Could deceased heart attack victims expand donor pool?

November 11 2013

Researchers from the U.K. suggest that using organs from donors after circulatory death (DCD) who also suffered a previous cardiac arrest out of the hospital environment could expand the pool of available livers for transplant. Results published in *Liver Transplantation*, a journal of the American Association for the Study of Liver Diseases and the International Liver Transplantation Society, show that using organs from selected DCD donors with pre-hospital cardiac arrest had no significant impact on graft or transplant recipient survival compared to organs from donors experiencing other cardiovascular death.

Similar to the U.S., the U.K. is impacted by a shortage in available livers for transplantation. The number of patients on the waiting list for liver transplant has steadily risen in the U.K., increasing the use of organs or grafts from donors after circulatory death. According to the National Health Service in the U.K. and the Organ Procurement and Transplantation Network in the U.S., the number of candidates on the waiting list for liver transplant is 494 (as of March 31, 2013) and 15,888 (as of November 10, 2013), respectively.

Guidelines from the British Transplant Society and the US-based Institute of Medicine state that organ donation may continue after five minutes of the absence of heartbeat (asystole). Prior research shows that warm ischemic insult linked to donation after circulatory death may increase early and late post-transplant complications compared to donation following brain death.

"A primary concern in using organs from donors who suffered a heart attack is the extra donor warm ischemia time—how long it takes to retrieve an organ from donors with non-beating hearts until blood supply ceases to circulate through the tissues (cold perfusion)," explains lead author Dr. Paolo Muiesan with Queen Elizabeth Hospital in Birmingham, U.K. "Our study examines outcomes in transplant recipients who received livers from DCDs, who also sustained pre-hospital cardiac arrest versus those that had not sustained pre-hospital cardiac arrest."

The research team reviewed data of livers or grafts transplanted between January 2007 and October 2011, identifying 108 donors after circulatory death—26 who suffered pre-hospital cardiac arrest and 82 with other types of injury, such as trauma or stroke eventually leading to being identified as potential DCDs. Donors with pre-hospital cardiac arrest had a median age of 51 years, a body mass index (BMI) of 24.9, intensive care unit stay of 2 days, and "downtime" of 20 minutes.

Analyses indicate that short-term outcomes for transplant recipients were more favorable using organs from donors with pre-hospital cardiac arrest than from other deceased donors. Long-term results show no significant different in graft or transplant recipient survival when using organs from pre- and non-pre-hospital cardiac arrest donors. Overall 30-day, 1-year and 2-year graft survival for all recipients of organs from cardiac death donors was 89%, 84% and 79%, respectively.

"Our transplant unit considers deceased heart attack patients who have liver enzyme levels (transaminases) less than four times the normal range to be suitable donors for liver transplant," concludes Dr. Muiesan. "Including selected DCDs with pre-hospital cardiac arrest could boost the donor pool with no adverse outcomes for liver transplant recipients."

More information: "Increasing the Donor Pool; The Consideration of

Pre-Hospital Cardiac Arrest in Controlled DCD Donation for *Liver Transplantation*." Ahmed H Elaffandi, Glenn K Bonney, Bridget Gunson, Irene Scalera, Hynek Mergental, John R Isaac, Simon R Bramhall, Darius F Mirza, MTPR Perera and Paolo Muiesan. Liver Transplantation; (DOI: 10.1002/lt.23772). doi.wiley.com/10.1022/lt.23772