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LETTER TO THE EDITOR

Blood donation from brain-dead patients: Feasible and ethical?☆

Donación de sangre de pacientes en muerte encefálica: ¿factible y ético?

Sir,

In the early 1930s, S.S. Yudin successfully performed one of the first transfusions with blood from a dead donor[1]. The practice subsequently expanded, reaching Spain through Frederic Durán i Jordà and Norman Bethune — a clinician recently paid homage to in an article published in *MEDICINA INTENSIVA*[2,3]. Over the decades, however, improvements in preservation techniques and the decrease in military conflicts led to obsolescence and even rejection of this practice.

Although it cannot be affirmed that the Spanish Blood Bank is experiencing a sustainability crisis, this issue is becoming a problem in the United States[4].

In Spain, the National Transplant Organization manages solid organ, tissue and hematopoietic precursor cell donations on a centralized basis. In contrast, the donation of blood products is managed by the different regions (Autonomous Communities) in the country (RD 1088/2005) in accordance with the European guidelines (2002/98/EC). According to Law 30/1979, all Spanish citizens are to be regarded as organ and tissue donors unless they have explicitly stated otherwise (presumed consent). The mentioned Law specifies that ''this consideration does not apply to the therapeutic use of human blood and its products''. The donation of blood is seen as a ''voluntary and altruistic act'' (RD 1945/1985), with no mention at all of the situation of brain death (BD).

The question regarding the possibility of blood donation under conditions of BD does not seek to generate a conflict, on the understanding that blood donation should not be made before organ harvesting, since doing so would adversely affect the validity of the latter. However, it should be asked whether family rejection of organ donation ought to be extended to the donation of blood.

Most organ donations take place under conditions of BD. The percentage of rejections of donation is greater in BD than in non-heart beating donations. The reasons for such rejection include presumed rejection expressed in life (40.7%) and rejection on the part of the family (24%) — though other underlying factors may be distrust of the healthcare system, a lack of understanding of BD, the idea of cadaver mutilation, or the religious beliefs[5]. Despite some of these arguments, blood donation does not affect body integrity, and donation seems all the more reasonable if the individual involved has already donated blood in the past. In practice, blood donation would be a technically simple process in the Intensive Care Unit, where patient vascular catheters are already in place and close communication with a transfusion service is available. Likewise, the study of potential organ donors includes the tests necessary for the evaluation of blood donors.

Considering the above, we could raise several questions that may serve to open a broader debate: Could presumed consent be extended to include blood donation under conditions of BD? Would it be feasible to implement the logistics necessary to make blood donation under conditions of BD possible? Could donation be contemplated immediately after or during organ harvesting via erythrocytapheresis? Would we collect the usual 450 ± 50 ml, or could larger volumes be obtained?

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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Possible adverse effects of the blood donation from brain-dead patients☆

Posibles efectos adversos de la donación de sangre de pacientes en muerte encefálica

Dear Editor:

We have found the article published by Nanwani Nanwani et al.[1] on blood donation from brain-dead (BD) patients to be very interesting. It has opened a valuable debate on the clinical circumstances and ethical principles which should be revised in order to view this option as feasible. In our opinion, we must not obviate the close relationship between the progression of severe brain damage and the generation of hypermetabolic reactions and immune-mediated processes throughout the body. Brain death is the greatest stress factor to which organs, tissue and cells are exposed before possible donation, due to the generation of hemodynamic, ventilatory, endocrine and inflammatory modifications, mediated by an important neuromodulated inflammatory response.[2]

If in addition BD is reached secondary to severe traumatic brain injury, for example, we know that the elevated secretion of cytokines produces an increase in the concentration of brain tissue factor. This in turn activates the complement system, which in combination with important catecholamine release, contributes to perpetuating the coagulopathic state. Such rapid release of large amounts of tissue factor following severe traumatic brain injury also induces thrombin formation. Likewise, the systemic proinflammatory state is responsible for the activation of fibrinogen and IL-6, which together with complement activation would explain the hypercoagulability state that predominates in the first 24 h after trauma. On the other hand, platelet inhibition and consumption, together with the excessive activation of fibrinolysis, would account for the increased risk of bleeding in later stages after trauma.[3]

Taking into account that several studies have shown high plasma IL-6 concentrations in donors to be significantly associated with reduced recipient survival at 6 months after hospital discharge,[4] to what extent are we able to affirm that blood from BD patients will not be affected by this metabolic and immune cascade that is activated in patients with severe brain injury? From our perspective, current scientific knowledge does not allow us to be sure of the absence of immune-modulating effects in the recipients.

In turn, once BD has been established, it is common practice to administer amines, antibiotics and several different drugs to maintain donor clinical stability - and this undoubtedly could affect the theoretical quality of the blood components.[2]

We also must remember that during the organ harvesting and preservation process, vascular infusions are performed involving specially prepared fluids which seek to maintain homeostasis. These solutions contain additives (osmotic agents, electrolytes, colloids, metabolic inhibitors, metabolites, antioxidants and even drugs), and can have an impact on the presence of coagulation factors.[5] In this way, if blood extraction as suggested by the authors is performed during or after harvesting of the rest of body organs, we likewise would not be able to discard potential clinically significant alterations of the extracted blood components.

Coinciding with the authors on the importance of finding new resources and seeking solutions to the more than likely shortage of blood products which we may face, we believe that if this practice is finally implanted, it must be done so with extreme caution. Although the ethical debate is important, we feel that attention should focus on demonstrating the viability of using such blood products and clarifying the doubts regarding possible adverse effects.

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