Response to organ shortage: kidney retrieval programme using non-heart beating donors

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The dwindling number of organ donors is a major concern in transplantation.[1] As a result there has been a renewed interest in retrieving kidneys from asystolic or "non-heart beating" donors using in situ renal perfusion.[2,3] This report details our experience and results after one year in Leicester following the introduction of a dedicated programme to retrieve kidneys from non-heart beating donors.

Patients, methods, and results

Two sources of potential donors were identified. In the accident and emergency department patients aged under 65 in whom resuscitation after cardiorespiratory arrest or trauma had failed were referred to the transplant team providing not longer than 30 minutes without cardiac massage had elapsed. On the medical wards elective ventilation[4] of donors is not always possible if there are no intensive care beds. In these circumstances arrangements were made for in situ perfusion, on the ward, after death. Requests for donation were made only by a senior member of the accident and emergency, medical, or transplant team. When relatives were not available in the accident and emergency department in situ perfusion was started as a temporising measure and withdrawn if permission was subsequently not obtained. This aspect of the protocol was discussed with the local ethics committee and soundings taken in the local press to assess public response. No significant adverse correspondence was received.

In situ perfusion was performed as described by Booster *et al*[5] using a 16 French gauge double balloon triple lumen kidney transplant catheter (TXF Medical, High Wycombe, UK). A rapid 8 litre infusion of chilled (4°C) kidney perfusion solution (Soltran, Baxter Health Care, Thetford, UK) followed by a slower infusion at 75-100 ml/min was used to achieve renal cooling. Recipients were chosen using our normal criteria with age matching between donor and recipient wherever possible. The source of the kidney was not revealed to recipients, but centres to whom organs were exported were informed.

In the first year there were 27 referrals, 19 from the accident and emergency department and eight from the medical wards. The outcome of these referrals is summarised in the table. Technical errors were common due to misplaced catheters in diseased aorto-iliac vessels. A policy of *x* ray screening has been adopted to reduce the incidence of this problem. A request for consent was made in 22 cases with four refusals (18%). In situ perfusion was performed in 16 potential donors (median age 49, 14 men) with a median insertion time of 25 minutes (range 15-48). In six cases the perfusion was started before relatives arrived in the accident and emergency department.

Outcome of 27 referrals to the non-heart beating donor programme

	Ward (n=8)	A&E* (n=19)
Successful retrievals	2	7
Technical errors	2	5
Relatives unavailable	1	4
Relatives refused	1	3
Donor unsuitable	2	0

*Accident and emergency department.

Eighteen kidneys were successfully retrieved and 16 of these were transplanted (no suitable recipient for two). During the same 12 month period 26 renal transplants from conventional heart beating donors were performed. The non-heart beating donor programme therefore contributed 38% of all transplanted kidneys. Fourteen grafts (88%) functioned after an initial delay of 21 days (range 8-49) due to reversible acute tubular necrosis. The median serum creatinine concentration at two months after transplantation was 166 μmol/l (range 124-436). Two grafts failed, one due to a renal vein thrombosis and one due to ischaemic damage after a prolonged cathether insertion time of 48 minutes.

Comment

These results show that the retrieval of kidneys for transplantation from patients dying in the accident and emergency department and on medical wards using in situ perfusion can provide a valuable additional source of functioning grafts. A team with organisational, technical, and counselling skills is required. Careful selection of donors, sensitive handling of relatives, and rapid in situ cooling enables such a programme to be successful.

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1 Gore SM, Hinds CJ, Rutherford AJ. Organ donation from intensive care units in England. *BMJ* 1989;299:1193-7.
2 Ruers TJM, Vroeman JPAM, Koostra G. Non-heart beating donors: a successful contribution to organ procurement. *Transplant Proc* 1986;18: 408-10.
3 Castelao AM, Grino JM, Gonzalez C, *et al.* Long term renal function of kidneys transplanted from non-heart beating cadaver donors. *Transplant Proc* 1991;23:2584-6.
4 Feest TG, Riad HN, Collins CH, Golby MGS, Nicholls AJ, Hamad SN. Protocol for increasing organ donation after cerebrovascular deaths in a district general hospital. *Lancet* 1990;335:1133-5.
5 Booster MH, Wijnen RMH, Ming Y, Vroemen JPAM, Koostra G. In situ perfusion of kidneys from non-heart beating donors: the Maastricht protocol. *Transplant Proc* 1993;25:1503-4.

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Renal grafts from non-heart beating donors

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During 1990 in Britain 60·7 patients per million of the population were accepted for renal transplantation but fewer than 35 patients per million received a renal transplant.[1] More transplants would be available if non-heart beating donors were used.[2-4] We report a retrospective study of transplantation of renal grafts from non-heart beating donors.

Patients, methods, and results

From 1 September 1988 to 30 April 1991, 27 patients received renal transplants from non-heart beating donors and 70 from heart beating donors. Nine of the non-heart beating donors (who donated 18 grafts) had been hospice patients with primary cerebral tumours. The hospice's counsellors had sought consent both from the patients and from their relatives. During the terminal phase of their illness the patients received only the treatment indicated by their medical condition. After the patient's death the family was given time to be with him or her before the body was moved to the hospice's mortuary and the kidneys were removed. The remaining grafts came from people who had died after road traffic accidents or of myocardial infarction or subarachnoid haemorrhage.