

Perceived changes in behavior and values after a red blood cell transfusion

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Background: Several studies have evaluated perceived changes in patients' behavior after an organ transplant, especially a heart transplant. Although blood transfusions are much more frequent and have many connotations, derived from religious values, mass culture, or personal ideas, there is no study of the perception the patients have of changes in their behavior and values after a transfusion. This study's objective was to assess perceived changes in behavior and values after a red blood cell transfusion.

Materials and methods: Exploratory study through semistructured interviews with seven adults transfused after orthopedic surgery.

Results: Blood had strong symbolic values for all subjects. Each of the seven participants mentioned positive characteristics that they would like to receive from the donor. Six subjects out of the seven acknowledged the possibility that transfusions might induce changes in behavior or values. Three subjects clearly stated that they would refuse to receive blood from a criminal for fear that some negative characteristic may be transmitted to them. Furthermore, three subjects acknowledged that their transfusion might have changed their own behavior or values.

Discussion: This study shows that patients might feel that transfusions could modify their behavior or values and that certain personality traits of the donor could be transmitted. Further research in a larger population is warranted to evaluate the incidence of a perceived change in behavior or values after a blood transfusion, which would then lead to changes in the way information is provided to future patients requiring transfusions.

Keywords: blood transfusion, psychological adjustment, personality

Plain language summary

Blood transfusions are a common treatment, but they are special in the way that it is an anonymous donor that gives his or her blood to the patient. As blood has connotations derived from religious values, mass culture, or personal ideas, we wanted to evaluate the effect of transfusions on patients' personality, specifically looking at perception of changes in their behavior or values. Through interviews with seven patients who were recently transfused, we showed that blood had strong symbolic values for all patients. Six out of the seven patients acknowledged the possibility that transfusions might induce changes in behavior or values, and three patients acknowledged that their transfusion might have changed their own behavior or values. This study shows that patients might feel that transfusions could modify their behavior or values and that certain personality traits of the donor could be transmitted. Further research in a larger population is warranted to evaluate the incidence of a perceived change in behavior or values after a blood transfusion.

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Introduction

In 2013, there were more than 6.1 million red blood cell (RBC) transfusions in the United States.¹ Each year, one person out of 25 receives a transfusion, making it one of the most used medical treatments.

Blood has many connotations derived from religious values, mass culture, or personal ideas. One of the first known transfusions, performed in 1667 by Jean Baptiste Denis, was the administration of blood from a lamb to treat a patient with chronic fever.² Denis used animal blood for transfusion because he believed it less likely “to be rendered impure by passion or vice.” Nowadays, there still are some cultural beliefs that blood transfusions can convey the donor’s characteristics to the recipient.³ However, there is little scientific evaluation of possible changes in behavior after a transfusion. Waldby et al⁴ showed that some donors considered blood to be a “bearer of personality or moral disposition,” and the transfusion could transmit these traits. Mahon-Daly⁵ also described that some blood donors believed that there might be some link between themselves and their donated blood. However, these studies evaluate the perceptions of the donors, not of the recipients.

On a related note, the recipient’s perspective on perceptions of changes in behavior or values has been evaluated in patients who benefited from an organ transplant.^{6,7} Some reports show direct links between the receiver’s personality change and the donor’s personality, such as changes in eating habits and choices, music, sexual orientation, etc.^{8,9}

As transfusions of blood products are much more frequent than organ transplants, it seems appropriate to evaluate whether patients perceive a change in their behavior or values after a transfusion. Understanding and acknowledging such perception of changes would help improve the information provided to patients prior to the transfusion.

The objective of this study is to explore the perception of behavioral changes after a RBC transfusion.

Materials and methods

The exploratory study was based on personal interviews with seven adults who had been recently transfused. A semistructured questionnaire evaluated various aspects of possible behavioral changes (Box 1).

Eligibility criteria were as follows: 1) to have had at least one RBC transfusion; 2) to have been admitted in the orthopedic unit of the Geneva University Hospital; 3) to speak French; and 4) to have normal cognitive functions.

We did not predetermine the sample size, since it was a qualitative exploratory study.

Our project was approved by the Geneva Ethics Committee (CCER 2016-00582). All participants gave their written, informed consent. Participants were not remunerated.

The interviews took place in the patient’s room or in a meeting room of the orthopedic unit. We started with a digital recording. We then did a verbatim transcription of the answers and coded them according to a semantic analysis to extract the main themes that were identified by two authors.

Box 1 Semistructured interview

1. What do you know about transfusion?
 - What is transfused?
 - Do you know how long the donor’s blood remains in your body?
2. Do you know who can be a donor and how the donation is carried out?
3. What do you feel toward the donor?
4. If you could have chosen, what characteristics would you have liked your donor to have?
5. If it were a matter of life and death, would you have accepted a criminal’s blood?
6. In the same life and death situation, would you have accepted an animal’s blood?
7. Some people think that transfusions may have beneficial effects, whereas others think that they may have harmful effects. What do you think?
 - Do you think that transfusions may affect you physically?
 - Do you think that transfusions may affect you psychologically? Or that they may have religious consequences?
 - Could transfusions have any other consequences?
8. Some persons think that changes in behavior can happen in the transfused patient, whereas others think it impossible. What is your opinion?
9. What could those changes be?
10. There are several theories explaining behavioral changes. What would your own assumptions be?
11. What does blood mean to you, according to your beliefs?
12. If you had had a choice, would you have preferred to be transfused or not?
13. Did you understand the questions?
14. Did the questions disturb or stress you?
15. Demographic data.

Results

We enrolled seven subjects from September 2016 to February 2017. Their median age was 74 years (range 61–87). Five of them (71%) had a hip replacement, and the other two had a knee joint replacement. Four participants (57%) indicated that they had religious beliefs, one said he was a “free thinker” and the other two called themselves “nonbelievers” (Table 1). The median duration of the interview was 30 minutes (range 25–40).

Values attributed to blood

All seven subjects defined blood as “life”: “Blood has color, it gives life,” “It is something that allows me to live,” and “If they give me blood, they rescue me; therefore, it is rather a vital energy.” One of the patients expressed the same idea differently: “It is like an engine in a car, without it, it does not work.” Two of the subjects compared blood to “water”: “It is life’s water”; “It is something essential to the human body, like water.” One of the participants saw blood as the “bank” of the human body, whereas another considered it more like “power.”

Feelings toward the donors

The most commonly expressed feeling toward donors was “thankfulness”: “It’s a great act of faith on their part. I am grateful.” The five subjects who were grateful toward donors added that they did not wonder about donors’ identity: “I am grateful, I thank them a lot. Beside that I don’t ask myself too many questions.” One subject spoke of “human solidarity”: “If someone can do it, it must be done on the basis of human solidarity,” whereas another subject said that he did not feel any emotion toward the donor. “I see him as someone turning his back on me, someone who doesn’t care, even though we are intimately linked now... I have not felt anything yet.”

Asked whether they would accept receiving a criminal’s blood, one of the subjects mentioned “forgiveness”: “If it is a matter of life and death, we must forgive. It is a kind of penitence,” whereas another thought it was a way of turning

the page: “A criminal is a human being; he’s done something stupid in his life, yet, on the other hand, life goes on.”

Transmission of the donor’s characteristics

Most subjects wished that the transfused blood came from a donor who is like them, physically as well as mentally: “I would like the donor to be a bit like me.” But one of them said the contrary: “My first idea when you asked the question was: ‘I would like someone rather like me,’ then I immediately thought: ‘No, rather not!’ It would be interesting if it were someone completely different who could transmit me something new.” Characteristics most commonly mentioned were positive and concerned usually personality traits rather than physical appearance: “A bon vivant who does not go too far in all areas”; “somebody who respects his wife and children”; “somebody full of energy and of the joy of living, who is honest”; and “a person who is calm, not nervous.”

Five of the seven subjects would absolutely refuse a criminal’s blood, two because they feared the transmission of diseases “it is often a drug addict or somebody with AIDS,” and three because they feared the transmission of a “bad characteristic”: “No, because I fear that something will be transmitted”; “No! I must receive an honest person’s blood, because I fear that the blood could contain a negative gene and that it might turn me into a criminal. I refuse, even if I am on the verge of death.” On the other hand, the idea of receiving animal blood was better accepted, as only one would refuse. Most interviewees thought that, unlike men, animals were good: “I would rather accept animal blood because I know that animals are fundamentally less flawed than human beings” and “I would accept, depending on the animal. I think that animals have a much sounder mind.”

Changes induced by the transfusions

Six subjects mentioned that physical or psychological changes could be induced by transfusions. Five of them thought character changes could be the result of receiving a transfusion: “Maybe I would become harsher or softer”; “Some traits could

Table 1 Demographic characteristics of the subjects

Characteristics	Age in years	Medical condition	Occupation	Highest schooling	Religion
Subject 1	74	Hip replacement	Postman	Elementary school	Nonbeliever
Subject 2	75	Hip replacement	Bank clerk	Middle school	Nonbeliever
Subject 3	61	Hip replacement	Construction worker	Elementary school	Catholic
Subject 4	68	Hip replacement	Civil engineer	University	Catholic
Subject 5	81	Knee joint replacement	Postman	Elementary school	Protestant
Subject 6	74	Knee joint replacement	Psychosocial therapist	University	Free thinker
Subject 7	87	Hip replacement	General practitioner and rheumatologist	University	Protestant

change, one could become aggressive or touchy or impatient.” One participant contemplated potential physical changes: “I see mainly physical effects; as for psychological effects, it is only because you raised the question that it comes to my mind.”

Four subjects believed their own transfusions had no physical or psychological effect on themselves. However, one subject believed that the transfusions had changed his sleep: “Nowadays I dream a lot.” Another subject indicated that the transfusion had changed his mood: “It put me in a good mood [...] before that, I felt weak, it has made me more energetic.” And a third subject reflected that his tastes might have changed: “Maybe it is possible that there may be changes in tastes. Unfortunately, I received blood from two donors, which makes it more complex.” The subject ended the interview by saying “[The donor’s blood] cannot take over. At least I hope so.”

Discussion

Our exploratory study showed that the majority of the subjects could conceive that RBC transfusion might transmit some of the donor’s traits. Furthermore, three subjects out of seven indicated that they had perceived changes in behavior or values after their own RBC transfusion.

Blood is very strongly associated with values coming from religious texts and cultural connotations. The Bible has numerous references to blood, implying that the soul lies in the blood: “For the life of the flesh is in the blood” (Leviticus 17:11), and referring to the redemption value of sacrificed blood: “Almost everything is purified with blood” (Hebrews 9:22). Some biblical references, such as “But be sure you do not eat the blood, because the blood is the life, and you must not eat the life with the meat” (Deuteronomy 12:23), have led Jehovah’s Witnesses to refuse blood transfusions. Ethnological studies have reported that different cultures believe that drinking blood can convey some traits.¹⁰ Our results indicate that these beliefs are still present in patients. Six of the seven subjects consider “blood is life” to be true and most of them would like the transfusion donor to have positive traits, such as “full of energy,” “respectful,” “honest,” or “calm.” Five subjects would refuse blood from a criminal, arguing that something might be transmitted. Six subjects also acknowledged the possibility that transfusions might induce changes in behavior or values and three believe that the transfusion might have changed their own behavior. Therefore, these results indicate that the very strong religious and cultural beliefs about the values attributed to blood and their potential transmission are deeply embedded in patients who were transfused.

These findings are similar to those reported after solid organ transplantations. A few authors have reported perceived behavioral changes, mostly after heart transplantation. Pears-

all et al⁶ report heart transplant recipients who have experienced changes in their music tastes to match the donor’s tastes or who have developed aquaphobia after having received the heart of a patient who drowned, without any knowledge of the donors’ tastes or death circumstances.⁶ Joshi⁷ reports the case of an 8-year-old child who received the heart of a murdered 10-year-old girl. The recipient began having recurring vivid nightmares about the murder, and later described the crime scene to the police with sufficient details to allow them to find and convict the suspect.⁷ However, to our knowledge, there has been no systematic research on this population.

It seems important to recognize that patients might perceive changes in behavior or values after RBC transfusions. Until now, patients who experience these changes might feel isolated and misunderstood. Therefore, future research done on a larger scale should focus on this issue to determine the prevalence of the perceived changes and potential risk factors. This knowledge should then be translated into the informed consent process prior to RBC transfusions.

Some limitations must be recognized. First, the sample size is too small and the subjects were too homogeneous in terms of age and recent surgical experience to generalize these results to other populations. Furthermore, as this was a first exploratory study, we did not pursue additional participants until saturation of themes had been obtained. Further studies must evaluate the perceptions of changes in behavior or values after RBC transfusions in larger populations and in different cultural settings. Second, the interviews were conducted shortly after the RBC transfusions, during the hospital stay. The patients might be confusing the perceived changes with other psychological adaptations to the situation or physical effects of their surgery. Third, our semistructured interview might have induced some of the answers, although we have tried to avoid this in our worded script. Therefore, it is not known how often patients spontaneously think of inheriting characteristics of their donor. Finally, the study design might have induced a desire-to-please bias, as the respondents could have answered according to what they expected us to want.¹¹

Conclusion

In conclusion, our results showed that the majority of the subjects could conceive that RBC transfusion might transmit some of the donor’s traits. Furthermore, three subjects out of seven indicated that they had perceived changes in behaviors or values after their own RBC transfusion. Better understanding the frequency and importance of these perceived changes is important as physicians might have to include such information while getting informed consent for transfusion.

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Author contributions

Marianna Broccolo and Oliver Karam initiated the project. Marianna Broccolo, Nicolas Favez, and Oliver Karam wrote the protocol. Marianna Broccolo interviewed the subjects. All authors contributed toward data analysis, drafting and critically revising the paper and agree to be accountable for all aspects of the work.

Disclosure

The authors report no conflicts of interest in this work.

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