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Improving strategy to reduce kidney transplantation waiting lists: type III non-beating-heart donors

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Spain has reached an important global level when it comes to transplants. Most donors in our country are brain death patients. Living donors represent a small percentage, although with a clear tendency to increase in the last years. Nonetheless, this high activity of obtaining organs is still not enough to fully cover the transplant needs of our country. The decrease in mortality due to trauma and cerebrovascular disease, together with the changes in the management of neurological patients in critical stages, are leading to a progressive reduction of potential brain death donors. For this reason, additional organ sources must be considered.

Cardiocirculatory arrest donors (CAD) might make a significant cohort of new potential organs that would allow us to reduce transplantation waiting lists. In some countries like the Netherlands, Belgium and Great Britain,[1,2] the number of cadaveric donors have doubled thanks to the introduction of CAD. Thus, in Great Britain CAD have gone from being 3% of the total number of cadaveric donors in 2000 to being 32% in 2009. We calculate that, if this tendency continues, by the year 2015 CAD will be the predominant group of donors.[2]

In Spain, obtaining these organs, basically from uncontrolled donors (Maastricht type II), began to spread definitively in the nineties after a few shy attempts in the eighties. This type of donor requires important coordination among the emergency outpatient services and the transplantation team. It requires the transplantation team to have a fast response capacity, which is why it has not been established in all centres.

Outside of Spain most of CAD are Maastricht type III, that is, patients who suffer massive irreversible brain damage but who do not fulfil all requirements for brain death. In them, death is certified by the ending of cardiopulmonary function after the decision of limiting life support treatment. Since Spain is a leader nation in the international transplant community, the use of this type of donor must be considered as a future option in most of our hospitals. After a period of reluctance, the National Transplant Organisation (ONT) has decided to promote the use of CAD after the recent publication of a consensus document written by experts.[3] Different European and American experiences show good results with type III donors,[4,8] thus their use in a country with high transplant activity, as Spain, should be implemented.

For these reasons, different centres have begun to establish their use and, among these, two successful experiences stand out: one in Hospital Carlos Haya, Malaga[9] and one in Hospital Puerta de Hierro, Madrid.[10] Both centres show that short-term evolution for this type of transplant is positive. This should encourage its establishment among the rest of the transplant community that is yet to implement this programme.

The challenges with this type of donors include identifying them, maintaining them and obtaining donation authorisation from the family. Another important fact is how to handle them and minimising the consequences of hot ischaemia. An interesting aspect is that this type of donation would not only benefit the possible recipient but it would also allow subjects who wish to donate their organs to do so in case of death without a need for brain death. The experience from Hospital Puerta de Hierro describes an excellent family acceptance of this type of donation.[10]

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We know that the criteria for admitting patients into the Intensive Care Unit are becoming larger, so that the increase in the complexity of patients makes mortality higher. Meanwhile, an important percentage of patients who pass away in these units do so after some form of life support limitation. Before establishing a programme for obtaining type III donors, we recommend to estimate how many patients have passed away in a given hospital after life support limitation and how many have died in the hours after making the decision, in order to estimate potential donors.[3] Whatever the case, experiences such as the one published in this number by Portoles et al.,[10] seem to find a higher incidence of patients capable of being type III donors than previously expected.[10] In this respect, a concern raised in the Anglo-Saxon world is whether type III donors can reduce the number of brain death donors.[11] Nonetheless, this problem has not come up in the short experience referred by Portoles et al, [10] or in other studies published.[12,13]

The ONT consensus document mentions that "considering organ and tissue donation after death should be an integral part of end of life cares in ICUs". This document clearly emphasizes that the decision for life support limitation should be prior to and independent from organ donation.[3] Action protocol must be based in the Recommendations for end of life treatment of the critical patient developed by the SEMICYUC bioethics group.[14] Prior to initiating this programme, it is important for the hospital to have a consensus protocol for life support limitation.

There are many comparative studies among renal transplants coming from CAD and brain death donors with variable results depending on the number and characteristics of donors.[6-8,15] The general opinion is that CAD transplant has a higher risk of not primary function and delay in initial graft function, although the latter does not seem to increase the risk of graft loss.[16-18] Another important aspect when it comes to predicting the viability of these organs would be exhaustive monitoring of hot ischaemia. Ideally, and as agreed in the ONT document,[3] monitoring should be based in hot functional ischaemia since its initial marker is the first episode that registers a systolic arterial tension (SAT) ≤60mmHg determined by invasive arterial monitoring and/or arterial oxygen saturation (O_2AS) ≤80 % determined by pulse oxymeter. Other studies are more permissive and set the limits of SAT at 50mmHg and O_2AS at 70%.[19] Collecting this data from patients rigorously is fundamental when it comes to evaluating results, as mentioned by Frutos et al[9] in their study. Another important aspect could be reducing, as much as possible, cold ischaemia. It is agreed that long periods of cold ischaemia are associated with higher risk of delays in renal graft function;[1,2] however, its impact over the viability of the graft is not clear given that some studies mention higher incidence on not viable grafts,[2] than others.[1]

An additional factor to regulate the delaying effect that ischaemia, especially hot ischaemia, can have over the organ is to evaluate carefully all comorbidities associated with the donor that may expand ischaemic damage such as diabetes, hypertension, peripheral artery disease and age. It will always be beneficial to implement certain *premortem* measures (like heparin use, vasodilator agents, etc.), early identification of the donor, reducing HLA typing times, etc.

In summary, the studies presented from two Spanish centres on type III CAD should encourage the rest of the transplant community to consider using such donors, keeping in mind that they require less organisational complexity and resources than uncontrolled CAD. Their results are positive and can help reduce transplantation waiting lists.

Conflicts of interest

The author affirms that she has no conflicts of interest related to the content of this article.

KEY CONCEPTS

1. Using type III CAD should be seen as a future option in most Spanish hospitals.
2. The results in patient survival and renal graft in CAD organ recipients are comparable to those of brain death donors.
3. Before the establishment of a programme of type III CAD organ extraction, is desirable that the hospital has a consensus protocol for life support limitation.
4. In this kind of donors, monitoring functional hot ischaemia is very important.

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