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An 11-Year Overview of the Belgian Donor and Transplant Statistics Based on a Consecutive Yearly Data Follow-up and Comparing Two Periods: 1997 to 2005 Versus 2006 to 2007

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ABSTRACT

Background. The Belgian Transplant Coordinators Section is responsible for the yearly data follow-up concerning donor and transplantation statistics in Belgium and presents herein a 10-year overview.

Methods. The procurement and transplant statistics were compared between 2 periods: Period 1 (P1, 1997–2005) versus Period 2 (P2, 2006–2007).

Results. The kidney and liver waiting lists (P1 vs P2) showed an overall decrease for a period of 2 consecutive years in P2; kidney (−170 patients; −18%), and liver (−83 patients; −34%). All other waiting lists (heart, lung, pancreas) remained stable. Mean ED further increased (P1 vs P2); 229 (P1) versus 280 (P2, +22.27%). Non–heart-beating donors were significantly (+288%) more often procured in P2. Mean donor age was 37.9 ± 17.8 years (P1) versus 46.5 ± 19.9 years (P2), and mean organ yield per donor was 3.48 ± 1.7 (P1) versus 3.38 ± 1.8 (P2). Overall transplant activity per million inhabitants increased 21.1%.

Conclusion. For 2 consecutive years, the Belgian statistics showed significantly increased donor activity with an impact on waiting list dynamics and transplantation. The mean organ yield per donor was not influenced despite an increased average age and change in reason for death.

AFTER THE FOUNDING of the Belgian Transplant Society (BTS) in 1993, the Belgian Section of Transplant Coordinators (BSTC) was officially installed in 1997. It has been responsible for data registration and follow-up concerning numbers if donors, transplantational, and waiting list subjects. Although organized as an transplant center based coordination model, the BSTC is legally obliged to promote and facilitate actions and initiatives to stimulate increased donor activity on a national level. Despite a weak presumed consent has installed for 22 years a strengthened version in February 2007, has created a prodonation culture in Belgian society. Constant awareness and promotion campaigns remain as important as the legal system itself. Since the official installation of the BSTC, Belgium has reported an average of 22–24 donors per million inhabitants. This number places the country within the top 5 highest donor numbers worldwide.

Various initiatives to improve donation have originated from the BSTC. Awareness programs within the Belgian government, schools, and medical profession have been directly supported by the BSTC. In May 2005, The Department of Health Care of the Belgian federal government installed BELDONOR the overall national awareness campaign to improve donation rates at various levels within Belgian society. Under the this campaign, the GIFT project is a special initiative to focus on medical support and donor

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identification. Meanwhile, the BSTC further improved and increased its supportive and educational efforts. Training for medical staff such as European Donor Hospital Education Program (EDHEP), on-the-target teaching from out of the transplant centers, and supportive interviews in regional and national media, are some of the examples of work by the BSTC. For that reason, beside the standard yearly data collection on waiting list, donation and transplantation statistics we performed a data analysis of 2 time periods to monitor the impact over the last 2 years of even more proactive policies toward organ donation awareness.

METHODS

Data collection in 1 centralized common data sheet included statistics on potential donor numbers, effective donor numbers, referral patterns by month, cause of death, type of donor, donor age, reason for denial of donation, mean organ yield per donor, percentage of effective donors per organ, number of transplants per organ, number of organ transplanted per million inhabitants, and overall impact on organ waiting lists. Because of the recent steep increase in potential and effective donors, we compared 2 periods: Period 1 (P1; 1997–2005) versus Period 2 (P2; 2006–2007). Data collection was based on numbers collected by various transplant centers, which were double checked with the official data which were accessible through the Eurotransplant database, via the member site of www.eurotransplant.nl. All statistical analyses were performed using SPSS 9.0; statistical significance was determined by $P < .05$. Tests used for the analyses included Fisher exact, nonparametric Mann–Whitney, and independent Student's t tests.

RESULTS

Waiting List Dynamics

Organ waiting list numbers of all active patients were compared on December 31 of that year. The average number of organs per year was calculated for the 2 time periods. Comparing P1 versus P2, the average numbers of registered patients were: kidney, 856 versus 853; liver, 138 versus 175. The decrease was significant comparing the steep constant increase until 2005 especially on the liver waiting list; for 2 years in a row of showed a decrease. For the first time the kidney and liver waiting lists showed an overall decrease for 2 consecutive years; kidney (−170 patients; −18%) and liver (−83; −34%). Comparing registrations per year, there was no significant difference although fever patients registered for P2 versus P1, which could suggest that the decrease was based on a lower incidence of new registrations. In contrast, there was a slight increase in registrations for P2. All other waiting (heart, pancreas) lists stayed stable, comparing both periods, with exception of the waiting list for lungs, which showed a small increase comparing P1 versus P2.

Donor Statistics

The mean potential donor number was 324 (P1) versus 521 (P2; +60.8%; $P = .01$). The mean effective donor number further increased (P1 vs P2): 229 (P1) versus 280 (P2) (+22.27%; $P = .03$). Non–heart-beating donors (NHBD) were significantly more often procured during the second period resulting in 17 NHBD procedures (P1) versus 66 NHBD procedures (P2; +288.81%; $P = .02$). The referral pattern per month was significantly higher: 27.08 (P1) versus 43.41 (P2; +60.3%; $P = .03$) with a steep increase in donors reported from non-university hospitals (+39.4%). The conversion rate, which is the percentage of actual donors among potential referrals for at least 1 clinically transplanted organ decreased; 60.9% (P1) versus 54.15% (P2; 11.08%; P = NS). The average effective donor procedures per million inhabitants were 22.6 (P1) versus 26.41 (P2; +17.31%; $P = .05$). The reasons for donation refusal were medical (based on medical record as well as on findings in-situ) 20.12% (P1) versus 30% (P2; +49.15%; $P = .01$), family refusal 16.4% (P1) versus 13.01% (P2; −20.73%; P = NS) and legal reasons (refusal in the state registry of by coroner) 2.14% (P1) versus 2.02% (P2; P = NS). Mean donor age was (P1) 37.91 ± 17.8 years versus (P2) 46.5 ± 19.9 years (+22.66%; $P = .03$). Mean organ yield per donor was (P1) 3.48 ± 1.7 versus (P2) 3.38 ± 1.8 (P = NS). The reasons for death comparing both periods were: traumatic brain insult (P1) 38.8% versus (P2) 34.3% (−11.59%; P = NS) and cerebrovascular accident (P1) 41.68% versus (P2) 51.86% (+24.42%); $P = .05$). Furthermore, since 2005, there has been a significant increase in NHBD procedures, especially during the second period, specifically, over 3 years in a row. The potential versus effective NHBD procedures were: 24 in 2005, 63 in 2006, and 84 in 2007 versus 8 in 2005, 28 in 2006, and 38 in 2007. The mean organ yield for the NHBD was lower compared with the heart-beating donor pool: 2.28 versus 3.61. The Belgian donor pool contributed a mean organ number to the Eurotransplant pool; of 795 (P1) versus (P2) 923 (+16.10%; $P = .02$), resulting in (P1) 76.44 versus (P2) 88.75 organs per million inhabitants respectively.

Transplant Statistics

Transplant activity per million inhabitants showed an overall 21.14%, increase from P1 to P2 ($P = .03$) organ-specific including 66.59 (P1) versus 80.67 (P2) change; kidney 37.6 (P1) versus 42.5 (P2); liver 16.6 (P1) versus 22.3 (P2); heart (+lungs) 8.75 (P1) versus 9.61 (P2); and lungs 3.58 (P1) versus 8.41 (P2). Comparing organ transplants performed per million inhabitants for both periods, there was a significant difference; (P1) 78.3 versus (P2) 85.41 ($P = .02$). Concerning living donation and the related transplant numbers P1 versus P2, there was a significant increase in living donor kidney transplants, (P1) 19.66 versus (P2) 41.5 (+111.21%; $P = .01$); but no difference in living donor liver transplant activity: (P1) 24.7 versus (P2) 23.01 (P = NS).

DISCUSSION

Belgium, with a 22-year history of proactive donor legislation, has reported an average of 24 donors per million inhabitants over the last decade. Although the legislation has often been seen as the only factor for these favorable

donor numbers, this paper clearly shows that other proactive policies can be of importance. Ever since the foundation of the BSTC under the umbrella of the BTS, it has organized many structured as well as other initiatives. We examined activity in 2006 and 2007, where in addition to the proactive initiatives, close collaboration was established with the federal government of health care through the BELDONOR campaign as well as the GIFT project for comparison with data from the period before founding of the BSTC in 1997. The impact on the waiting list dynamics showed a positive impact during the second period (P2). For the first time, the kidney and liver waiting lists showed an overall decrease for the 2 consecutive year period, which was in strong contrast with the increasing pattern over 9 years in P1. Knowing that the registration numbers during both periods did not change suggested that increased donor activity as well as greater utilization of available extended donor grafts may have positively impacted these data.

These findings were confirmed when examining various donor statistics. P2 was characterized by the use of more extended donors; death due to more than 50% CVA, 24% increased mean age, and 49%, increased medical refusal rate, suggesting offering of all potential donors regardless of comorbidity or medical history, an observation supported by the 39.4% significantly increased referral pattern from non-university hospitals. Refusal by relatives further decreased by 20.12%, suggesting that the proactive awareness campaigns had no opposite effect. Although data on donor characteristics suggested that more extended criteria donors were accepted during P2, there was a significant difference in mean organ yield per donor and a 16.10% increase in total transplantable organs per million inhabitants in the second period. More transplants were performed within Belgium during P2. We concluded, a positive impact during P2 compared with P1 based on more donor procurement activity. Proactive donor legislation together with local, regional, and national initiatives from the BTS and the BSTC on one hand, and a more official closer collaboration with the federal government and its department of health care, showed a positive impact on the already high donor and procedure numbers within Belgium. However, certain prudence is necessary not to overestimate this evolution; donor numbers fluctuate yearly.