

EVOLUTION OF ORGAN DONATION IN CENTRAL PORTUGAL 1994-2009. A CHANGE IN DONOR PROFILE

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Summary - Organ shortage remains the main limiting factor for transplant. This paper aimed to show how previous work contributed to improve organ donation rates in the central region of Portugal.

In the last few years we have made considerable progress in the donor donation field, but more can be achieved. The main problem is not the lack of potential donors but rather a failure to convert potential donors into actual donors. We present the results of the Transplant Coordination Team of Coimbra University Hospital (HUC) and its evolution in local, regional and national contexts in the period of 1994-2009.

Introduction

The increasing number of organ donors and transplantation activity in Portugal is a direct consequence of the high motivation and excellent collaboration of Intensive Care Units (ICUs) and of the continued work of Organ Donation and Transplant Coordination Offices.

In November 1993, a network of five Organ Donation and Transplant Coordination Offices (GCCT) was created in Portugal. Each GCCT works within a defined geographical area which includes other hospitals operating in liaison with each office. Our office – GCCT – HUC – exercises its influence in the central region of the country and Azores Island, with approximately 2.48 million inhabitants.

The main functions of the GCCTs are to coordinate the donation and distribution of organs and tissues in the transplantation process.

Recently, in mid 2008, the new National Transplant Or-

ganization (ASST) developed an additional new Network of Coordination besides the Organ Donation and Transplant Coordination Offices. It designated one Hospital Donation Coordinator or key donation person in each hospital with the conditions and probability for organ donation – ICUs. This new facility will make a good contribution to increasing the number of donors in the near future.

Material and Methods

The Transplant Coordinating Team – a director, a coordinator nurse (part-time) and a secretary – started its activity in Coimbra University Hospital (HUC) and in the other hospitals in our area in 1994. In 2005 our team added another nurse (part-time).

The HUC has a long history of organ harvesting in Portugal. The first kidney donation in a living donor (1969) and the first post-mortem donor (1980) were undertaken in this hospital. HUC was a pioneer in kidney, liver, pancreas and bowel transplantation in Portugal and runs the only paediatric liver transplantation program in the country (living and cadaveric donors).

The main goals of the GCCT during the period from 1994 to 2009 were:

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1 – To increase organ donation, especially organ donation for non traumatic donors in the HUC.

Frequent meetings were organized to sensitize and motivate health professionals (Neurology, Neurosurgery, ICU, Emergency Departments, etc.).

The aim of the plan was:

- a) To have a suitable place where potential donors could be maintained (as the ICU is usually full of patients).
- b) To obtain human resources to take care of donor maintenance.

Organizational changes, proposed by us a long time ago, were implemented by the present hospital administration in April 2008, concerning optimization of donation in medical donors. The new measures implemented were:

- Donors are maintained in the Emergency Room (no more than 24h) and, if more time is necessary, then moved to another suitable place.
- The hospital should enlist for support by one nurse, as early as possible after brain death is declared. This nurse takes care of donor maintenance with the supervision of an ICU medical doctor.

2 – To start participation in organ donation by other hospitals in the region of GCCT – HUC.

The major task was naturally to motivate health care professionals and hospital administrations to contribute to this common aim.

- a) For this, knowledge of the characteristics of the hospital – infrastructure, health resources, etc., was mandatory and the data were obtained. Then periodic meetings with the hospital administrations and with ICU directors were organized to analyze the problems of identifying potential donors and donor maintenance for expanding organ donations in those hospitals.

- b) In a second step training courses concerning brain death, donor maintenance, organ donation and transplantation were initiated to ensure health staff training. Some doctors (ICU, Neurology, Emergency) held a specific educational course – “Transplant Procurement Management” (TPM). Protocols within these hospitals were established to manage the organ donation and procurement process. We always give the feedback of the results of organs and tissues use to the hospitals ICUs and other collaborating services. Every year we publish our Annual Activity Report and send it to each hospital. We consider the measures undertaken very important to sensitize and involve health professional in the donation / transplantation process.

We studied the whole process of organ and tissue donation in the HUC and in other hospitals in our area between 1994 and 2009. We evaluated the change in the number of organ donors and donor profile compared to the activity of our GCCT over the years from 1994 to 2009.

Results

- During the study period we obtained 869 brain death donors and 891 cardiorespiratory arrest donors – used as tissue donors only. 2484 organs (1690 kidneys, 662 livers, 118 hearts, 6 pancreas, 3 bowels, 5 lungs) were procured as well as 3103 tissues (2239 corneas, 378 heart valves, 380 bones grafts and 56 skin grafts).

The number of brain death donors in whole the service area of the GCCT – HUC increased from 30 donors in 1994 to 112 donors in 2009.

The procurement index increased from 13 donors/pmp (1994) to 40.2 donors/pmp (2008) and to 45.2 donors/pmp (2009). The rate of multiorgan donations increased from 64% in 1994 (19 of 30 donors) to 75.5% in 2008 (71 of 94 donors) and 69.7% in 2009 (Table 1, Figure 3).

- In the HUC we had a significant increase in donors – from 23 in 1994 to 59 in 2009. The major increase was observed in the years 2008/2009.

	2007	2008	2009
HUC	30 Donors	46 Donors	59 Donors
	36.7 % non traumatic	60.9 % non traumatic	66.1 % non traumatic

The number of donors with a non traumatic cause of death (COD) has increased since 2008. In parallel in April 2008 the current hospital administration implemented organizational changes concerning the optimization of donation in donors without traumatic COD.

In 2007 out of 30 realized donors in the HUC 19 had a traumatic COD (63.3%) and 11 had a non traumatic COD (36.7%), but in 2008 out of 46 realized donors 18 had a traumatic COD (39.1%) and 28 had a non traumatic COD (60.9%). In 2009 out of 59 cases 20 had a traumatic COD (33.9%) and 39 a non traumatic COD (66.1%).

- Over the years the organ donation and procurement programme was extended to all 11 Hospitals in the area of the GCCT – HUC until 2008. In 1994 only one regional hospital with ICUs (CHC) contributed to organ donation besides the HUC (Table 1). We began organ harvesting in the Paediatric Hospital in 1995, in H. Ponta Delgada (Azores Island) in 1997, in H. Sta. Maria da Feira as well as in H. Viseu in 2000, in H. Castelo Branco in 2002, in H. Leiria in 2003, in H. Guarda in 2006, in H. Aveiro in 2007 and in H. Cova da Beira in 2008.

Besides the HUC only four Hospitals (Paediatric, Ponta Delgada, CHC and Viseu) have Neurosurgery Departments. Hospitals without Neurosurgery Departments report almost only donors with non traumatic COD. All

TABLE 1 - Distribution of age, cause of death (COD) and rate of multi organ donations (MOD) in realized donors from 1994 to 2009

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All donors	30	49	43	52	47	46	41	44	44	49	49	54	57	58	94	112
Donor age																
0-15 yrs	0	6	1	3	4	3	3	4	5	2	1	2	5	0	3	3
16-45 yrs	22	31	34	38	33	37	29	33	25	25	30	22	22	28	33	26
46-60 yrs	6	9	5	11	7	5	5	7	8	11	13	20	16	19	29	35
> 60 yrs	2	3	3	0	3	1	4	0	6	11	5	10	14	11	29	48
Mean (yrs)	34	31	32	32	31	29	32	31	35	42	40	43,5	43	45,3	50	55,2
COD																
Traumatic	25	36	38	45	42	40	34	35	35	34	27	30	26	34	30	35
	83%	74%	88%	87%	89%	87%	83%	80%	80%	69%	55%	56%	46%	59%	32%	31%
Non-traumatic	5	13	5	7	5	6	7	9	9	15	22	24	31	24	64	77
	17%	26%	12%	13%	11%	13%	17%	20%	20%	31%	45%	44%	54%	41%	68%	69%
MOD																
Multi organ donors	19	29	38	41	42	40	36	35	34	37	41	48	40	46	71	78
	64%	59%	88%	79%	89%	87%	88%	80%	77%	76%	84%	89%	70%	79%	76%	70%

organ retrieval has to be performed by the transplantation team of the HUC in all donor hospitals. The contribution of Donor Hospitals has increased since the beginning of organ harvesting in the regional hospitals (Table 2). Between 2002 and 2009 the rate of donations realized in regional hospitals – approximately 47.5% - compared to the HUC – 52.5 % - remained constant (Table 1).

- The profile of donors changed throughout the region. Until 2002, most donors were relatively young persons with a traumatic COD – correlating to the high death rate from road accidents (Table 1, Figure 1). Since then the number of donors dying from traumatic COD has

remained constant in a range of 26 – 30 cases per year while the number of donors dying from non traumatic COD increased from 9 (16,6%) in 1994 to 77 cases (68,7 %) in 2009. The age of donors realized increased over time with a higher absolute number and proportion of donors at an age of above 60 years (Table 1, Figure 2). In 1994 the average age of donors was 34 years and in 2009 it was 55.2.

During the study time the consent system was not restrictive in any aspect (National Registry of Non Donors). From the 2002 consultations made to the Registry an entry existed in only four cases of potential donors and we were not allowed to harvest any organ or tissues.

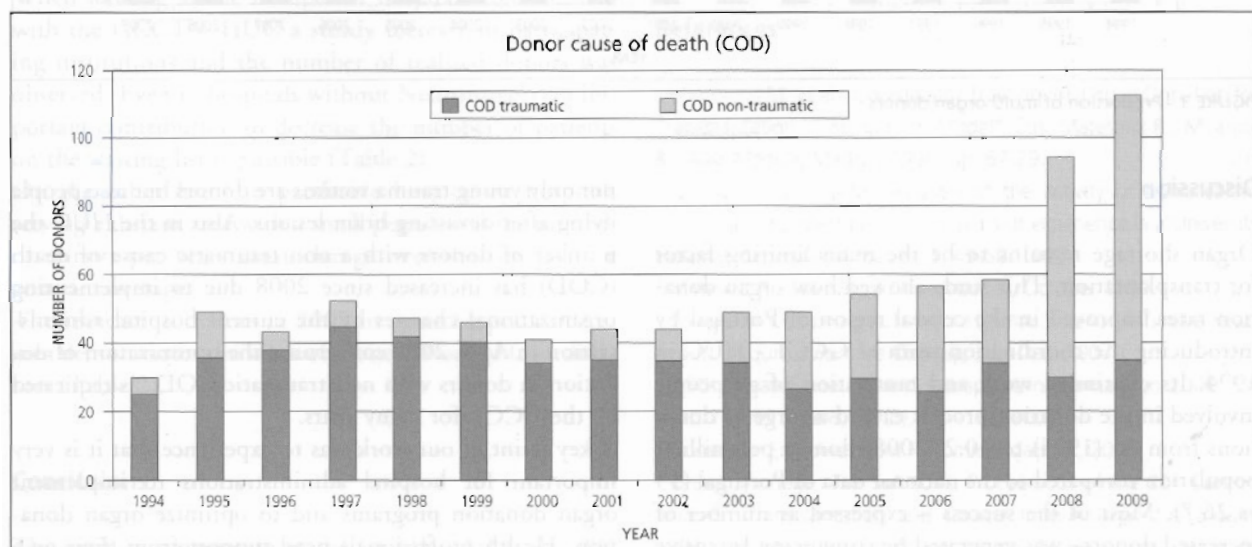


FIGURE 1 - Cause of death (COD) in realized organ donors in the area of the GCCT - HUC.

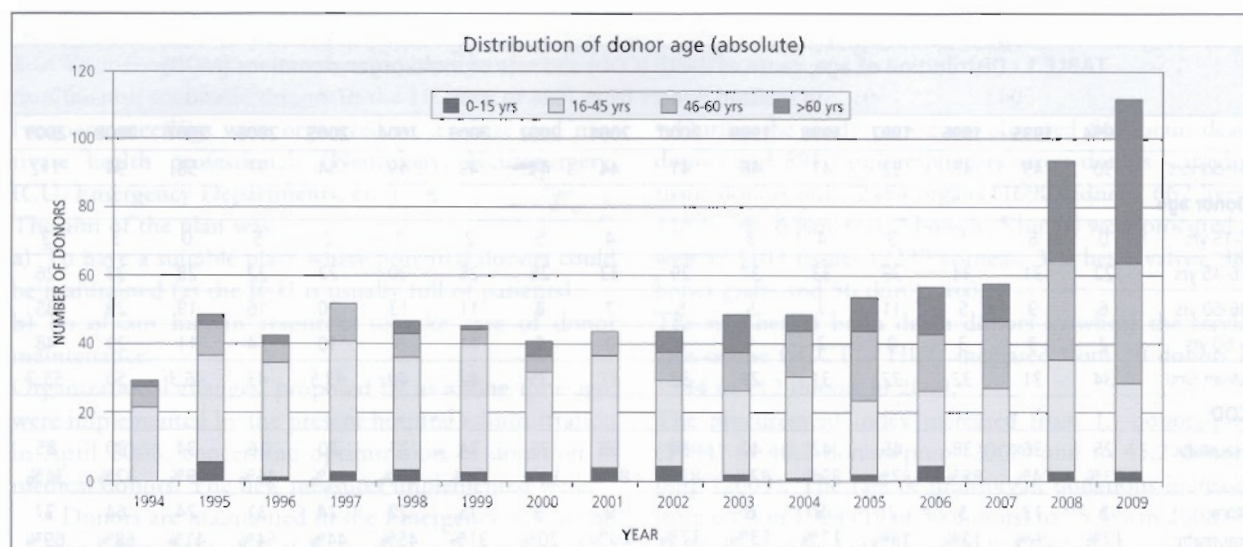


FIGURE 2 - Age distribution in realized organ donors in the area of the GCCT - HUC.

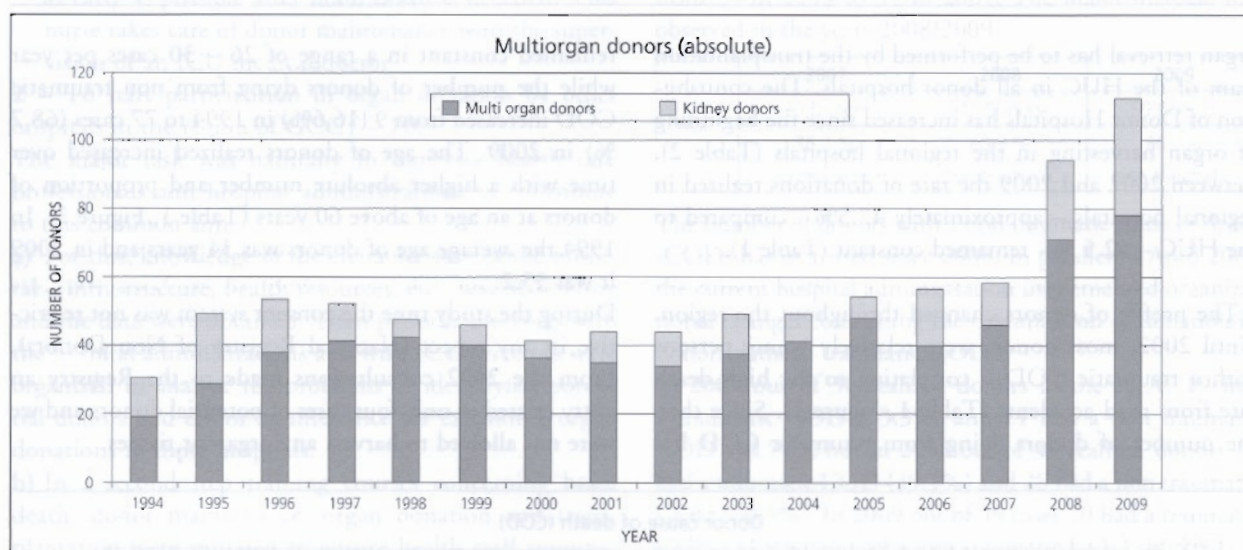


FIGURE 3 - Proportion of multi organ donors.

Discussion

Organ shortage remains to be the main limiting factor for transplantation. This study showed how organ donation rates improved in the central region of Portugal by introducing the coordination team of GCCT - HUC in 1994. Its continued work and motivation of all people involved in the donation process caused a surge in donations from 13 (1994) to 40.2 (2008) donors per million population compared to the national data of Portugal (15 vs 26.7). Most of the success – expressed as number of increased donors – was generated by convincing Intensive Care Units, Neurology and Emergency departments that

not only young trauma victims are donors but also people dying after devastating brain lesions. Also in the HUC the number of donors with a non traumatic cause of death (COD) has increased since 2008 due to implementing organizational changes by the current hospital administration in April 2008 concerning the optimization of donation in donors with non traumatic COD, as requested by the GCCT for many years.

A key point of our work was to experience that it is very important for hospital administrations to implement organ donation programs and to optimize organ donation. Health professionals need support from their own administrations in order to obtain the organizational

TABLE 2 - Participation of hospitals in the donation region of the GCCT - HUC

	2002	2003	2004	2005	2006	2007	2008	2009
HUC + *	23 52%	32 65%	27 55%	28 52%	34 60%	30 52%	46 49%	59 53%
Regional	21	17	22	26	23	28	48	53
Hospital	48%	35%	45%	48%	40%	48%	51%	47%
CHC +	4	2	10	7	2	11	12	11
H.Pediatrico +	5	2	0	2	4	0	2	2
H.P.Delgada +	2	3	0	0	0	0	3	6
H.Viseu +	7	8	10	11	12	7	15	8
H.S.Ma Feira	2	1	0	4	4	5	6	11
H.C.Branco	1	0	0	0	0	0	1	2
H.Leira	-	1	2	2	0	0	2	1
H.Guarda	-	-	-	0	1	1	0	3
H.Averio	-	-	-	-	-	4	3	7
H.Cova da Beira	-	-	-	-	-	-	4	2

* University Hospital (Donor and Transplant Hospital)

+ Hospitals with Neurosurgical Departments

structure that will make organ donation possible. This is emphasized by the increase in changing structures since 2007. However, the measurement of this observation by direct data is difficult. Convincing staff and implementing effective programs need time and bind resources of the GCCT with a return of investment years later. The change in structures and convincing staff includes the important information that there is no age limit in organ donation and all deaths leading to brain death – traumatic and non traumatic – must be included. This is an explanation for the increase in the donation rate in the area of the GCCT – HUC.

When looking at the number of hospitals collaborating with the GCCT – HUC a steady increase in participating institutions and the number of realized donors was observed. Even in hospitals without Neurosurgery an important contribution to decrease the number of patients on the waiting list is possible (Table 2).

On the other hand in paediatric hospital or hospitals serving a distant area with a small population the number of donors per years must change over the time with a constant average.

The increase in donors in 2009 in some hospitals of our area demonstrates the work of Donor Hospital Coordinators (Table 2).

Conclusions

The entry into operation of the GCCT – HUC in 1994 was the principal cause of the surge in donations from 13

donors pmp (1994) to 45.2 donors pmp (2009) (Portugal 15 donors pmp to 31.2 donors pmp). This work provided the possibility of harvesting 2 484 organs and 3 103 tissues that have been transplanted in our hospital and in several other hospitals in Portugal and in other countries.

The start of organ harvesting in nine hospitals and the increase in non traumatic donors in the HUC were the main causes for the results obtained.

Analysis of the results demonstrates the great importance of hospitals administrations in implementing organ donation programs and optimizing organ donation.

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