

The efficiency in the utilization of potential donors for organ transplantation in Riyadh, Saudi Arabia

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ABSTRACT

Objective: Organ transplantation programs have been successful in the Kingdom of Saudi Arabia. This success is limited by organ shortage. The aim of this study is to find out the percentage of actual donors out of all potential donors in intensive care units (ICU), and to look at problems related to the donation process, particularly from the logistical point of view.

Method: The study was conducted prospectively for a one year period, June 2001 through to May 2002, in 4 main Riyadh hospitals. Mortality data was collected by a medical professional in each ICU and analyzed on a weekly basis. Final analysis was made at the end of the year.

Result: Five hundred and forty-two deaths occurred in these ICUs. Fifty-four percent occurred in one hospital. The number of brain death cases in all hospitals was 114 cases.

Thirty-eight cases were reported to the Saudi Center for Organ Transplantation (33%). Documentation was completed in only 23 cases (60%). In these, there was a significant delay in documentation (second test was carried out in 6-12 hours in 4 cases only).

Conclusion: We have found that the reporting of brain death cases was low (33%). Dealing with the reported cases is inefficient since only 4 cases were able to become the actual donor out of 38 cases. We found also that there is a gross difference in the number of brain death cases among different hospitals. To improve the efficiency of ICUs in dealing with brain death cases (reporting, documentation, maintenance and consent) will require solving several problems at the medical, administrative, and religious and mass media levels.

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Organ transplantation became the standard treatment for many patients with end stage organ failure since the mid eighties.^{1,2} Organ transplant programs in the Kingdom of Saudi Arabia have been successful since the early 90s.^{3,4} The limitation has been organ shortage. Cadaveric organs remain the main source of organs despite the advances in utilizing living donors. The maximum utilization of donors was achieved in many countries through studying the magnitude of the problem of organ shortage, planning and implementation of strategies to try to utilize every single donor.⁵ In KSA,

organ transplantation has been successful over the past 2 decades. Such success was limited by organ shortage.⁶ In order to put this problem in true perspective, the first step will be to quantitate the number of potential donors and study factors that are limiting the proper utilization of these donors for organ transplantation.⁷⁻⁹ In this study we look at the situation in 4 of the main hospitals in Riyadh, KSA. All the deaths in the intensive care units (ICU) were recorded. The potential donors were studied to find reasons for the non utilization of these donors for organ transplantation.

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Methods. The study was conducted prospectively for one year, June 2001 through to May 2002. Four hospitals in Riyadh, KSA were selected for the study. These were (King Faisal Specialist Hospital and Research Center, Riyadh Medical Complex, Armed Forces Hospital and Security Forces Hospital). Official permission to access the records of the ICU was made as part of a national study sponsored by King Abdul-Aziz City for Science and Technology (KACST). A research assistant was employed in each of these ICUs who collected data on a weekly basis, which was then sent to the coordinator of the study who in turn will ascertain the completion of the information. Data obtained to include age, sex, diagnosis, ICU stay and cause of death of all mortalities in the ICU. From these information cases of potential donor were studied. Inclusion criteria of potential donor are: cases of head injury, cerebrovascular accidents (CVA), hypoxic brain damage and brain tumors. Only cases, which were stable enough to stay more than 48 hours in the ICU, were included. Patients with sepsis or malignancies were excluded as well as age above 65. The number of potential donors was recorded. Cases, which were reported to the Saudi Center for Organ Transplantation (SCOT), were studied in terms of documentation and whether the family was approached. Finally, the final number of actual donors whose organs were harvested was noted.

Results. The total number of death of all causes was 542 in the 4 hospitals. Most of the deaths were above the age of 60 (43%) with male to female ratio in this age group of approximately 3:1. **Table 1** summarizes age, and sex of the studied population and **Table 2** summarizes the reason for the non-utilization of all potential donors in relation to each hospital. Based on the above-mentioned criteria, potential donors were 114, which is 21% of the total ICU deaths. The reported cases were only 38 (33% of the potential donors). These reported cases were not all fully documented. The first and second clinical examination, electroencephalogram (EEG) and apnoea test were completed in only 23 cases (61%). In these 23 cases, only 4 had their second test performed less than 12 hours after the first test and the family was approached in 17 cases (74%). Consent was obtained in 4 cases only (24%).

Discussion. This is the first study in KSA looking into the size of the donor pool and the efficiency of referring donors for organ transplantation. Major hospitals in Riyadh, KSA were selected in this study. We identified 4 stages in the donation process where potential donors were lost: a) non-identification of patients as potential donors; b) incomplete diagnosis or failure of completion of documentation of brain death; c) failing to ask the family to donate; and d) families' refusal of consent to donation. The result of the study clearly indicates inefficiency in referring donors (only 33% of donors were reported). Our study did not address

Table 1 - Mortality in the intensive care units of the 4 studied hospitals between June 2001 and May 2002.

Age range	Male	Female	Total
0-10	15	3	18
10.1-20	18	10	28
20.1-30	43	18	61
30.1-40	44	13	57
40.1-50	65	11	76
50.1-60	38	33	71
Above 60	142	89	231
Total	365	177	542

Table 2 - Potential brain deaths compared with all mortalities and reported cases.

Hospitals	All mortalities	Potential brain death	Reported brain death cases
RMC	291	93	23
KFSH&RC	49	4	4
RKH	94	12	8
SFH	108	5	3
Total	542	114	38
RMC - Riyadh Medical Complex, KFSH&RC - King Faisal Specialist Hospital & Research Centre, RKH - Armed Forces Hospital, SFH - Security Forces Hospital			

the reasons for the lack of reporting of all brain death cases. It is expected that the attitude of the ICU personnel and hospital staff towards organ donation plays a major role^{10,11} as well as the absence of enforcing legislation for the mandatory reporting of donors in the health care system of the KSA. In the United States of America similar studies indicate non identification in 10-47% of donors in medically suitable donors compared to 67% in our study, which is quite high compare to other studies.¹²⁻¹⁶ The next step in the donation process is documentation. This is carried out by applying the protocol of the Saudi Center for Organ Transplantation. This protocol mandates the performance of 2 sets of clinical examination, at least 6 hours apart. An EEG is carried out after the first test and if flat, an apnoea test is then performed. The process is carried out by 2 physicians. This strict protocol was not completed in 40% of the reported cases in our study,

indicating another reason for losing more donors. Our study did not address the reasons for the lack of documentation, however, we expect that the lack of documentation is related to inherited defects in our health care system such as inadequate manpower, lack of motivation, lack of equipment for example. We found also that in only 4 cases out of 23, the second set of clinical exam was carried out in less than 12 hours from the first test indicating a significant delay in completion of the brain death protocol which can adversely affect the medical condition of the donor. The third reason for the loss of potential donors is the lack of adequate medical care. This was not studied, however, published data from the KSA indicates that more than 50% of the donors are lost due to lack of proper medical care leading to worsening of the medical condition of the donor and eventually, deterioration of the condition of the organs.¹⁷ Our study indicates also that 25% of the suitable fully documented donors are not approached for donation. From our study, It is clear that not only the high refusal rate is to be blamed for the organ shortage but also obstacles in the donation process have a big impact on such shortage. Even at the current consent rate of 10-20%,⁶ it is very likely that improving the donation process will have a substantial impact on the eventual number of actual donors. Suggested strategies include: a) mandatory legislation for reporting of donors, periodic check of hospital mortalities and education and incentives to the intensive care personnel. b) revision of the protocol for documentation to make it more practical and increase the efficiency of brain death diagnosis in the major hospital. c) education and training of personnel at ICU to be able to deliver a better care to the donor. d) training and the employment of donor coordinator in the major hospitals to help in the logistics of all the stages of the donation¹⁸⁻²¹ and above all reforming the organizations in charge of the donation process in KSA which, can result in a dramatic change in organ donation as experienced in other countries.⁵

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