)** |
| DIVa-2 | RHD psi | 1 | 0 |
| DIIIa-CE(4-7)-D | DIIIa-CE(4-7)-D | 1 | 0 |
| DAU-5 (or DV type 1) | RHD deletion | 1 | 0 |
| DAU3 | DAU3 vs. RhD deletion\* | 1 | 0 |
| ***Partial RHD-*** | | **1 (1.1%)** | **0 (0%)** |
| DIII type 5 (DIIIa) | DIII type 5 (DIIIa) vs. RhD deletion\* | 1 | 0 |
| ***Weak D+*** | | **1 (1.1%)** | **0 (0%)** |
| Weak D type 1 | DIVa-2 | 1 | 0 |
| ***RHD-*** | | **3 (3.3%)** | **0 (0%)** |
| RHD deletion | RHD deletion | 3 | 0 |
| ***Conventional / Variant RHD*** | | **18 (20.0%)** | **2 (11.1%)** |
| Conventional D | DIIIa-CE(4-7)-D | 5 | 0 |
| Conventional D | RHD psi | 5 | 2 (1 auto anti-D; 1 anti-Goa)† |
| Conventional D | DAU-3 | 2 | 0 |
| Conventional D | DAU-5 (or DV type 1) | 2 | 0 |
| Conventional D | DIVa | 1 | 0 |
| Conventional D | DIVa-2 | 1 | 0 |
| Conventional D | DIII type 5 (DIIIa) | 1 | 0 |
| Conventional D | Weak D type 4.0 or 4.3 | 1 | 0 |
| ***Conventional RHD*** | |  |  |
| Conventional D | Conventional D | **63 (70.0%)** | **6 (9.5%)**  (3 anti-Goa‡, 2 auto anti-D, 1 anti-f) |

\*RHD BeadChip assay does not allow for the distinction between homozygous vs. hemizygous gene mutations since it does not test for the hybrid Rhesus box associated with the full RHD deletion.

†Anti-D warm autoantibody and anti-Goa alloantibody occurred in the same patient, detected at different times (4 years apart)

‡1 anti-Goa was first detected during the study period.