Blood Transfusion Safety: The Potential Role of the Patient

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There are many initiatives to reduce transfusion-related errors. However, one important intervention that remains largely unexplored is that of patient involvement. This article considers the patients' role in ensuring safe care along the transfusion trajectory. Study Design and Methods: Empirical data on patients' attitudes to, and involvement in, transfusion-related behaviors were systematically reviewed. Opportunities for patient involvement in transfusion processes were identified by extant national guidelines and expert consultation. Results: A number of transfusion-related behaviors in which patients can participate were highlighted, but to date, little is known about patients' preferences for taking on an active role. Many patients have no recollection of consenting to a blood transfusion, and some are not even aware they have been transfused. Information provided to patients about transfusion is often poorly understood. Patients have a number of misconceptions about the safety of blood transfusion, and the way in which information is presented to patients can significantly affect their level of confidence and subsequent acceptance in receiving a blood transfusion. Summary: One important intervention that could help to improve the quality and safety of the blood transfusion process is involvement of the patient themselves. This article considers the patients' role in ensuring safe care at different stages of the transfusion trajectory. The literature on patients' attitudes to, and involvement in, transfusion-related behaviors was systematically reviewed and opportunities for patient involvement were identified. The evidence suggests that although there is considerable potential for patients to be involved in different blood transfusion processes, it is very unclear at present how able and willing patients would be to take on an active role in this aspect of their health care management. Research in this area is paramount in helping to inform the design and implementation of interventions aimed at encouraging patient involvement in this very important but largely under-researched area.

BLOOD TRANSFUSION IS a remarkably safe procedure, but like many other clinical procedures, it is associated with clinical risks. These include transfusion-transmitted infection and unexpected clinical complications such as transfusion-related acute lung injury. In addition, adverse effects occur due to error and suboptimal care during the transfusion process. In the last 20 years, many studies have documented errors at all stages in the transfusion process,[1-6] and there have been many initiatives to minimize the occurrence of errors. These initiatives have primarily focussed on education and training, but a variety of technological innovations including bar coding and the use of hand held computers have reported promising results.[7] Technological solutions may facilitate good transfusion practice, but the expertise, rigor, and monitoring of the process by experienced staff provide the final protection for the patient. Finding better ways to train and support the staff directly involved in the many steps of the transfusion process remains essential.

In this article, we suggest that, in addition to training staff in transfusion safety, there is considerable potential for a role for patients in ensuring safe practice. Within the wider arena of patient involvement, many opportunities for patients to participate in safety-related aspects of their health care have been identified,[8-11] but the specific context of transfusion safety remains unexplored. This is a complex issue, and the whole question of patient involvement in transfusion requires detailed consideration. We do not know, for instance, how willing patients are to be involved, what they could reasonably be expected to do, or how much their involvement might be affected or

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curtailed by age, illness, culture, and familiarity with the transfusion process. In this review, we present an overview of the sparse existing literature on patient experience and involvement in transfusion, and then systematically consider the ways in which patients might be more involved. Finally, we propose a research agenda for patient involvement in blood transfusion.

PATIENT EXPERIENCE AND ATTITUDES TOWARD TRANSFUSION

To provide a foundation for this assessment of the potential for patient involvement in improving transfusion practice, we carried out a systematic search of the medical literature. We searched for articles that contained empirical data related to patients' attitudes and/or experiences of allogeneic blood transfusions and/or attitudes toward participating in transfusion-related behaviors (the specific search strategy is available from the authors). Empirical articles on patients' attitudes toward autologous blood donation or domiciliary transfusion services were not considered. Fifteen articles were of relevance (from 2018 retrieved). On closer inspection of the findings, data could be categorized into 6 main areas of interest. Here we synthesize the key findings for these studies in relation to these different areas. For a more detailed account of the findings and information on the design and methodologies of the studies, please refer to Table 1.

Given that patient involvement in health care is a fairly recent phenomenon, particularly in some (less developed) communities, we considered it important to provide the time and place where the study occurred, as these could affect patients' attitudes and/or participation in the transfusion process. The attitudes, expectations, and involvement of patients in Pakistan, for example, are likely to be culturally different to those patients in, for example, Canada. For these reasons, when referring to the different studies in our discussion, we highlight the time (ie, the year) the work was published in parentheses and the place (ie, country) the study took place.

ISSUES RELATED TO CONSENT AND COMMUNICATION OF RISKS AND BENEFITS OF TRANSFUSION

Studies from a number of countries suggest that the process of consent (including the discussion of risks and benefits) is often poorly recalled, though whether this is because the consent was not properly given or simply not remembered is not clear. Data derived from adult patients at a tertiary care centre in Canada (published in 2005) showed that while 80% of patients recalled talking with health care professionals about blood transfusion and signing a separate consent form for transfusion, 44% had no recollection of the discussion of transfusion risks (such as the risk of viral infections or bacterial contamination). In addition, 75% reported not being given information on the risks of being given the wrong blood, and 88% stated that alternatives to a transfusion had not been discussed. As could be expected, patients who were given a pamphlet on blood transfusions felt well informed and comfortable with the decision to accept blood, although only 19% recalled receiving such information.[12] A study (in 1997) of postoperative cardiac surgery patients in England reported that 71.5% said that they received no or little information before the operation on risks related with transfusion.[13] In parallel studies from Scotland and England (published in 1993 and 1997, respectively), 47% of transfusion patients from 3 different specialities (orthopedics, pediatric cardiac surgery, and obstetrics) did not recall being told that they might require a transfusion[14], and only 27% of a group of medical and surgical patients recalled that their verbal consent to transfusion had been obtained.[15] Many of these patients would have liked to receive more information, specifically in the area of complications, so they could have a better understanding of the risks associated with the transfusion itself. However, despite these findings, the majority felt they had received enough information and understood why the transfusion was necessary (82% and 92%, respectively).[15] Other favorable findings from members of the Swedish public (published in 1998) reported that 95% were positive toward consenting to a transfusion.[16]

Transfusion Risk-Related Attitudes

It is likely that patients' transfusion-related risk perceptions will affect the extent to which they will consent to a blood transfusion. Four studies have shown that many patients are worried about the safety of transfusions.[17-20] One study (published in 2001) on orthopedic patients in Ireland showed that only 11% had no concerns about the safety of blood

Table 1. Key Findings of Papers in the Review

First author, date	Aims	Methods	Subjects	Key findings of relevance to review
Al-Drees, 2008[18]	To determine the attitude, belief, and knowledge about blood donation and transfusion	Quantitative questionnaire	609 patients and members of the public in Saudi Arabia	• 55.1% (n = 336) thought blood in blood banks was safe. • 17.4% (n = 106) believed all surgical procedures require transfusion. • 20% (n = 122) of patients would refuse a transfusion even if they were in need of one because of the risk of acquiring an infectious disease. • 49 % (n = 298) stated they would only accept a blood transfusion from a relative, the belief being that this would reduce the likelihood of acquiring an infection. • 58% of women (n = 159) and 65% of men (n = 217) preferred to receive a blood transfusion from the same sex, as they believed this would reduce the likelihood of infection.
Chan, 2005[12]	To characterize patients' recall and knowledge of the consent process for a blood transfusion	Quantitative questionnaire	344 patients at London Heath Sciences Centre in Canada	• 80% (n = 275) of patients recalled discussing blood transfusion with a health care professional and signing a consent form. • 44% (n = 151) did not recall the discussion of specific transfusion risks (of these, 61% reported no information on the risks of being given the wrong blood and 88% stated that alternatives to a transfusion had not been discussed). • 19% (n = 65) recalled receiving a pamphlet; these patients felt better informed and more comfortable with the decision to accept blood ($P < .05$). • 35% (n = 119) felt better informed and happier with the decision to accept blood after the written consent process.
Farrell, 2002[24]	To investigate public perception of risk of HIV infection associated with blood donation	Quantitative questionnaire	168 undergraduate students in England	• All students were given information on the transfusion process as being safe, but those patients that were also given information on the small risk of HIV were 11 times more likely to think they could catch HIV than those that were not given this information.
Farrell, 2001[21]	The effects of message framing on patients' confidence in safety of transfusion	Quantitative survey	254 undergraduate students in England	• Patients who are given information in a gain frame format (n = 85) were significantly more likely to have confidence in blood safety than those given information in a loss frame format (n = 86). • There were no differences between levels of confidence for those patients that were given information in a loss frame format or combined frame format (n = 83). • As perceptions of the risks of transfusion increased, the willingness to accept blood was reduced.

Finucane, 2000[20]	To investigate perception of risks related to transfusion	Quantitative telephone survey	1204 members of the public in the United States	• 46.6% (n = 401) gave a moderate or high rating for the perceived risk of blood transfusions • 60.9% (n = 260) agreed or strongly agreed that blood supply in the United States is safe and 36.2% (n = 154) disagreed or strongly disagreed. • Patients who felt they had little control over their health (n = 428) were more likely to perceive transfusion as risky than those that felt they had a lot of control (n = 417). • Patients that were female or educated to less than degree level were more likely to perceive blood transfusion as risky.
Fitzgerald, 1999[25]	To investigate patients' perspectives of blood transfusions	Qualitative interview study	19 hospital patients in Australia	• Some emergency patients could not remember being told they were to have a transfusion. • Health care professionals talked about transfusion and the safety of transfusions but did not really give patients a chance to voice any concerns—patients were given factual information before they consented but they were given little opportunity to discuss it. • There were numerous incidences of patients saying they had been told something they did not understand—those who had best understood were those with prior experience of transfusion. • Patients were dissatisfied when they were not given enough information • One patient actually said they sneaked a look at the blood to make sure it was the right one. • In terms of self-care, 2 patients took an interest in the timing of the blood to ensure they received it at the correct time and one patient monitored the transfusion kept dripping,
Gerbert, 1991[22]	Patients' perceptions of risk of AIDs in health care settings	Quantitative telephone interviews	2000 members of the public in the United States	• 72% (n = 1440) of patients thought you could get AIDs from a blood transfusion.
Gray, 1993[14]	Patients' experiences of blood transfusion	Quantitative interview	350 patients (or parents in the case of pediatrics) who underwent surgery in Scotland	• 12% (n = 42) of patients did not know a transfusion had been given—20 of these patients thought they should have been informed. • 47% (n = 166) of patients could not recall being told they might receive a transfusion during their hospital stay. • 16% (n = 55) of patients were concerned at having a transfusion, 22 of these had discussed concerns with staff and 18 felt they received a satisfactory answer.

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Table 1. ***(continued)***

First author, date	Aims	Methods	Subjects	Key findings of relevance to review
LeMay, 2001[13]	Patients' perceptions of cardiac anaesthesia services	Quantitative questionnaire	170 hospital patients in Canada	• Before the operation, 71.5% (n = 122) of patients said that they received information regarding the risks related to transfusion.
Luby, 2001[19]	Patients' perceptions of blood transfusion	Quantitative interview	141 patients from 13 hospitals in Pakistan	• 38% (n = 54) were apprehensive about receiving a transfusion. • 83% (n = 117) of patients were unaware of any screening procedures for blood transfusions. • 30% (n = 42) believed blood transfusion should be available with prescription. • 4% (n = 6) were concerned about the risk of disease transmission.
McCarthy, 2001[17]	Patients' perceptions of blood transfusion	Quantitative questionnaire	203 hospital outpatients in Ireland	• Only 40% (n = 82) said they would be happy to consent to a transfusion. A further 45% (n = 90) would reluctantly consent if deemed essential. • Only 11% (n = 22) had no concerns about the safety of transfusions.
Moatti, 1994[23]	To investigate public perception of AIDS	Quantitative questionnaire	900 members of the public in France	• 91% (n = 819) of patients thought you could catch HIV through blood transfusions.
Murphy, 1997[15]	Patients' attitudes to information given about transfusions	Quantitative questionnaire	51 hospital patients in England	• 82% (n = 42) of patients said they received enough information. • 93% (n = 47) understood why the transfusion was necessary. • 20% (n = 10) would have found additional information helpful and 53% (n = 27) felt it would have been helpful to have written information.
Regan, 1999[26]	To investigate whether patients know they have been transfused	Quantitative questionnaire	3239 surgical patients from 22 hospitals in England	• 17% (n = 537) of patients were not aware they had been transfused. • The level of awareness of transfusion among surgical patients varied from 2% to 40% at each hospital.
Sanner, 1998[16]	Patients' attitudes toward transplantation	Quantitative questionnaire	1500 members of the public in Sweden	• 95% (n = 1425) of patients had positive acceptance about receiving blood and would consent to a transfusion.

transfusion.[17] Three other studies from Saudi Arabia (published in 2008), Pakistan (published in 2001), and the United States (published in 2000), respectively, have reported that only 55.1% of hospital patients believed that blood in blood banks was safe,[18] 38% of hospital patients were apprehensive about receiving a transfusion,[19] and 45% of the general public provided a moderate or high rating for perceived risks associated with transfusion for self and family.[20] In this latter study, more than 36% of respondents also "disagreed" or "strongly disagreed" with the statement that "the blood supply in the United States is safe," and a third of respondents would not accept blood because they viewed this blood as potentially "unsafe." This finding was particularly evident in women and those educated to less than degree level. As might be expected, people who perceived transfusion as risky were less likely to accept transfusion as an intervention.[20] This finding was also reflected in another study in England (published in 2001) on students' risk perceptions toward blood transfusions.[21] Further data obtained from orthopedic patients in Ireland (published in 2001) reported that only 40% of those questioned said they would be happy to have a transfusion; another 45% would agree to it reluctantly only if it was considered absolutely essential.[17]

Patients are of course correct that there are risks associated with transfusion, but these studies suggest that some patients perceive transfusion as frankly dangerous. The variation in the perception of risk associated with transfusion in these studies may be associated with a real variation in the actual risk in different countries or by media coverage of specific high-risk cases. The studies of transfusion risk in Ireland[17] and the United States[20] may have been stimulated by the publicity given to the high risks of hepatitis C virus (HCV) and human immunodeficiency virus (HIV) in the 1990s.

Why Patients May Refuse Transfusions

In some cases, the perceived risk of transfusion may be so high that patients might actually refuse a transfusion. Indeed, this was revealed in data collected from patients and members of the public in Saudi Arabia (published in 2008) in which 20% would refuse a transfusion even if they were in need of one because of the perception of risk of acquiring an infectious disease. In addition, 49% stated that they would only accept a blood transfusion from a relative, the belief being that this would reduce the likelihood of acquiring an infection.[18] Alternative data from the public (published in 1991) derived from the United States found that 72% of those questioned thought that it was "likely" that a patient could contract HIV infection from having a blood transfusion.[22] Analogous findings were yielded on 2 face-face surveys (also on members of the public in France (published in 1994); 91% of those interviewed thought patients were at risk of contracting HIV from a blood transfusion.[23] However, contrary to the above findings, data derived from hospital patients in Pakistan (published in 2001) reported that although 38% were apprehensive about receiving a transfusion, only 4% were concerned about the risk of disease transmission.[19] As in the previous section on patients' attitudes to transfusion, the likelihood of refusing a transfusion because of a perception of a high risk of infection associated with transfusion is almost certainly associated with the actual risk of infection, and this varied in the studies described in this section in different countries and at different times.

The Effect of Information Formatting/Structuring on Risk Perception

Research also suggests that the way in which risk-related information is conveyed to patients can affect their perceptions. This is reflected in 2 experimental studies both conducted in England on an undergraduate student population. The first study (published in 2001) provided participants with factual information about blood transfusion, but framed it in 3 different ways: (1) gain frame (ie, lives saved from transfusion), (2) loss frame (ie, lives lost from transfusion), or (3) a combined frame (ie, a loss expressed in a positive context). Participants that received the gain frame information were significantly more confident with the safety of blood transfusion than those in the other 2 conditions.[21] The second study (published in 2002) allocated participants into 1 of 3 conditions: (1) information about the transfusion process as being safe, (2) the same information as condition 1 but also with a small risk of contracting HCV, or (3) the same information as condition 1 but with the risk of contracting HIV. The results showed that although there were no differences in the HCV-cued condition, patients in the HIV cued were 11 times more likely to think that they could catch HIV through a transfusion when compared with the no-cue condition (condition 1).[24]

Willingness to Participate in Transfusion-Related Behaviors

There is almost no information on whether transfusion patients might be willing to engage in transfusion-related behaviors. However, one small study in Australia (published in 1999) revealed 4 examples of patients wanting to take an active role in checking processes.[25] One patient said that they sneaked a look at the unit of blood that the nurse was giving them to ensure they were being given blood with the correct blood group. Two patients said that they would like to have a role in the timing of the blood to ensure that it is administered when it should be, and one patient undergoing prolonged chemotherapy was worried about the state of his veins and so monitored the transfusion kept dripping and the cannula site was protected so the vein could be used again.

Patients' Awareness and Understanding of Being Transfused

Preliminary information derived from Australia (published in 1999) indicates that patients do not always comprehend what they have been told about blood transfusion, though, as would be expected, patients who had been transfused before had a better understanding.[25] In addition, a study on surgical patients in England (published in 1999) revealed that 17% were not even aware they had been transfused.[26]

SUMMARY OF KEY FINDINGS

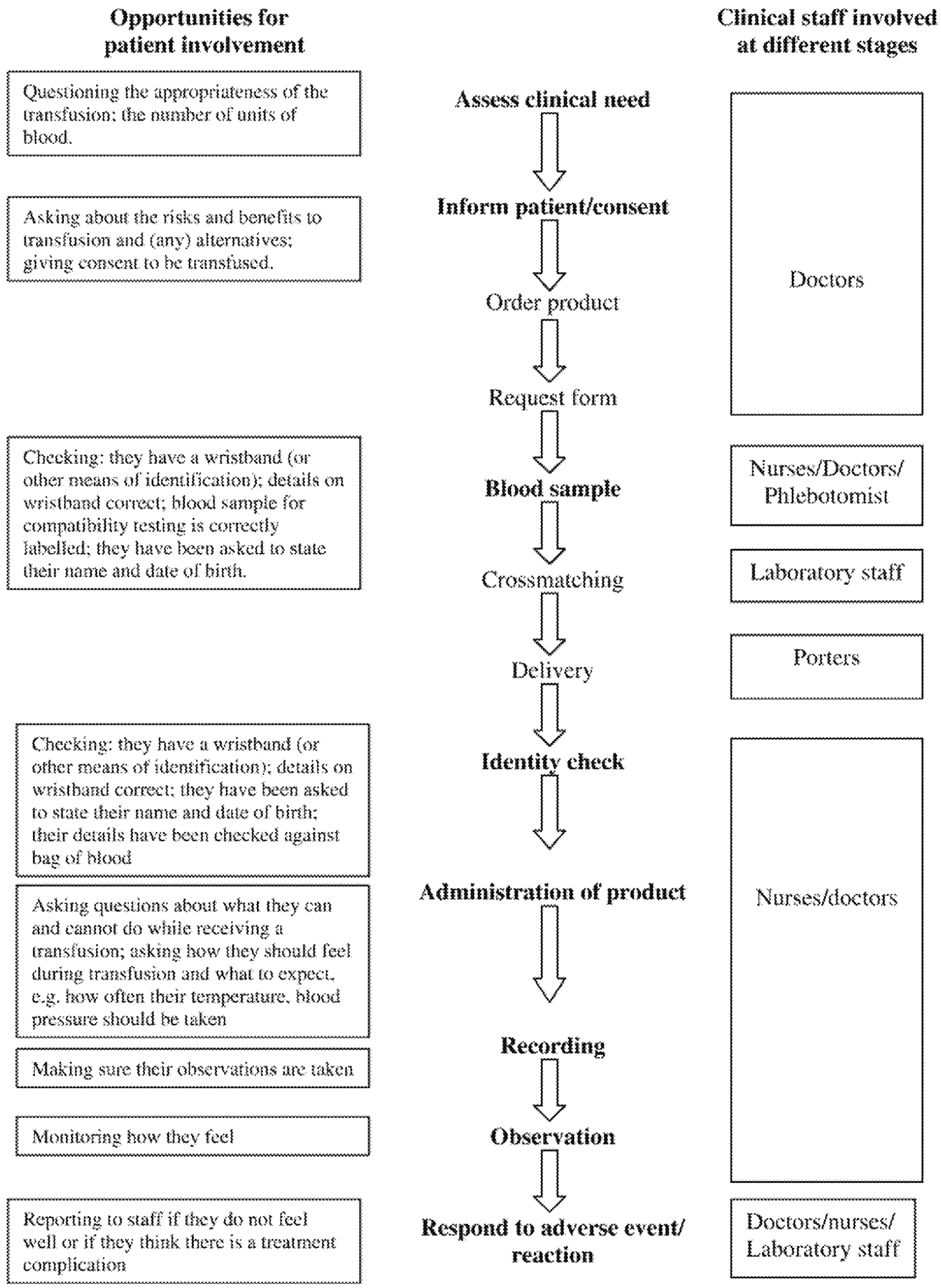
Research on patient experience and involvement in transfusion is sparse and scattered across different countries and clinical settings. However, this small group of studies suggests that many patients have a very limited understanding of the true benefits and risks of transfusion. It seems that many people, whether current transfusion patients or members of the public, have considerable anxieties about transfusion with patients in some settings regarding it as so unsafe that they might refuse a transfusion, even though it was considered clinically necessary. Patients who have received transfusion often do not recall the consent process, either because they were not given full information or because they rapidly forgot it. Overall, the findings suggest that communication with both transfusion patients and the general public needs to be improved. In addition, it is clear that patients are concerned about transfusion-related risks, which may mean that they would be willing to be more actively engaged in transfusion safety. The remainder of the article addresses these issues.

POTENTIAL FOR PATIENT INVOLVEMENT IN THE BLOOD TRANSFUSION PROCESS

Although there is little research on these topics, the degree to which patients might be actively engaged in the transfusion process can be assumed to depend on a number of factors. First, patients must have knowledge on how to be involved—we cannot expect patients to participate if they do not know how and when they can. Second, patients must be able to participate—this ability in part is derived from the patient's knowledge but is also largely dependent on their physical and cognitive capacity. Third, they have to be willing to participate—in other words, they have to want to take on an active role.

In recent years, a number of organizations in the UK have introduced initiatives (such as leaflets and posters) aimed at informing patients about blood transfusions, with the aim of improving their knowledge, ability, and willingness to participate.[27-30] However, although these initiatives are well intentioned, we have little information about whether they are read, how effective they are, or whether there are any adverse effects of providing safety-related information. More importantly, the provision of general information is only the first step in patient engagement. We consider that it would be useful to examine the transfusion process systematically to identify specific ways in which patients can be involved. In the following sections, we consider some of the key opportunities for patient participation in more detail before, during, and after transfusion.

Figure 1 depicts the main opportunities for patient involvement in the transfusion process. The ways in which patients could participate were identified by referring to existing national initiatives and recommendations and expert consultation with consultant hematologists and nurses. The pretransfusion and during transfusion checks would of course only be applicable to those patients that are conscious while being transfused, whereas the posttransfusion checks can be generalized to both those patients conscious and unconscious during the actual administration of the blood.



Questioning the appropriateness of the transfusion; the number of units of blood.

Asking about the risks and benefits to transfusion and (any) alternatives; giving consent to be transfused.

Checking: they have a wristband (or other means of identification); details on wristband correct; blood sample for compatibility testing is correctly labelled; they have been asked to state their name and date of birth.

Checking: they have a wristband (or other means of identification); details on wristband correct; they have been asked to state their name and date of birth; their details have been checked against bag of blood

Asking questions about what they can and cannot do while receiving a transfusion; asking how they should feel during transfusion and what to expect, e.g. how often their temperature, blood pressure should be taken

Making sure their observations are taken

Monitoring how they feel

Reporting to staff if they do not feel well or if they think there is a treatment complication

NB. Processes shown in bold letters indicate stages of the pathway where patient involvement is possible

Figure 1. Patient involvement in the transfusion process.

OPPORTUNITIES FOR PATIENT INVOLVEMENT BEFORE THE TRANSFUSION

Assessing Clinical Need

Before consenting to the transfusion, the patient could be involved more actively in the assessment of the clinical need for the transfusion (eg, whether the transfusion is appropriate or necessary). This is important because although there has been considerable progress in the avoidance of inappropriate transfusion, as evidenced by a near 20% decrease in the use of red cell units in England since 2002/2003, audits of transfusion practice consistently identify that 20% or more of transfusions of red cells, platelets, and fresh frozen plasma are used outside the recommendations in national guidelines.[31] An example of the involvement of patients in considering the need for transfusion is the self-assessment of bleeding by patients with severe thrombocytopenia undergoing intensive chemotherapy or hematopoietic stem cell transplantation for hematologic malignancies while participating in a trial of different strategies for platelet transfusion.[32]

New initiatives are needed to ensure that blood is only used when it is clinically indicated. There is a need for research to investigate the extent to which patients would be comfortable questioning health care professionals about the appropriateness of receiving blood, so that new initiatives for patient involvement in transfusion decision making can be designed and implemented.

Providing Informed Consent

The next step in the transfusion sequence at which patient engagement is critical (and is indeed required where possible) is by providing consent to receiving blood. It is standard policy in every hospital in the United Kingdom that patients, providing they are conscious, should provide their consent to being transfused if this is required during their care. For example, patients undergoing surgery are required to sign a surgical consent form to indicate that they are willing to be transfused if it becomes necessary. However, for patients to provide their informed consent, they need to be given information on the risks, benefits, and alternatives (if any) to the transfusion. Research we have reviewed indicates, however, that patients' often do not recall such discussions taking place.[12,14,15]

Identity Check, Checking, and Administration of Product

Perhaps the most important way that patients could contribute to transfusion safety is by helping to reduce misidentification errors. Blood transfusion is one of the major areas where serious clinical consequences, even death, related to patient misidentification can occur.[33] The annual Serious Hazards of Transfusion report for 2008 revealed that 262 blood transfusion incidents (of a total of 1040) were related to incorrect blood component transfusion, 47 of these were specifically administration of the wrong blood.[34] Involving patients at a number of stages in the transfusion sequence could help to prevent the occurrence of these incidents. For example, before the ordering of the blood patients could participate in ensuring that the blood sample for compatibility testing is correctly labelled. Before transfusion, patients could participate in the identity check and in the administration of the product. At present, we do not know how willing patients would be to engage in these checking behaviors. In addition, many patients may not have the ability to participate. Often patients that are transfused receive blood in the operating room or intensive care unit, settings where the patient would be sedated or seriously ill. Under these circumstances, the patient would clearly not have the cognitive capacity to participate.

POTENTIAL PATIENT INVOLVEMENT DURING AND AFTER TRANSFUSION

Recording

During the transfusion itself, patients could make sure that their observations (eg, blood pressure, pulse, temperature, and respiratory rate) are taken at regular intervals as required and can notify health care professionals if this is not done. This of course depends on the extent to which patients understand the transfusion process and what to expect.

Responding to an Adverse Event

The final point at which there are opportunities for the patient to participate is by responding to a transfusion-related adverse event. If patients feel unwell, they can report this to a health care professional so that prompt action can be taken to mitigate the effects. Patients need to be informed that they are expected to do this—obviously, they can only do this if they are conscious and aware that a transfusion is taking place.

IMPLICATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

There are a considerable number of ways in which patients might be effectively engaged in the transfusion process. In our view, the main priorities for research in this area are as follows:

- *Consent:* Patients' attitudes toward consent and information provision could be examined. Patients often have little memory of the consent process or of any information being provided. However, we do not know whether they were not given information or simply did not remember it.
- *Shared decision making:* Transfusion may be offered when it is not strictly necessary, and the risks of transfusion may outweigh the potential benefits. We could explore how patients, being generally more risk averse than clinicians, can be effectively engaged in transfusion decisions.
- *Effectiveness of information leaflet:* Although current patient-focussed initiatives (eg, leaflets) are well intentioned, there is a significant lack of literature to indicate their effectiveness in terms of (1) imparting knowledge useful to patients, (2) encouraging patient involvement, and (3) reducing rates of transfusion-related complications and improving transfusion practice as a result of patient involvement. In addition, and perhaps more importantly, the extent to which patients know about these initiatives and would be willing to adhere to the recommendations remains to be discovered.
- *Perception of risk:* Patients' attitudes to transfusion-related information provision could be explored, including which sources of information they trust, because this can impact largely on patients' perceptions of risks of transfusions and their subsequent willingness to consent to the procedure. Research has shown that some patients have misperceptions about the safety of blood transfusion, but the extent of these misperceptions or how they influence willingness to have transfusions are unknown.
- *Framing of safety information:* Message framing may be a useful technique for presenting information about the risks of transfusion—preliminary evidence has shown that gain frame results in higher levels of confidence about the safety of blood transfusions; this finding needs to be replicated and investigated in more detail.
- *Potential adverse effects of patient information and involvement:* Although the timely provision of accurate, appropriate information seems a worthy aim, it may not be appropriate for all patients. We need to understand whether some patients are made unduly anxious by such information and how to deliver information selectively and appropriately.
- *Patient willingness to engage in safety checks:* Patient involvement in transfusion safety will not be appropriate for everyone. Factors that could affect patient involvement in the specific context of transfusion safety should be examined. Research within the wider paradigm of patient involvement in safety indicates that a number of factors will affect patients' willingness and ability to participate in transfusion-related behaviors. These factors include the patient (eg, knowledge and beliefs, demographics), the patient's illness (eg, stage and severity), the health care professionals involved in the patients care (eg, their knowledge and beliefs about patient involvement), the setting in which care is received (eg, ambulatory vs inpatient), and the specific task that the patient is required to participate in (eg, asking questions, checking procedures).[9] All these need to be explored in the context of transfusion.
- *Health care professional education:* In terms of health care professionals learning how to meet patients' expectations and delivering transfusion-related information in a patient-centered way, there is no better individual on how to do this than the patient themselves. Efforts therefore need to be made to investigate effective strategies that health care professionals, including doctors, can adopt to elicit and meet patients' transfusion-related needs. Implementation of the selected strategies for the different parts of the transfusion process will require further education and training of the staff carrying out that procedure.

Implications for Clinical Practice

There is considerable potential for patients to become more engaged in the transfusion process to provide both a better understanding of transfusion and to support better practice. More research is needed to assess how and in what activities patients might be engaged. However, the existing literature, sparse though it is, does suggest some immediate practical steps.

Patients want to be better informed about the risks and benefits of transfusion as well as the transfusion process itself. Hospital processes for providing information could be improved to ensure that information is routinely provided in advance of transfusion to those patients who are likely to be transfused. There should be similar processes for informing patients who are transfused in emergencies when they have sufficiently recovered. Hospital staff should be trained to provide information about blood transfusion and have the time to talk to the patient as well as handing out written material. New ways of making information more accessible using different media including the Internet should also be explored. Processes should be in place to document that information is provided and be subject to regular audit. Information should be available in different languages, appropriate to the local population.

A number of factors may perpetuate poor patient assimilation and retention of medical information. As well as ensuring information is readily available, it may be more effectively received if specific information is targeted for different types of patient, for example, for children and adults, and for different patient groups (eg, surgical, leukemia, sickle cell disease). The timing of providing information may also play a role in how it is received; for example, preadmission clinics may not be conducive to the retention of information or to provide the opportunity for asking questions as staff are often under time pressure. Likewise, the provision of information very close to the time of transfusion may not be optimal, as patients may be experiencing physical and/or mental distress from their illness that may interfere with their ability to retain information.

If patients are better educated about the risks of transfusion and the steps taken to minimize the risks, they will be able to make more informed decisions about the safety of their care and may have less exaggerated perceptions of risk. They may also be more willing to engage in measures to support staff to deliver good practice. Patients who receive regular transfusions and are already well informed may be the most willing to engage with staff in this way.

CONCLUSIONS

The concept of more active involvement of individual patients in steps in the transfusion pathway is a more complex issue than that of providing information to promote understanding. It requires detailed consideration and more research. How willing patients are to engage in transfusion procedures by challenging clinical staffs' decisions about the need for transfusion or to participate in the before-, during-, and after-transfusion safety checks remains to be determined. In addition, the extent to which clinical staff would be willing to be challenged or to support patient involvement in this context needs to be explored. With the lack of sufficient evidence, it could be argued that patient involvement might have the potential to cause delay, result in confrontation with clinical staff, and impair rather than improve practice. There is much work to be done before the effectiveness of active patient involvement in blood transfusion is determined and before specific measures can be implemented. We believe that this is a potentially important step in transfusion safety and, more widely, in ensuring that the provision of transfusion services is always centered on the needs and experiences of patients and their families.

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