Introduction

Ethics and transfusion medicine are at the crossroad of medicine and philosophy (or humanities), notably because blood is full of myths and symbols [1,2]. Several questions emerge when transfusion medicine is evoked; the scandals of contaminated blood are indeed still embedded in memories and have definitively changed our appreciation of dangers. Blood safety is based on five pillars:

- Infection-related safety based on epidemiology and monitoring of infectious risk;
- Immunological safety based on individualized or personalized transfusion medicine;
- Safety in procurement, to ensure a robust blood component inventory;
- Patient-focused blood management that aims to evaluate the needs of each individual patient;
- Ethics [3].

In this context, it is important to discuss the various ethical issues that the transfusion medicine community must face, because many different representations are associated with blood, blood components, and transfusion [1]. Many ethical aspects of transfusion medicine had already been...
addressed in the medical literature 40 years ago, notably the concerns of the Jehovah’s witnesses’ refusal of blood transfusion, the issue of religious faith versus medical ethics, voluntary and unpaid blood versus compensation or remunerated plasma donation in several countries, the concept of altruism (is it pure or is it based on some unsaid expectations? [4]), the sacred blood gift, blood doping and misuses of blood, and problems related to gift, exchange, and political economies of health care (should blood be bought and sold) [5-8].

History and development

The idea of taking blood from one individual to infuse it into another was developed in ancient Egypt. The word “transfusion” stems from the ancient Latin *transfundere*, which initially meant “to pour from one vessel to another”. Early on, its generally acknowledged meaning is extended to include two different notions: the corruption of a population by mixture with foreigners, with sexual and bread connotations; and the transfer of a debt [2]. Hence, the concept of transfusion as the transfer of the vital spirit or an idea was present before the definition of transfusion as the transfer of blood between two individuals.

Before transfusion of blood between different individuals, bloodletting was a common practice, and is still performed under very strict conditions [9] in patients suffering notably hemochromatosis [10], in some forms of porphyria [11] or polycythemia vera, which may be present in some blood donors [12]. Nowadays, discarded blood is traced all along the procedure and destroyed following regulatory requirements.

In some very strict cases, bloodletting in patients presenting with hemochromatosis can be converted into regular blood donation provided that the patient – turning to become a donor – volunteers and meets eligibility blood donation criteria [13,14]. At the present time, some investigators further suggest that bloodletting may prove useful to prevent type 2 diabetes in individual with high ferritin level, associated or not with hemochromatosis [15]. Bloodletting thus stands as a therapy in a limited number of medical disorders [16], and is no longer – by all means – proposed in mental disorders as it used to be in ancient times.

Blood donations are generally intended for transfusion into another individual which normally occurs in a context of mutual anonymity. However, these days, whole blood is no longer transfused; only blood components such as plasma, platelet concentrates or erythrocyte concentrates are transfused to patients. Paradoxically, “reconstituted” whole blood (high-volume administration of fresh frozen plasma, platelet concentrates, and red blood cells) is delivered in trauma patients [17]. A donor may also predeposit blood or blood products to cover his or her own prospective needs, notably for elective surgery. A third possibility is so-called “directed donation”, in which a donor gives blood to a particular recipient, notably when immunized patients need “rare” compatible blood.

An alternative to this not-for-profit policy is “compensated donation”, often used in Africa, in which a recipient receives blood under the condition that one or several of his or her relatives make(s) donation(s) to compensate for the blood component being issued. Laws in most Western countries prohibit this type of donation because it does not respect the voluntary and anonymous basis of donation and is often considered as an impingement to solidarity. In addition, and particularly if “rare” blood groups are needed, direct donation is organized between family members (most frequently brothers and/or sisters).

The main concerns of national health authorities regarding blood and blood components are to maintain an adequate blood and plasma supply for patients requiring transfusion, to ensure the appropriate use and warrant the safety of blood products, and to prevent the transmission of infectious pathogens [5]. Epidemiological studies performed in the Western world have shown that blood obtained from voluntary non-remunerated repeat donors carries fewer infectious agents – as deduced from biological markers – than blood from paid donors. However, this finding does not necessarily have universal or eternal value [18]. Data on the safety profiles of donors in Africa, Asia as well as from Latin America show that the prevalence of infectious diseases is different when compared to that of the Western and Northern part of Europe and the USA/Canada, plus Australia and New-Zealand. In addition, blood groups are very different in various ethnic populations [19,20]. Thus, and taking into account that blood donation must be though in an era of a globalized movement of people, ethics of blood donations certainly will be challenged in the next near future. Therefore, one should ask which value is to be prioritized between securing non-paid blood donations and providing blood to patients in sufficient quantity. Ethical judgment includes the balancing of two values (which, in a given context, may be conflicting) and the duty to evaluate the practical consequences of a choice. While respectable, the philosophical substrate intended by the concept of “solidarity” is linked to one’s culture and is not necessarily universal (even the best intentions can lead to catastrophic events, in some cases). If prohibition of family donations (e.g., in Africa) does not lead to a better and safer blood supply, but paradoxically worsens already existing shortages, then the ethical consequences of such a strategy also merit consideration [21,22].

Obligations and ethical considerations

In addition to the legislative straitjacket in place in most countries [23], in addition to the numerous documents edited by various scientific or governmental agencies describing all aspects involved in the different procedures to collect, prepare, secure, test, control, qualify, deliver and survey (vigilances) blood components, several organisms, notably WHO, as have prepared guidelines to delimit ethical procedures involved in
Ethics and blood donation: A marriage of convenience

Table 1
Websites of major organisms involved in transfusion medicine, presenting ethical issues related to blood donation

<table>
<thead>
<tr>
<th>Organism</th>
<th>Topics</th>
<th>Website</th>
</tr>
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<tbody>
<tr>
<td>ISBT</td>
<td>Ethics</td>
<td><a href="http://www.who.int/selection_medicines/committees/expert/19/applications/ISBT_Blood_Comment.pdf">http://www.who.int/selection_medicines/committees/expert/19/applications/ISBT_Blood_Comment.pdf</a></td>
</tr>
<tr>
<td>WHO</td>
<td>Voluntary non remunerated</td>
<td><a href="http://www.who.int/bloodsafety/voluntary_donation/en/">http://www.who.int/bloodsafety/voluntary_donation/en/</a></td>
</tr>
<tr>
<td>Council of Europe</td>
<td>Bioethics</td>
<td><a href="http://www.coe.int/t/dg3/healthbioethic/">http://www.coe.int/t/dg3/healthbioethic/</a></td>
</tr>
<tr>
<td>EFS</td>
<td>Ethical issues</td>
<td><a href="http://www.dondusang.net/rewrite/article/4778/efs/dossiers-thematiques/le-don-etique-un-choix-de-societe.htm?idRubrique=900">http://www.dondusang.net/rewrite/article/4778/efs/dossiers-thematiques/le-don-etique-un-choix-de-societe.htm?idRubrique=900</a></td>
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Blood donation (table 1). Despite all these texts, the well-accepted obligation of both transfusion medicine physicians and clinical/medical laboratory scientists at blood transfusion facilities is to provide in a timely fashion, to any patient in need of blood, blood components that are safe and best fitted to his/her clinical situation, and to secure the forthcoming donations and/or further transfusion recipient needs (notably by limiting the risk of allo-immunization). In order to accomplish this task, blood transfusion facilities must rely on donors, whose blood or blood components are collected in optimal conditions with the greatest respect for the donor, and with the commitment of making the best possible use of this gift. Globalization of the health market, merchandizing of the human body, and social inequalities must be taken into consideration when discussing blood transfusion. In the industrialized part of world, most blood donors are unpaid volunteers (voluntary non-remunerated donors; voluntary non-remunerated repeat donors) who donate blood for a community supply. Although many individuals donate as an act of charity, in countries that allow paid donation some “donors” (who should strictly speaking be renamed “sellers”) receive some financial compensation; in some cases, there are incentives other than money, such as paid time off from work [24,25]. In developing or recently industrialized countries, where established supplies are limited, donors usually give blood when family or friends need a transfusion (directed donation/reposition donors), with or without compensation. The WHO recognizes that achieving self-sufficiency “in the supply of safe blood components based on voluntary, non-remunerated blood donation, and the safety of that supply are important national goals to prevent blood shortages and meet the transfusion requirements of the patient population”. This issue is an important ethical aspect of blood transfusion [7,26–30]. A code of ethics of the International Society of blood transfusion (ISBT) is in place: it was developed over the 1970s, and is in place since the 1980s [30,31]. Very recently, in the journal “Blood transfusion” Farrugia and Del Bò brought the transfusion medicine community with some reflections on the ISBT Code of ethics [32,33], with emphasis on the tensions between the Code and commercial sources of plasma aimed to the preparation of plasma products, which is a source of debates from many years [33–36].

Globalization and merchandizing
Globalization of the market, merchandizing of the human body, and social inequalities must be also taken into consideration when discussing blood transfusion [37]. As already mentioned, whole blood can be eventually considered as a gift that is special in that it is a source of manufactured goods. Plasma collection by apheresis is more often the source of material designated for the industrial production of blood-derived drugs. Thus, in many parts of the world, individuals are paid to source plasma, which is then transformed into drugs. Globalization is really present in the market of blood products, and business-related companies may be considered the new vampires or new cannibals of neocolonialism. Immunoglobulins (which are high-priced but useful blood derivatives) represent an expanding market and profit is the driver in this domain. One may illustrate the situation as follows: the plasma of poor young individuals will be collected and treated to produce very expensive drugs that may eventually be useful for the elderly of the richest countries. This catastrophe scenario must be combated and condemned, as it violates all aspects of solidarity.
Ethical obligations towards donors

Donors generously give time and blood; they have the “right” to do so in optimal conditions of safety and comfort, and to receive acknowledgement, and respectful explanation in case of deferral. They also deserve the best possible use of their donation and to receive all needed information. However, the absence of remuneration does not imply that donors cannot have their travel expenses reimbursed. Indeed, not doing so might lead to social discrimination against the poorer blood donors. Offering donors tokens as signs of thankfulness, and making soft drinks and snacks available to them can hardly be seen as “payment” and is generally practised. Nevertheless, several individuals are totally opposed, for personal “ethical” reasons, to any kind of reward. This attitude is not understood by individuals having different cultural orientation [38]. For instance, the Middle Eastern culture of gift exchange would probably not orient donors in Syria into thinking that they were receiving the gift in exchange for their altruism. On the other hand, a Syrian graduate student who donates blood in a western context but receives nothing in return may tend to interpret the interaction as inhospitality. Clarifying the issues would greatly help in the interpretation of the notion of the “voluntary unpaid donor”. The Nuffield council on bioethics report on “Human bodies: donation for medicine and research” has provided specific terminology and a rubric, termed an intervention ladder, regarding transactions made in connection with human bodily material, including blood and plasma. A list of incentives has been published that includes the reimbursement of medical costs, compensation linked to loss of earnings, food vouchers, free physical check-up, time off from work (private sector), time off from work (public sector), reimbursement of travel costs, small tokens, refreshments, and other forms of incentives. Several notions such as “recompense” or “reward” have also been redefined: a recompense is a payment to a person in recognition of losses they have incurred, material or otherwise, and may take the form of either reimbursement of direct financial expenses incurred in donating bodily material (such as train fares), or compensation for non-financial losses (such as inconvenience, discomfort, and time). A reward is a material advantage gained by a person as a result of donating bodily material, which goes beyond providing redress to the donor for the losses they incurred during the course of donation. If reward is calculated as a wage or equivalent, it becomes “remuneration”. The approach of the Nuffield Council has been matter a discussions. Nevertheless, it allows us to envisage shifting attention away from the paid/unpaid donation dilemma towards making a distinction between altruistic and non-altruistic interventions. Altruistic interventions include information about the need for the donation of bodily material for the treatment of others or for medical research; recognition of, and gratitude for, altruistic donation through whatever methods are appropriate both to the form of donation and the donor concern; intervention to remove barriers and disincentives to donation experienced by those disposed to donate; and interventions as an extra prompt or encouragement for those already disposed to donate for altruistic reasons. Non-altruistic interventions include those offering associated benefits-in-kind to encourage those who would not otherwise have contemplated donating to consider doing so, as well as financial incentives that leave the donor in a better financial position as a result of donating.

Other ethical aspects: reflexion on discrimination/exclusion

Discrimination and exclusion represent the obscure face of blood donation [7,39]. Deferral is aimed at securing the blood transfusion circuit and minimizing the risks for transfusion recipients. The paradoxes of the exclusion of men who have sex with men are particularly difficult to address [40] without reflecting on the many and particular ethical aspects of the question [39]. Protecting public health is a legitimate public policy goal; however, permanently excluding gay and bisexual men, but not heterosexuals who have unprotected sex (and therefore pose an HIV risk), from donating is indeed questionable and is indeed questioned in several countries with revised criteria of deferral. The European Court of Justice has deliberated the case with no firm conclusion: the question of exclusion remains a concern of all individuals involved in the chain of events of transfusion medicine. The interpretation of exclusion of men who have sex with men is all but clear, and different solutions have been proposed in different countries [41,42]. Do people have the “right” versus the “opportunity” or even the “chance” – to donate? National regulatory authorities have established deferral criteria for donors with risk factors for transfusion transmissible infections, and in a position paper, have discussed the concerns over perceived discrimination and have questioned the scientific need for changes [43]. However, it is not the right of donation that should be discussed, but the right of patients to “benefit” from donated safe blood.

Conclusion

Although health systems have developed ethics, economics have their own ethics, as well. Blood components are expensive, and hospitals make every effort to limit the inappropriate use of such expensive blood components for clinical, ethical and financial purposes. In fact, blood or blood components obtained from voluntary non-remunerated repeat donors are not sold. The price of these “goods” is in direct relation to all of the services and activities that are directly or indirectly required, from the promotion of blood donation to the transfusion of a blood component, and surveillance – a long chain of processes that are all controlled and traced. Blood and blood components are considered economic items; they are necessary; they are costly; they are rare. The production and transfusion of blood components represent a cost to society.
Ethics and blood donation: A marriage of convenience

(and can thus be considered “valuable”); in addition, the number of available blood donors is limited. In this context, it is vital to ensure that the link between the transfusion community and public opinion remains transparent. Public opinion is not the supreme ethical criterion; however, given that donor recruitment and loyalty are critical to maintaining the blood supply, it is important that the transfusion community understands the ethical values and motivations that drive people in a given society. Reciprocally, the transfusion community has a moral duty to remain loyal to society, and to provide information that is as correct and understandable as possible to the general public regarding issues such as blood supply and product safety. Every decision in transfusion medicine should be based on critically examined scientific evidence, and not merely on personal or collective opinion. Decisions should be inspired by a willingness to work towards optimal protection of both the blood supply and product safety, and must not be beholden to the mere desire to avoid litigation. Every step that can reasonably be taken in donor selection or product testing or preparation should be encouraged. However, every measure of donor exclusion that is not based on sound medical evidence will only lead to further compromise of the blood supply.

Disclosure of interest: the authors declare that they have no competing interest.

References


