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Multiorgan donation in the Netherlands: limited by consent and policy

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Abstract The percentage of multiorgan donors (MOD) versus single organ donors of kidneys only (SOD-K) has remained markedly low in the Netherlands compared to the other countries in the Eurotransplant region. This suggests a possible loss of donor organs. We investigated the causes of this persisting low percentage of MOD by studying the reasons for kidney donation only. All kidney donors in the Eurotransplant region in 1992 were studied retrospectively. In order to be able to make a comparison between all countries investigated, non-heart-beating donors and donors older than 55 years were excluded. Medical reasons were the most fre-

quent cause for kidney donation only in the Netherlands, but this was not significantly different from the other countries in the Eurotransplant region. Multiorgan donation in the Netherlands was restricted by upper age limits for heart and liver transplantation and by the consent system.

Key words Multiorgan donation, the Netherlands · The Netherlands, multiorgan donation · Organ donation

Introduction

Despite a well-equipped network of transplant coordinators, transplant centers, and the regionalization of organ procurement and facilities in the Netherlands, the percentage of multiorgan donors (MOD) versus single organ donors of kidneys only (SOD-K) was low in the past 5 years compared to other countries in the Eurotransplant region and to other European countries. In 1992 in the Netherlands, 44 % of all organ donors used were MOD. In the surrounding countries, this percentage was substantially higher: in Germany 56 %, in Austria 70 %, and in Belgium 72 % [2]. These figures suggest a possible loss of donor organs in the Netherlands, in addition to lower procurement rates per million inhabitants [5]. Therefore, we performed an analysis to detect the causes of this persisting low percentage of MOD in the Netherlands by studying the reasons for kidney do-

nation only here versus in the other countries in the Eurotransplant region.

Definitions and methods

A single organ donor of kidneys only (SOD-K) is defined as a donor from whom only one or two kidneys are used for transplantation. A multiorgan donor (MOD) is defined as a donor from whom, in addition to one or two kidneys, at least one other organ (heart, lung, liver, pancreas) is used for transplantation. Donors from whom organs other than kidneys were transplanted were excluded from this study.

All kidney donors in the Eurotransplant region in 1992 were studied retrospectively. Up until 1992, there was a strict upper age limit of 55 for MOD in the Netherlands, in contrast to other countries within the Eurotransplant region where organs from MOD older than 55 were transplanted. The Netherlands was also the only country in the Eurotransplant region to have a nonheart-beating (NHB) kidney procurement program. Therefore, in order to

Table 1 Reasons for single organ kidney donation in organ donors in the Netherlands in 1992 (*n* = 127)

Reason	Numbers
Age > 55 years	31
Contraindications for multiorgan donation	44
Circulatory instability/poor donor condition	21
Limited consent	16
Nonheart-beating donors	13
Logistics	1
Unknown	1

make a comparison with other countries within the Eurotransplant region, NHB donors and SOD-K older than 55 were excluded from further study. In all, 327 SOD-K 55 years of age or younger in Germany, 83 in the Netherlands, 39 in Austria, and 38 in Belgium were analyzed and compared with regard to the reasons for kidney donation only. Statistical analysis was performed using ANOVA.

Results

In 1992, kidneys were procured from 227 organ donors in the Netherlands, 100 of whom were MOD (44%) and 127 of whom were SOD-K (56%). No differences were found between the MOD and SOD-K with regard to mean donor age, sex, cause of death, or size of the donor hospital. In 31 of the 127 SOD-K, donation was limited to procurement of the kidneys for reasons of age only (donor age > 55). Medical contraindications for MOD and the occurrence of circulatory instability were the reason for SOD-K in 44 and 21 donors, respectively. Thirteen SOD-K were NHB donors (Table 1).

Table 2 shows the donor characteristics of all SOD-K 55 years of age or younger within four of the Eurotransplant countries. No statistical difference in the male/female ratio was found. The most frequent cause of death was direct head injury, except for Germany, where intracranial bleeding was slightly more common. These differences were not statistically significant. The mean donor age in the Netherlands, however, was significantly lower than in the other countries; no explanation could be given for this.

Table 2 Donor characteristics of SOD-K 55 years of age or younger in the Eurotransplant region in 1992^a

	Austria (<i>n</i> = 39)	Belgium (<i>n</i> = 38)	Germany (<i>n</i> = 327)	The Netherlands (<i>n</i> = 83)	
Male/female	27/12	24/14	211/116	47/36	NS
Age (mean ± SEM)	41.4 ± 1.8	37.4 ± 2.3	37.7 ± 0.8	31.7 ± 1.6	<i>P</i> < 0.001 ^b
Cause of death:					
– Direct head injury	19 (49%)	20 (53%)	135 (41%)	37 (45%)	NS
– Intracranial bleeding	13 (33%)	15 (39%)	147 (45%)	33 (40%)	NS
– Cerebral anoxia	5 (13%)	2 (5%)	29 (9%)	11 (13%)	NS
– Brain tumor	0	0	10 (3%)	1 (1%)	NS
– Other	2 (5%)	1 (3%)	6 (2%)	1 (1%)	NS

^a Data from Luxembourg not presented

^b The Netherlands vs other countries

Medical contraindications for organs other than the kidney and circulatory instability/poor donor condition were the major reasons for SOD-K in all countries: 54% in Germany, 73% in Austria, 78% in the Netherlands, and 81% in Belgium (Table 3). Restriction of consent to kidney donation only accounted for 19% and 16% of SOD-K in the Netherlands and Germany, respectively. In Belgium, this was true for 1% of SOD-K, whereas no limited consent was registered in Austria. Logistical reasons for kidney donation only were rare in all countries. No reasons were given for 27% of the SOD-K in Germany, 20% of those in Austria, and 8% of those in Belgium.

Discussion

The current donor shortage is a major concern for transplant candidates, transplant centers, and organ exchange organizations. The development of multiorgan harvesting techniques has improved the availability of such organs as the heart, lungs, and liver. By increasing the rate of multiorgan donations, more patients can receive transplants even with a limited number of organ donors.

An overall annual increase in the percentage of MOD has been observed in the Eurotransplant region [2]; in the individual countries, however, different percentages of MOD have been noted in the past years. What is striking is the persisting low percentage of MOD in the Netherlands (mean 42%) in the period 1987–1992 compared to the other countries within the Eurotransplant region. This is rather unexpected in a country with a close network of transplant coordinators, extensive public education, and a positive attitude on the part of the public towards organ donation [1]. Although there are differences in the organization of organ procurement and transplantation in the four countries studied, transplant centers in all countries are faced with an increasing number of patients waiting for a nonrenal organ transplant. The organ sharing within Eurotransplant emphasizes even more the need for optimal use of scarce resources and, thus, for an optimal rate of multiorgan donation.

Table 3 Reasons for single organ kidney donation in organ donors 55 years of age or younger in the Eurotransplant region in 1992^a

Reason	Austria (n = 39)	Belgium (n = 38)	Germany (n = 327)	The Netherlands (n = 83)
Medical reasons	73 %	81 %	54 %	78 %
Consent only obtained for kidney donation	0 %	1 %	16 %	19 %
Age	3 %	8 %	1 %	0 %
Logistics	3 %	2 %	2 %	1 %
Unknown	20 %	8 %	27 %	1 %

^a Data from Luxembourg not presented

In the Netherlands there was only 1 MOD out of 32 organ donors over 55 years of age. This MOD rate of 3 % is striking when compared to the 47 % in Austria, 26 % in Belgium, and 13 % in Germany. The reason for not using older donors for MOD in the Netherlands is directly related to the age limitation for nonrenal organ donation in Dutch transplant centers.

Medical reasons (organ-specific contraindications) were the main cause for kidney donation only in all countries in the Eurotransplant region in 1992. Circulatory instability was the reason for kidney donation only in the Netherlands in 22 % of the cases; this figure is comparable with that given in the literature [4]. The occurrence of circulatory instability is directly related to the pathophysiological changes after brain death. Standardized donor management, started immediately after brain death is confirmed, is reported to prevent the loss of MOD due to circulatory instability [3].

Family consent in the Netherlands and in Germany seems to affect not only the actual number of organ donors per million when compared to Belgium and Austria, which have a presumed consent law [2], but also

multiorgan donation, as reflected in the limited consent given by the relatives of SOD-K. In the absence of a presumed consent law, donation of organs and tissue must be requested. It has been shown that restricting the donation request to kidney donation only is many a physician's way of lessening the emotional stress during the donation request. In other cases, a request for multiorgan donation is followed by the relatives' consent for kidney donation only.

Not all factors that can influence the actual rate of multiorgan donation could be from our data. For instance, such factors as time pressure on the organ procurement team, availability of transport facilities, poor weather conditions, and decisions made by the transplant surgeon and/or transplant coordinator in each individual donor could not be studied in detail. These factors may have contributed to kidney donation only in the group of donors where no reason for kidney donation only was reported.

We conclude that multiorgan donation in the Netherlands in 1992 occurred only in donors 55 years of age or younger, due to the age limitations for transplantation of the heart and liver in the transplant centers in the Netherlands. The fact that potential donors between 56 and 65 years of age could not be used as MOD contributed to the lower percentage of MOD in that country compared to other countries in Eurotransplant. Medical contraindications were the main reason for kidney donation only, and this did not differ significantly between the countries in the Eurotransplant region. The family consent system in the Netherlands seems to be another principal reason for the low percentage of MOD. Future studies in individual donors may identify other, more subtle factors.

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