Mailing of a sickle cell disease educational packet increases blood donors within an African American community

Cynthia L. Price, Jessica H. Boyd, André R. Watkins, Fay Fleming, and Michael R. DeBaun

**BACKGROUND:** Low blood donor rates among African American persons are recognized; however, few strategies exist to increase these numbers.

**STUDY DESIGN AND METHODS:** A 1-year, prospective, ecologic study performed before and after an educational intervention designed to test the hypothesis that increased education about the importance of blood donation for children with sickle cell disease (SCD) would result in an increase in total blood donors among African American persons.

**RESULTS:** Approximately 5000 videos were mailed to 50 percent of the households in a zip code where 98 percent of the residents are African American. In the first 6-month interval after mailing the video packet, there was a 75 percent (217 vs. 124; \( p = 0.05 \)) increase in the total number of presenting donors and a 64 percent (126 vs. 77; \( p = 0.02 \)) increase in the total number of first-time donors from the same 6-month period in the previous year. During the second 6-month interval, the total number of first-time donors declined. No significant increase in donor activity was noted during the two 6-month periods after the intervention in the surrounding zip codes.

**CONCLUSION:** A mass mailing directed toward educating African American persons about the importance of blood donation for children with SCD may increase the number of total African American donors.

**ABBREVIATION:** SCD = sickle cell disease.
cantly decrease the rate of alloimmunization among children with SCD who receive regularly scheduled blood transfusion.9 This prospective, multicenter study by Vichinsky and coworkers10 demonstrated a drop in the alloimmunization rate from 3 to 0.5 percent per unit of blood. This represents a relative risk reduction of 83 percent, in patients with SCD receiving C, E, and Kell antigen matched blood when compared to alloimmunization rates in previously reported studies.

Despite the complications associated with SCD and the prevalence of the disease within the African American community, limited knowledge exists about this disease within the African American community. Our group conducted a random-digit dialed telephone survey in 2001 among African American women, 18 to 30 years of age, from five metropolitan St. Louis area zip codes. Of the 264 women initially contacted, 30 percent were unaware of SCD and were excluded from the remainder of the telephone interview.11 Women who were aware of SCD and completed the telephone survey had limited or incorrect knowledge of the disease, prevalence, and inheritance patterns. When asked what would be the best way to increase awareness about SCD in the African American community, respondents indicated mailing written information and distributing a video would be effective strategies.

Given the lack of awareness of SCD within the African American community, the clinical implications of having SCD, and the need for increased blood donation among African Americans, we hypothesized that distribution of a community-based education packet about SCD and the benefits of blood donation in a predominantly African American community would increase the number of blood donors over a consecutive 6-month interval when compared to the same intervals in the previous year.

MATERIALS AND METHODS
Community intervention, study design, and video content
The Institutional Review Board at Washington University School of Medicine approved this ecologic study in July 2002. The intervention began in October 2002. The intervention targeted 5000 of 9905 households (US Census 2000) in the 63115 zip code (one of the zip codes included in the 2001 telephone survey). Pfeiffer Plus, a communications company, in collaboration with team members from Washington University School of Medicine, produced an introductory postcard and an educational VHS video. The postcard included a picture of a local African American recording artist promoting the message of “Relying on You.” This message supported the idea that children with SCD at St. Louis Children’s Hospital were “relying on” the community to help by donating blood.12 The recording artist was featured in the video with the same title. The intervention’s educational packet included: the “Relying on You” video and three educational brochures about SCD and blood donation.

The video was created specifically to educate the African American community about the importance of blood donation. Barriers to blood donation among African American persons were identified in a previous project by our group.12 The educational packet was developed to address barriers to blood donation among African American persons. Women stated that barriers to blood donation included lack of education regarding the importance of blood donation, fear of needles, and fear of disease transmission or diagnosis of a disease. The video addressed these barriers by promoting positive messages of blood donation as safe, convenient, and life-saving. Studies performed by Boulware and associates13,14 have shown that sex and race influences willingness to donate blood. Data from one study strongly suggest that African American women were the least willing to donate blood compared with Caucasian women, African American men, and Caucasian men.14 African-American women were targeted in the current study because the survey asked questions regarding SCD as well as cord blood donation. We chose African American women because of the potential for increasing the blood donations within this population.

A random mailing list was obtained from St. Louis Pre-Sort, a mailing list management and distribution company. St. Louis Pre-Sort served as an independent subcontractor responsible for processing, packaging, and mailing the postcards and educational video packets. The postcard was sent on October 2, 2002. One week later, a packet containing the educational video with brochures about SCD was mailed. Three weeks later, a random-digit telephone survey was initiated with a national call list of telephone numbers from the 63115 zip code. The telephone survey began October 21, 2002, and continued until November 14, 2002. Eligibility for the study required participants to be self-identified as African American women 18 through 50 years of age who completed high school and were residents of the 63115 zip code. Interviewers conducted the survey and recorded responses to the 23 close-ended questions asked about the prevalence and inheritance of SCD and blood and cord blood donor activity.

The primary outcome measures were the percent increase in blood donors and the number of first time donors over two consecutive 6-month periods. We initially designed the study to assess the impact of the intervention over a course of 6 months. Subsequently, to determine the duration of the effect of the intervention, we added a second 6 months of evaluation.

Women were asked about their awareness of SCD, whether they had received educational materials in the mail (a postcard and/or video) about SCD, and whether
they had heard of anyone in the community receiving this type of mailing. Other questions asked to ascertain the interviewees’ opinions on blood donation included: 1) Have you ever donated blood? 2) How likely are you to donate blood sometime during the next 6 months? and 3) How likely would you be to donate blood if you knew your blood would go specifically to an African American child with SCD?

Statistical analysis

The random-digit dialing telephone survey was conducted by trained, marketing research personnel (Fleming Communications, St. Louis, MO). The telemarketing staff team contacted households approximately four to five nights per week. Interviews were executed with the Computer-Assisted Direct Interviewing software system. Upon completion of the telephone calls, the Computer-Assisted Direct Interviewing system was used to generate a call disposition report. Response data were imported into computer software (WinCross version 3.1, The Analytical Group Inc., Scottsdale, AZ) and summarized in cross-tabulated tables. Cross-tabulations were provided for each question among several categories: age, education level, whether respondents knew their sickle cell trait status, whether or not they had ever donated blood, their perceived likelihood that they would donate blood within the next 6 months, whether or not they received the educational video in the mail, and whether or not they had heard of others receiving educational videos in the mail. Computer software (Statistical Package for the Social Sciences [SPSS], Version 10.0, SPSS Inc., Chicago, IL) was used to perform paired t tests. One community received the intervention, the video, and mailing packet and was defined by a zip code. The comparison communities were also defined by zip codes and were neighboring communities. In the community that received the intervention, the paired t test was used to test the null hypothesis that the difference between the mean number of presenting donors at 24 weeks was 0 and the mean number of presenting donors at 52 weeks was 0. In the comparison communities, the paired t test was also used to determine if there was a difference between the mean number of presenting donors during the same periods as were assessed for the community that received the intervention. An identical paired t test analysis was used for first-time donors in the intervention and surrounding communities. Chi-squared analysis was performed with computer software (Computer Programs for Epidemiologic Analysis [PEPI], Version 4.0, Sagebrush Press, Salt Lake City, UT) to determine the difference in blood donor activity among those who received the video and those who did not.

RESULTS

Demographics and socioeconomic status of 63115 residents and surrounding zip codes

Residents of the 63115 zip code were primarily African American (98.2%; US 2000 Census). Approximately 45 percent of the population was composed of women between 18 and 54 years of age, with a median age of 39 years. Of the 9905 households, 37.6 percent had a woman as the head of the household. The median annual family income for this neighborhood was $24,587, 55.1 percent dwelled in owner-occupied housing, 29.7 percent of residents had received a high school diploma, 29.1 percent had attended some college, and 9.8 percent had a bachelor’s or higher degree. The demographic characteristics for the surrounding zip codes are displayed in Table 1. Individual demographic characteristics of respondents were not pursued because the focus was on the community that was defined by 63115 zip code and not the individuals that responded.

Telephone survey interviewers contacted 6499 households of which 1221 individuals were able to be reached (18.8%). The remaining 5278 households were unable to be reached for the following reasons: no answers, answering and fax machines, busy signals, privacy manager, and disconnected numbers. Of the 1221 individuals able to be reached by phone, a total of 675 persons started the survey but were later terminated because they did not meet the eligibility requirements. Of the 576 eligible women, 370 refused to participate and 176 completed the interview. To

<table>
<thead>
<tr>
<th>Zip code</th>
<th>African American (%)</th>
<th>Women age 18-54 (%)</th>
<th>Women median age (%)</th>
<th>Owner-occupied housing (%)</th>
<th>Renter-occupied housing (%)</th>
<th>Median family income</th>
<th>High school (%)</th>
<th>Some college (%)</th>
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<td>$23 330</td>
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* Zip code that received the SCD educational packet.
assess the impact of this intervention, the telephone survey was conducted with high school educated, African American women 18 to 50 years of age, residing in the 63115 zip code. Of the women who completed the survey, 65 percent (114/176) were between 18 and 30 years of age, 33 percent (58/176) were between 31 and 40 years of age, and 2 percent (4/176) were between 41 and 50 years of age. All of the women were high school graduates, and 27 percent (48) had some college education.

**Blood donor activity increased after mailing the video packet**

Six months after mailing the video packet, there was an increase in the blood donor activity in the intervention zip code 63115 (Fig. 1). When compared to blood donor activity from the first 6-month interval from the previous year, there was a 75 percent (217 vs. 124) increase in the total number of presenting donors (p = 0.05) and a 64 percent (126 vs. 77) increase in the total number of first-time donors (p = 0.02). When compared to the baseline interval of 6 months, no significant increases in the percent of blood donor activity were noted in the geographically adjoining zip codes during the first 6-month intervals before (see Fig. 2) and after the video intervention. No significant increases in presenting donors (p = 0.34; 95% confidence interval [CI], −12.6% to 5.3%) or first-time donors (p = −0.15; 95% CI, −13.3% to 2.6%) were noted in the second consecutive 6-month interval after the intervention for the 63115 zip code or in the geographically surrounding zip codes (see Table 2 and Fig. 3).

**Video packet influences willingness to donate blood**

Receipt of the video among these women influenced the magnitude of their response to this question. Women who were self-identified as able to donate blood and received the video (n = 27) were more likely to say they would donate blood in the next 6 months than women who could donate blood and did not receive the video (n = 132), 44 percent versus 23 percent, respectively.

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**Fig. 1.** Comparison of first-time blood donor activity in the 63115 zip code of St. Louis, Missouri, before and after the educational packet intervention. Six-month interval 1 (□) represents October 2001 through March 2002, the interval before the intervention. Six-month interval 2 (■) represents October 2002 through March 2003, the same interval after the intervention.

**Fig. 2.** Comparison of first time blood donors in the 63115 (□) video intervention zip code with the first-time donors in 63107 (●), 63112 (▲), 63113 (▲), and 63120 (○) surrounding zip codes in St. Louis, Missouri, 1 year before the video intervention.

<table>
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<th>TABLE 2. Before and after video intervention first 6-month blood donor activity in 63115, * 63107, 63112, 63113, and 63120 zip codes of St. Louis, Missouri</th>
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<td><strong>Zip codes</strong></td>
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* Zip code of SCD educational packet intervention.
DISCUSSION

Minimal information is available describing successful methods to improve blood donation among specific ethnic groups. This study addresses whether an educational video packet about SCD and blood donation mailed to an African American community would motivate residents to donate blood and improve baseline knowledge about SCD in the African American community. We have provided preliminary evidence indicating that when educated about the importance, convenience, safety, and life-saving elements of donating blood, African American persons will donate blood. The most significant finding of this work is the observation that a brief video tape explaining why blood donation is important, particularly for children with SCD, may be sufficient to motivate previous and first-time African American donors. The intervention used in this study maybe used in recruiting potential African American blood donors. Although mass mailings of a video with brochures to other African American communities may not be feasible because of cost, other locations, such as barbershops and hair salons, have been used to educate the public about important public health issues and may be reasonable alternatives.16-18 Further research is needed to verify that a short educational video can sufficiently motivate African Americans to donate blood. Our decision to couple the message about the importance of blood donation with a specific reference to the requirement of blood for children with SCD was based on a survey among African American women. When asked what would be the best way to increase awareness about SCD in the African American community, respondents believed providing information through various media such as pamphlets, educational meetings, television, and radio would be most helpful. When these women were asked, “What do you think are the most important things that could be done to significantly increase blood donations in the Black community?” The most common response was to increase the awareness of the need to donate blood. The results of the present survey substantiate our previous findings, namely that increasing awareness will increase the number of blood donors. As with any ecologic community-based study, this study had inherent limitations. Causality cannot be established in this study. An increase in the blood donor rates was not sustained in the area that received the intervention, and we lack a concrete explanation. There was an increase in first-time blood donors as well as presenting donors within the first 6 months after the intervention in the 63115 zip code. Blood donor rates, however, were not significantly sustained in the intervention zip code for presenting donors (p = 0.34) and first-time donors (p = 0.15) after the second 6-month interval. An additional limitation was that we could not document the viewing of the video tape. The women were only asked if they had received the video tape. The study could not document viewing of the tape; thus we focused on whether the tape was received.

The small sample size of the telephone survey, the low donor numbers, and potential sampling bias of having surveyed only high school–educated women affects the generalizability of this study. Different results may be obtained in a larger study or in another community with less educated women. Despite these limitations, we have demonstrated a proof of principle, namely a community education intervention program that is culturally sensitive to African American persons and may increase the number of total and first-time blood donors.

In summary, mass mailing of an educational packet with a video may increase the number of presenting and first-time African American blood donors. The results of the study indicate that the educational content describing the importance of blood donation for children with SCD is feasible and may be a motivator for donation within the African American community. Similar research is needed to test hypotheses concerning blood donor education and increasing blood donation in the African American population. Future work is required to determine more effective strategies to improve and sustain a high level of blood donor participation.
REFERENCES


