Knowledge and Attitude Toward Brain Death and Organ Donation Among Anesthesiology and Reanimation Professionals

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ABSTRACT

Purpose. We aimed to establish the basic data for the improvement of the weak points by determining the knowledge and attitude of professionals in anesthesiology and reanimation or/and intensive care, who are 50% responsible for the diagnosis of brain death.

Methods. After the approval of the ethics committee, questionnaires were sent to participants. The data were collected electronically. The questionnaire consists of 89 questions.

Results. A total of 564 (22.56%) completed questionnaires were returned. The sex distribution of the respondents was 207 (36.7%) female and 357 (63.3%) male; the mean age was 37 (SD, 7) years. Among participants, 87.2% reported needing ancillary testing for the diagnosis of brain death. Nevertheless, the rate of those who never needed ancillary testing was high among the participants who were specialized and working in hospitals covered by Erzurum RCC (31.2% and 26.7%, respectively) ($P < .05$). A total of 55.3% of respondents reported considering brain death and 41.9% reported considering circulatory arrest at the time of death. Participants' religious beliefs are not against to organ donation (93.4%). However, the percentage of respondents who thought that families refuse organ donation because of their religion was 84.1%. Suggestions for increasing organ transplants from deceased donors include education (54.1%), religious support (21.4%), use of media resources (25%), government support and legislative changes (10.1% and 7.6%, respectively), and education of health workers (9.4%).

Conclusion. The most important way to solve this problem is to give adequate education to main stakeholders. This is the most effective method to improve the public's behavior.

TRADITIONALLY, death was considered equivalent to the cessation of breathing. After discovery of the stethoscope in the early 1800s, death was described as the discontinuation of the heartbeat. In the 1950s and 1960s the developments of resuscitation and mechanical ventilation, the establishment of multidisciplinary intensive care units (ICUs) under the leadership of Björn Ibsen after the polio epidemic in 1953 [1], and the development of resuscitation and positive pressure ventilators led to the ability to sustain breathing and circulation in patients who have lost brain function. There was also the inclusion of neurologic criteria in the definition of death [2]. Thus, the new definition of death is "the irreversible loss of respiratory and circulatory functions or the irreversible loss of all brain functions, including the brain stem." In 1968, a group of distinguished clinicians and neuroscientists from the ad hoc committee at Harvard University stated "irreversible coma is the new criterion of death" [3].

The first successful kidney transplant in the world was performed in Boston on December 23, 1954, by Joseph Murray. It was carried out between 23-year-old twins [4,5]. Organ transplantation in Turkey started with failure of

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heart transplants in the 1960s. In 1975, the first successful organ transplant was achieved by Dr Mehmet Haberal in which a mother donated her kidney to her son [4,6]. Law No. 2238 of June 3, 1979, *Harvesting, Storage, Vaccination and Transplantation of Organ and Tissue* was the first legislation in Turkey toward determination of death and organ transplantation [7,8]. In Turkey, parallel with the developments in the process, occasional changes have been made in the legal arrangements. In *Legislation of Regulation on Organ and Tissue Transplantation*, which was published with the latest changes on February 1, 2012, the definition of brain death is as follows: "Brain death is a clinical diagnosis; complete and irreversible loss of brain functions," and detailed brain death criteria are included. The legal obligations of professionals in anesthesiology and reanimation have doubled as a result of current changes in Law No. 2238 on January 18, 2014, which mandates that "The death is determined with the rules of evidence-based medicine by two physicians, one of whom is a neurologist or a neurosurgeon, and one of whom is a specialist in anesthesiology and reanimation or intensive care."

Treatment of some patients with end-stage organ failure is only possible with organ transplant. Diseases that cause end-stage organ failure are one of the major health problems in Turkey, as in other countries. Patients with organ failure, for lack of alternative treatments such as dialysis (heart, liver, lung), die in a short time if a healthy organ is not transplanted. One of the most effective ways for organ supply is to increase the number of brain death reports and deceased organ donations. According to 2014 data from the Council of Europe, deceased organ donation was 35.9 per million population (pmp) in Spain, 5.4 pmp in Turkey, and 25.3 pmp in France. This situation is the opposite in donations from living donors, with 9.4 pmp in Spain, 8.2 pmp in France, and 42.1 pmp. in Turkey [9]. It can be concluded that healthy individuals willingly donate organs to their relatives, but they do not donate organs of their relatives in whom brain death has occurred.

The aim of present study to determine the knowledge, tendency, and attitude about brain death and organ transplantation among anesthesiology and reanimation professionals, who are major influencers and have responsibility about this subject.

METHODS

After receiving approval from the Ethics Committee, the required approval was obtained from the Board of Turkish Anesthesiology and Reanimation Society, which has approximately 2500 members, and questionnaires were sent to the members periodically over the Internet from December 8, 2014, to January 24, 2017. The data were collected electronically. In addition, in the form of a printed questionnaire distributed at the meetings (eg, symposium, national congress, seminar, course), the lecturers were transferred to the electronic center.

The questionnaire consists of 89 questions:

- 1–14: questions about demographic data
- 15–32: questions about status and experience data (yes/no answer)
- 33–53: questions about opinions (in the form of 5 li Likert test)
- 54–70: questions about knowledge
- 71–84: questions about attitude

The 2 open-ended questions in the last section include the opinions and recommendations of the participants.

The Organ and Tissue Transplantation Services Department and National Organ and Tissue Transplantation Coordination System were established in 2000 to ensure coordination between institutions and organizations working in organ and tissue transplantation and to create the rules of transplantation. According to the system, the National Coordination Center is in Ankara and the Regional Coordination Centers are in 9 different regions that are distributed throughout the country (Ankara, Adana, Antalya, Bursa, Istanbul, Izmir, Diyarbakir, Erzurum, Samsun). The faculty from which anesthesiology and reanimation professionals graduated and the hospitals where they work were evaluated by classifying the regional coordination centers according to the regions they covered.

The results of the study were evaluated by an independent statistical expert (C. Afacan) using SPSS 24.0 Statistics package program (IBM, Armonk, NY, United States) for statistical analysis. Descriptive statistical methods (frequency, percentage) were used to evaluate the study data. Pearson χ^2 test and Fisher exact test were used to compare qualitative data. Results were evaluated with 95% CI, and $P < .05$ was the significance level.

RESULTS

A total of 564 (22.56%) completed questionnaires were returned. The sex distribution of the respondents was 207 (36.7%) female and 357 (63.3%) male; the mean age was 37 ± 7 years.

It can be said that the participants have knowledge about the current legislation on brain death and organ transplantation, and an average of 70% (range, 37.8%–94.1%) have a positive attitude toward it. The questions about the neurologic examination interval for adults and children who are younger than 2 months and older than 1 year were also answered correctly (72.9% and 68.8%, respectively). More than 90% of the answers that related to the apnea test are be correct. Despite the recent 2012 change to current legislation in Turkey, 81.9% of the participants knew that brain death is diagnosed by the decision of 2 physicians. However, 67% of the participants think that brain death is diagnosed with the same criteria in all European countries.

In our study, 87.2% of participants need an ancillary test for the diagnosis of brain death. Nevertheless, the rate of those who never needed an ancillary test was high among the participants who specialized and were working in hospitals covered by Erzurum RCC (31.2% and 26.7%, respectively) ($P < .05$).

Among participants 68.6% thought that supportive treatment of brain death cases whose organ donation was refused should be terminated. The rate was highest among those who still work in the hospitals covered by Diyarbakır BKM and among the participants who thought that intensive care treatment of brain death cases should be continued (38.5% and 10.7%, respectively) ($P < .05$). Almost 55% of respondents reported considering brain death and 41.9% considered circulatory arrest at the time of death.

The rate of participants who thought that their religious beliefs are not against organ donation (93.4%) was high. However, the percentage of respondents who thought that families refuse organ donation because of their religion or sect was 84.1%.

In our study, participants' attitudes were highly positive toward deceased donor and living organ donations (93.2% and 86.5%, respectively). They thought donation is effective and beneficial in terms of saving lives (97.7%).

In our study, 80.7% of participants wanted their relatives to donate their organs if brain death occurred. Participant requests to donate to family members who would need live organ donation varied according to the degree of relationship. The respective positive and ambivalent notifications about donation are 96.7% and 2.3% for children; 90.2% and 8.9% for mother, father, and sibling; and 86.1% and 11.7% for spouse.

Participants who had worked in the transplantation or organ procurement center at any stage of their education had positive attitude, and their knowledge was much greater than others' ($P < .05$).

The knowledge and attitude of participants who had experience in brain death diagnosis performed apnea tests, gave information to the relatives in brain death cases, follow up organ transplant patients in ICUs, are active in organ donation request processes, and have specific training regarding organ donation were higher ($P < .05$).

Participants answers for the questions "Why do you think cadaveric donations are less frequent than live donations?" and "What could be done to increase organ transplantation from cadaveric donors?" involve religious reasons (43.8%), lack of education (27.9%) and information (16.6%), lack of confidence in health care professionals (6.3%), failure to diagnose brain death (5.5%), and loss of integrity of the body (7.5%) as the most common causes that negatively affect deceased donor organ donation requests. Suggestions for increasing organ transplants from deceased donors include education (54.1%), religious support (21.4%), use of media resources (25%), government support (10.1%) and legislative changes (7.6%), and education of health workers (9.4%).

DISCUSSION

Each year 2000 people are diagnosed as brain dead in our country. Intensive care unit professionals try to tell their relatives that although their loved ones breathe with a device and the support of drugs, they are dead despite their heart beating [10]. As 25% of people diagnosed as brain dead can be donors, in this questionnaire study we attempted to determine information, tendency, and attitude about brain death and organ transplantation among anesthesiology and reanimation professionals, who are major influencers and have responsibility in this subject.

In this study, 65% of participants correctly answered the question about whether brain death is accepted as whole brain death according to law, 70% of participants correctly answered questions about the neurologic examination interval, and 90% answered correctly about apnea test. Also, 81.9% of participants answered correctly that diagnosis of brain death requires 2 specialist decisions. In a study among assistant doctors in India, 91.9% of participants know the definition of brain death, 80.4% know the right neurological examination interval time, and 53.6% know that the apnea test is compulsory. However, in this study, only 12.6% of participants know that an authorized team for diagnosis of brain death is required. In our study these are 65.8%, 70%, 90%, and 81.9%, respectively. In a study among medical students, different specialists, and ICU specialists by Lima et al, 19.5% of ICU specialists and 59.3% of other specialists do not know the correct criteria for brain death [11].

In accordance with clinical practice law, supportive tests that evaluate brain blood flow must be used to diagnose brain death. In a study by Sheerani et al in Sindh/Pakistan among health providers including medical students, 102 doctors (39%) accepted supportive tests for diagnosis and 135 doctors (52%) did not accept them. In our study, 87.2% of participants defined that supportive tests are needed to diagnose brain death.

Almost 69% of participants agree with terminating life support for people diagnosed as brain dead, but for whom organ donation was refused. On the other hand, 41.9% of participants point out that circulation should be considered for terminating life support. In study by Sheerani et al, 31% of participants disagree with terminating ventilatory support after brain death; 26% of them consider this to be euthanasia [12]. These treatments are defined as a futile effort in the modern health system except during pregnancy, during which life support must be maintained to keep the fetus alive. For this purpose there are support treatments until 100 days in the medical literature [13].

In our study, 93% of participants declared that their religious beliefs were not an obstacle to donation. On the other hand, participants indicated that the reason for the low rate of deceased donor organ donation is religious concerns. More than 1 in 5 participants answered the open-ended question and declared that religious clergy contribute to lack of organ donation. Religious clergy should be educated to encourage deceased donor organ donation. In a study by Gungormus et al in Erzurum, according to 33% of randomly chosen local people, religious attitude affects donation decision in a negative way. In a study in Istanbul among nurses and doctors in dialysis units, religious and traditional thoughts are main contributors to lack of donation. Similarly, in a multicenter study in Spain and Latin America countries, agnostic and atheist people constitute the largest part of favorable opinions (89%) [14]. Among religious individuals, the proportion of people who think their religious belief is not against organ donation was higher (83% vs 53%) ($P < .001$).

Most participants agreed with being a donor or living donor in case of necessity according to degree of relationship (for child 96.7%, mother and father 90.2%, husband or wife 86.1%). However, they were less willing to donate their

relatives' organs (66.1%). Sixty-six percent showed a positive approach to donate their children's organs, but 28% of them were indecisive. In a study in Australia among emergency doctors, most of emergency doctors (90%) approved of donating their own and relatives' organs after brain death, and 86.6% approved donating children's organs. However, another study of ICU workers (doctors and nurses) by Pelleriaux et al [15] showed that only 21.2% accepted donating children's organs; this was determined to be 94% among general practitioners in Belgium [16]. Dongmei Hu and Hai Huang researched among health specialists and determined that 42.1% of participants were willing to donate their relatives' organs, and 64.2% wanted to donate their own organs [17]. That percentage was 80.7% in the present study.

Most studies of tendencies in brain death diagnosis and organ donation focused on the education of health providers. In our study, inadequate identification of potential donors, delayed diagnosis or misdiagnosis of brain death, and misinformation given to the relatives of the patients were the leading factors that affect organ donation negatively. Education about brain death and organ donation must be increased among health providers, especially intensive care specialists who are major stakeholders in this process. Additionally in our study, the participants who trained on brain death and donation demonstrated a positive attitude, similar to that shown by Cohen et al [18] and Schaeffner et al [19]. Akgun et al emphasized the necessity of the education of whole health providers as it plays a major role in improving the attitude of the public concerning the subject. It was also underlined that lack of knowledge affects attitudes toward donation negatively, even among health providers [20].

Garcia et al showed that a positive attitude among health professionals can affect patients' relatives' decisions on organ donation, and medical students' attitudes can be changed positively after a comprehensive education regarding the subject [11,21].

CONCLUSION

Organ shortage is a universal problem encountered because of imbalance between supply of and demand for organs. Despite the potential for donation with 2000 brain deaths per year in the country, low rates of family permission stand against it.

The most important way to solve this problem is to provide adequate education to main stakeholders. This is the most effective method to improve the public's behavior.

Theoretical training about brain death and organ donation is beneficial when performed regularly and repetitively. Legislative regulations should be revised and explained to health care professionals clearly, and the questions should be eliminated.

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