

Proposal to raise the donor age limit for pulmonary heart valves

Introduction

Currently, the UK Blood and Tissue Service's Donor Selection Guidelines specify an upper age limit of 60 for donors of all cardiovascular tissues. There is a discrepancy between this age limit and that applied by non-blood service banks, who apply an upper age limit of 65 for pulmonary heart valves, and in Germany where an upper age limit of 70 is applied (1). The purpose of this document is to propose that the Donor Selection Guidelines be amended to permit pulmonary heart valves to be donated by donors up to the age of 65 or 70, and to supply supporting evidence for this change.

Background

The current age limit of 60 applied to cardiovascular tissues is based on age-related degeneration of the tissue, principally the development of heavy atheroma and calcification, both of which are criteria for rejection of cardiovascular tissue for clinical use. These pathologies are also exacerbated by dietary and lifestyle factors. In practice, we find that the majority of aortic heart valves from donors over the age of 55 are unsuitable for clinical use, and there is clinical evidence to suggest that aortic allografts from older donors have reduced clinical performance (2). However, even in these donors the pulmonary valve is generally in a much better condition - we have never had to reject a pulmonary valve for clinical use based on age related degeneration, and this is a common experience to all heart valve banks in the UK.

Currently, pulmonary allografts are in much greater demand than aortic allografts due to their application in the Ross procedure, and to an increasing requirement for pulmonary patch grafts. This is borne out by the stock levels currently held in UK heart valve banks; as of December 2007, 212 aortic valves were available for issue nationwide, compared to just 11 pulmonary valves. Due to the age profile of tissue donors, small increases in age limits can have a disproportionate increase in the potential donor pool; based on 2006-2007 tissue donor referral patterns, increasing the donor age limit to from 60 to 65 would result in a 31% increase in pulmonary valve donation.

Evidence based justification

It is standard practice in non-blood service UK heart valve banks to bank pulmonary valves from donors up to age of 65, and verbal reports from these banks indicate that they do not encounter any problems with the quality of valves from these donors. A PubMed database search was performed using the search criteria 'pulmonary homograft [OR] allograft donor age' which identified 54 and 79 publications respectively. All English language abstracts were reviewed, and three publications identified where the clinical performance of the grafts had been related to donor age. Raanani et. al. (3) reported on the performance of pulmonary allografts in the Ross procedure, and found poorer clinical performance in valves from younger donors (donor age range stated as 39 +/- 12). In contrast, Settepani et. al. (4) reported that increasing donor age was associated with valve stenosis (donor age range 9-66), and Ryan et. al. (5) reported that donor age was not associated with valve stenosis (donor age range not specified).

Summary

Clinical data is somewhat sparse, however the balance of available reports (2 of 3) suggest that increasing donor age is not a risk factor for allograft deterioration. Other UK heart valve banks have been banking and supplying pulmonary valves from donors in this age range for several years now with no reports of poor clinical performance. Increasing the donor age limit for pulmonary valves will permit larger numbers of a graft for which there is a high clinical demand to be banked.

References

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