The incidence of V (Rh10) and Jsa (K6) in the contemporary African American blood donor

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Following an apparent increase in the number of patients with anti-V and/or anti-Jsa who required V- and/or Js(a-) red cell units, red cells from African American blood donors negative for C, E, S, K, Fya, Fyb, and Jkb were typed for V and Js(a) over a 2-year period. Of the 438 donors typed for V and Jsa, 168 (38.36%) were V+ and 71 (16.44%) were Js(a+). The incidence of V (Rh10) was higher than that reported in previous studies, but no change was seen in the incidence of Jsa (K6). Immunohematology 1994;10:136-138.

Chronically transfused patients, especially those with sickle cell disease (SCD) and cancer, receive multiple, repeated antigenic stimuli. The probability that these patients will produce alloantibodies is far greater than for those who have a single or short-term transfusion episode, during surgery or following acute trauma.1,2

Many reports have been published on the incidence of alloantibodies in patients with SCD.3-12 These patients and the African American donor population often have similar red cell phenotypes, i.e., their red cells frequently type negative for some or all of the following antigens: C, E, S, K, Fya, Fyb, and Jkb.13 In contrast, red cells from the Caucasian donor population are commonly positive for C, S, Fya, Fyb, and Jkb.13 Caucasians are also three times more likely to be positive for K.13

Since the ratio of African American blood donors to Caucasian blood donors in the United States is small,3,9,11 it is likely that multitransfused African American patients will be challenged with foreign red cell antigens on at least one occasion.3,14,15 Patients with SCD who receive multiple units from random donors are exposed to and may produce alloantibodies to all of the red cell antigens that they lack.3 If such alloantibodies form, serologically compatible blood may be found only among African Americans. This, in turn, presents another problem. The V (Rh10) and Jsa (K6) antigens, absent in Caucasians, are prevalent in African Americans. In African Americans, the V antigen has a reported incidence of 27 percent16 and the Jsa antigen has an incidence of 15.87 percent.17 Therefore, transfusion-dependent V- and/or Js(a-) SCD patients with multiple antibodies that necessitate transfusion of blood from African Americans are more likely to produce antibodies to V, Jsa, or both.

In 1990 the American Red Cross Rare Donor Registry (RDR) assisted in supplying red blood cell units to 24 patients with SCD who had antibodies to multiple common antigens (D. Malamut, personal communication, July 1994). In addition, 13 of those patients also had anti-V or anti-Jsa. Two patients had antibodies to both. Thus, the SCD patients with anti-V and/or Js(a) constituted over 50 percent of the requests received by the American Red Cross RDR for red blood cell units; this statistic gives an indication of the demand for V- and/or Js(a-) blood from African American donors.

In order to meet this increasing demand, the American Red Cross National Reference Laboratory for Blood Group Serology (NRLBGS), in conjunction with the American Red Cross RDR and several American Red Cross regions, has been typing red cells from group O, African American blood donors negative for C, E, S, K, Fya, Fyb, and Jkb antigens for V and Jsa.

Materials and Methods

The following American Red Cross regions submitted donor segments from group O donors negative for C, E, S, K, Fya, Fyb, and Jkb antigens to the NRLBGS: Atlanta (now Southern Region), Carolina Lowcountry (now Southeast Region—Charleston Location), Carolinas, Greater Chesapeake and Potomac, Gulf Coast, and Heart of America.

Red cells from each donor were typed with at least two sources of anti-V and -Jsa. These reagents are rarely available commercially; since potent, reliable, contaminant-free sera are difficult to obtain. Following requests made to several American Red Cross regions, and with the help of the American Red Cross Reagent Production Laboratory, the NRLBGS was able to obtain sufficient antisera to institute this testing protocol. In order to conserve
the rare antisera, all testing was performed by a capillary-
indirect antiglobulin test.18

Upon completion of testing, a report was sent to the
submitting region and the results were added to the
computerized RDR record of each donor. Approximately
30 new donors are submitted each month to
NRLBGS for typing and subsequent entry into the RDR.

Results

As of December 1992, 438 donors (negative for C, E,
S, K, Fya, Fyb, and Jkβ) had been tested for V and 432 for
Jsb. Of 438 donors tested for V, 38.36 percent were posi-
tive, and of 432 donors tested for Jsb, 16.44 percent were
positive (Table 1).

Table 1. V and Jsb typing results for >400 African American blood donors

<table>
<thead>
<tr>
<th>Antigen</th>
<th>Number tested</th>
<th>Positive</th>
<th>Negative</th>
<th>Positive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>438</td>
<td>168</td>
<td>270</td>
<td>38.36</td>
</tr>
<tr>
<td>Jsb</td>
<td>432</td>
<td>71</td>
<td>561</td>
<td>16.44</td>
</tr>
</tbody>
</table>

Discussion

Our results indicate that the prevalence of the V anti-
gen in our study of African American blood donors, as
expected, is different from published studies that includ-
ed African Americans who were positive for C and E anti-
gens (R1, R2, and r' genes). This was expected, since
V is known to be made by r and Rr genes, which do not
produce C and E antigens.13 For example, we found an
incidence of 38.36 percent for V, as opposed to 27 per-
cent reported by DeNatale in 1955.10 However, the inci-
dence of Jsb in our study (16.44%) was comparable to a
previous study (15.87%).15 (Table 1).

This study points out that it may be prudent to pheno-
type African American patients for the V and Jsb anti-
gens, especially those whose treatment may include
chronic transfusion support. If the red cells are positive
for one or both antigens, compatible blood will be easi-
er to locate among African American donors. However,
testing for V and Jsb antigens may not be practical
because of the problem of finding good sources of typingsera. Unless adequate supplies of suitable anti-V
(high-titer) and anti-Jsb are available, this situation is like-
ly to continue.

Approximately 11 percent of African Americans will
be negative for C, E, S, K, Fya, Fyb, and Jkβ13,19,20 and
therefore may be suitable donors for patients with simi-
lar phenotypes who have made multiple antibodies to
common red cell antigens. When the incidence of the V
and/or Jsb antigens is also included in the calculations,
the number of donors suitable for some of the patients
is further reduced.

Entry of typing results, including V and Jsb antigens,
into a rare blood donor database would allow for a more
efficient search for those patients who have anti-V
and/or Jsb who require transfusions from R0 or r African
Americans. Location of typed units would be faster and
more efficient, and these factors contribute to better
care for such patients.

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