Circulatory Support as a Bridge to Pediatric Heart Transplantation

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Dear Editor,

The article "Use of short-term circulatory support as a bridge in pediatric transplantation", recently published[1] in *Arquivos Brasileiros de Cardiologia* has aroused great interest.

Caneo et al.[1] published the largest national experience with the use of circulatory support in children. The authors, according to the reported experience, demonstrated that the use of ventricular assist devices increased the possibility for children in cardiogenic shock to undergo transplantation, although mortality outcomes remained very high, according to international experiences.[2,3]

Although it is a noteworthy experience for Brazil, it is appropriate that some details should be observed.

About the risk stratification, for instance, Caneo et al.[1] grouped patients in Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS) 1 and 2 in the same category, which certainly results in differences in shock severity and therapeutic response.

More important than the initial assessment is the patient's response to treatment. It is absolutely necessary that the child have time for correction of multiple-organ dysfunction prior to the transplantation. Caneo et al.[1] had a mean time of 19 days to perform the transplantation in the group undergoing mechanical circulatory assistance, but one patient was transplanted within 6 hours! How do the authors manage the assisted child in relation to maintenance or not in the transplant waiting list? What are the recipient's minimum conditions to accept a possible donor during this circulatory assistance phase?

Resource allocation is limited in our country, so it is important to use them sensibly and in those with a better chance of survival. Additionally, the number of donors is insufficient to meet the demand of recipients. Wouldn't the use of a donor to a recipient in INTERMACS 1 and 2 be a waste of a donor to another recipient with better chances? Ethical dilemmas are certainly involved in this discussion.

I would like to congratulate Caneo et al.[1] for bringing such an important experience into the Brazilian cardiology community. Last but not least, the lack of availability of this technology in our country constitutes a serious problem, which must have the support of the competent entities, so that there is training and rationalization of use in heart transplantation reference centers.

Keywords

Advanced Cardiac Life Support; Heart Defects, Congenital; Heart Transplantation; Outcome Assessment (Health Care).

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Reply

Dear Editor,

The article "Use of short-term circulatory support as a bridge in pediatric transplantation" represents our initial experience with short-term circulatory assist devices, more precisely the use of both extracorporeal membrane oxygenation (ECMO) and the centrifugal pump for this purpose. The concepts and clinical management in this phase, explained in the manuscript, represented an important step in the development of our team. Although our mechanical circulatory support (MCS) program was started in 1999, only recently, after adequate investment in equipment and training of our staff, we achieved more favorable results with ECMO.[1]

Our recently published experience with pediatric heart transplantation (HTx)[2] shows that, until April 2012, we performed 114 HTx and used ECMO in only two patients. Over the past three years, however, there has been an exponential increase in that number and we performed more than 70 HTx using more than 25 MCS devices (unpublished data). Certainly, the use of MCS has contributed to this increase in volume, due the inclusion of borderline recipients, Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS) 1 and 2, not so well compensated clinically. Moreover, we observed a 70% increase in the number of congenital heart disease as a cause of HTx indication in our list. Our early mortality, which was consistent with the international literature,[1] increased as a result of the practice described above,[2] which made us review our protocols. Many of the questions raised in the letter sent by Atik had already been disscussed in our team.

It is known that short–term MCS devices was not designed to be used as a bridge to the HTx, and this is well emphasized in our manuscript, as well as the inherent characteristics of the Brazilian public health service, in which we do not have access to more appropriate devices. On the other hand, the mortality of these patients in the waiting list, according to our experience and before the advent of the MCS, was markedly elevated,[3] which led us to invest in the program.

Among the lessons learned, it is now known that patients that have some dysfunction in other organs, in addition to heart, are removed from the waiting list until the problem resolved.

The mentioned case that remained in the waiting list for a very short time refers to an acute failure in a patient already listed, who, after the setting up of the MCS, received an organ, in fact, is only an anecdotal case.

Currently, our service has launched the clinical protocol of the pneumatic paracorporeal ventricular assist device developed in our Department of Bioengineering, which is available in sizes 15, 30 and 65 mL for institutional patients. We live in a time of greater maturity in clinical management, anticoagulation and nutritional support with the use of these devices.

Regarding the ethical aspects mentioned in the letter, we would like to emphasize that the proper allocation of organs to these patients is a constant concern of our team. To consider the use of an borderline donor in unfavorable cases may be a viable alternative. By proposing the use of MCS to the family, we must keep in mind that we are not necessarily heading towards HTx and that will only be considered at the appropriate time. To recognize our limitations is part of the evolution of a high-quality MCS and HTx program.

Sincerely,

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