Rejected hearts now viable for transplantation after stress echo

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Hearts previously rejected due to donors' age or other risk factors can now be declared viable for transplantation using pharmacological stress echo, according to research presented at EUROECHO and other Imaging Modalities 2012. The study1 was presented by Dr Tonino Bombardini from Pisa, Italy.

EUROECHO and other Imaging Modalities 2012 is the annual meeting of the European Association of Cardiovascular Imaging (EACVI)2, a registered branch of the European Society of Cardiology (ESC)3. It takes place 5-8 December in Athens, Greece, at the Megaron Athens International Conference Centre.

Heart transplantation is an established procedure in patients with end-stage heart failure but it is limited by a severe donor organ shortage. The average age of organ donors has increased and the donor is frequently a patient who died of a stroke. Every year in Europe a pool of ~4,500 hearts for which permission has been granted for heart donation are unused4. "Many of these hearts could be used if we could increase confidence that the transplantation would be successful," said Dr Bombardini, who is scientific coordinator of the Aged Donor Heart Rescue by Stress Echo (ADONHERS) Project.

"Currently, the use of hearts from donors = 50 years (of the total transplanted hearts) is just 21% in Europe and 12% in North America," he added. "But the lengthening of waiting lists for heart transplantation is a significant healthcare emergency and as a consequence, the criteria for

acceptance of donor hearts have been expanded to include donors over the age of 55 years."5

Dr Bombardini continued: "Despite the expanded criteria, clinicians are hesitant to use hearts from older donors. The use of stress echocardiography to select hearts 'too good to die' may be a possible approach to resolving the mismatch between organ supply and demand."

During 2005 to 2012, the ADONHERS Project included 66 candidate heart donors who would previously not have been considered due to their age or other risk factors. The average age of candidate donors was 55 years. After a legal declaration of brain death, 47 donors were still considered eligible and underwent dipyridamole (n=44) or dobutamine (n=3) stress echocardiography to look for coronary artery disease or cardiomyopathy abnormalities.

The researchers found 35 hearts without heart disease that were therefore eligible for transplantation. For six of these hearts, a matching recipient could not be found and a cardiac autopsy verified the absence of significant coronary artery disease or cardiomyopathy abnormalities.

The remaining 29 eligible hearts were successfully transplanted in emergency recipients. At 1 month, 26 patients had normal heart structure and function as assessed by angiography, intravascular ultrasound, hemodynamic tests and ventriculography. Three patients had minor single vessel disease.

After a median follow up of 27 months, 26 patients had survived and 3 had died (from general sepsis, neoplasia and recurrent multiple myeloma).

Dr Bombardini said: "An upward shift of the donor age cut-off limit from the present 55 to 65 years is acceptable if a stress

echocardiography screening on the candidate donor heart is normal."

He added: "Pharmacological stress echo is inexpensive and allows a simultaneous evaluation of inducible ischemia and contractile reserve of the left ventricle – therefore, it is capable of unmasking prognostically meaningful occult coronary artery disease or cardiomyopathy."

Dr Bombardini concluded: "Pharmacological stress echo is already an established technique that is used to assess and risk stratify patients with known or suspected coronary artery disease. We have shown that it can also be used to identify hearts suitable for transplantation that would previously have been unused. This requires cardiologists with experience of stress echo and ideally a second opinion from a cardiologist in a core lab (using tele-echocardiography), who can give the green light for donation."

In addition to the above research, Dr Bombardini's group will present two further abstracts on this topic at EUROECHO 20126, 7.

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