

## ORIGINAL ARTICLE

## To assess the Concepts and Knowledge of "Brain death" and its usefulness in "Organ donation and transplantation" among registered medical practitioners in Vadodara city

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### ABSTRACT

**BACKGROUND:** Various parts of the brain may keep living when others die, and the term "brain death" has been used to refer to various combinations. Organ transplantation is the most preferred treatment modality for end-stage organ disease and organ failures. It is well known that registered medical practitioners are in continuous touch with the community on a daily basis, hence it is imperative that we check whether they have sound knowledge regarding brain death and organ donation and transplantation as they can aware large masses of community and gap of organ availability to patient in need can be reduced. **OBJECTIVES:** To assess the concept and knowledge of brain death and organ donation among RMPs of Vadodara city and spread awareness among them and then to community through them. **METHODOLOGY:** For the purpose of the study, a Knowledge and practice based pre-test and post-test questionnaire was used. Questionnaire consisted of 20 questions. The correct/positive responses was given a score of '1' and the wrong/negative responses '0'. Maximum possible score is 20. Upon discussion with the faculty of the Department of Forensic Medicine a score of 10 or more out 20 will be counted as aware or having correct knowledge and concept regarding brain death and organ donation. **RESULT:** The study dealt with 99 doctors which included 52 Allopathy doctors (52.52%), 21 Homeopathic doctors (21.21%) and 26 Ayurvedic doctors (26.26%). A number of 23 females (23.23%) participated from all the three field of practice. The level of awareness and correct knowledge amongst registered medical practitioners regarding brain death and organ donation before educational intervention was 64.64% and after educational intervention it increased to 90.90%. **CONCLUSION:** We conclude that there is significant increased knowledge of awareness about brain death and its usefulness in organ donation and transplantation after giving educational intervention to registered medical practitioners of Vadodara city.

**Key Word:** Brain death, Organ donation and transplantation.

### INTRODUCTION

Death is a universal but incompletely understood phenomenon, with strong connections to religious, spiritual and ethical beliefs. Accordingly the question of when a person is to be considered "dead" for legal or other purposes can be a lot more controversial and complex than it seems.<sup>1</sup> Somatic Death denotes the complete and irreversible stoppage of the circulation, respiration and brain functions (Bishop's tripod of life), but there is no legal definition of death. The question of death is important in resuscitation and

organ transplantation.<sup>2</sup> While the diagnosis of brain death has become accepted as a Basis for the certification of death for legal purposes. It should be clearly understood that it is a very different state from somatic death – the state universally recognized and understood as death.<sup>3</sup> Various parts of the brain may keep living when others die, and the term "brain death" has been used to refer to various combinations. For example, the distinctions between whole brain death and death of cerebrum can be important because, in someone with a dead cerebrum but a living brainstem, the heartbeat and ventilation can continue unaided, whereas in whole brain death (which include brainstem death), only life support equipment would keep those functions going. Patients classified as brain-dead can have their organs surgically removed for organ donation. Organ transplantation is the most preferred

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treatment modality for end-stage organ disease and organ failures.<sup>4</sup> Paragraph 22, of the 1983 Code of Practice, makes it clear that in regard to continuing medical practice on the patient, "Treatment must be for the patient's benefit." By keeping the patient alive it is not the patient who is benefiting, but rather the person receiving the organ donation. However, medical procedures can be given to an unconscious dying patient only with valid consent.<sup>5</sup> Many organs such as cornea, kidney, and liver are commonly transplanted to human recipients. However, the need for the transplants is high and the gap between organs available for transplantation and the number of patients waiting for a transplant is widening globally.<sup>6</sup> Similar to the developed countries, a situation exists in India where there is a chronic shortage of organs available for transplantation.<sup>7</sup> This shortage is primarily attributed to a limited number of organ donations in our country. A study from India, done in the last decade has shown that less than 50% were willing to consider organ donation.<sup>8</sup> The patients on palliative care can serve as source of organs and tissues. However, the systems and pre-requisites for successful organ donation among them are lacking.<sup>9</sup> Overall, there are many issues to consider taking into account in the debate of ethical values clashing with modern science. Where some say let the patient die due to the inability to cure or help them, others plead to keep them living either in desperate hopes of improvement, or in order to preserve their organs for future donation. The awareness about Transplantation of Human Organs Act-1994 in India is low. In some countries (for instance, Spain, Poland, Wales, Portugal, and France), everyone is automatically an organ donor after diagnosis of death on legally accepted criteria, although some jurisdictions (such as Singapore, Spain, Wales, France, Czech Republic and Portugal) allow opting out of the system. Elsewhere, consent from family members or next-of-kin may be required for organ donation.<sup>10</sup> This study is a survey amongst Registered Medical practitioners (RMPs) who tend to be more involved with these issues. This is to determine their level of

knowledge, beliefs and attitudes regarding brain death, use of ventilator and related issues. Well known ethical questions include determining the point where organ removal for donation can take place, when medical care should be withdrawn (or a person kept alive who appears unable to ever recover from coma), and when a person should be considered "dead" in the eyes of the law.<sup>1</sup> This survey is going to conduct in RMPs in Vadodara city of Gujarat state. Because it is well known that registered medical practitioners are in continuous touch with the community on a daily basis, hence it is imperative that we check whether they have sound knowledge regarding brain death and organ donation and transplantation as they can aware large masses of community and gap of organ availability to patient in need can be reduced.

## **REVIEW OF LITERATURE**

### **1. Review of literature related to concepts, knowledge and attitude towards brain death among health care professionals**

A study was conducted in Sindh Pakistan in July 2008 on Brain Death: Concepts and knowledge amongst Health professionals in Province of Sindh, Pakistan. The study included a total of 259 questionnaire that encompassed physicians at different level of training and students in the final year of their training. The study revealed that One hundred and forty one (54 percent) respondents did not have a clear idea regarding the definition of brain death. Majority of doctors 122 (47 percent) would therefore not turn off the ventilator even in a brain dead patient. Most considered 24 hrs as optimal period before confirming the diagnosis of brain death. Most of the doctors favored a confirmatory test, like an electroencephalogram, to confirm the diagnosis of brain death. Majority of the doctors (68 percent) would not consider stopping ventilator support of a patient in a persistent vegetative state. My study also includes concepts and knowledge regarding brain death among registered medical practitioners. This study highlights the lack of understanding and confusion regarding issues surrounding

brain death in this region especially among junior doctors.<sup>11</sup>

## **2. Review of literature related to concepts, knowledge and attitude towards organ donation among health care professionals**

A study was conducted in India in 2013 on the title 'Attitude and knowledge of healthcare workers in critical areas towards deceased organ donation in a public sector hospital in India'. It is a questionnaire based study which included all doctors, paramedical workers, nursing staff and other staff members working in six distinct intensive or emergency care units in the hospital. The questionnaire completion rate was 99%. About 55% of the study populations were agreeable to donating organs after death and 27% were undecided. A largely favorable attitude towards organ donation was seen in our study population. However, the study reflects incomplete knowledge leading to confusion and thus, desire to know more among participants with respect to various aspects regarding organ donation. My study also includes concepts and knowledge regarding organ donation and transplantation among registered medical practitioners, thus awareness is still necessary.<sup>12</sup>

## **3. Review of literature related to concepts, knowledge and attitude towards brain death and organ donation among health care professionals**

A study was done with a objective to assess the knowledge, attitudes of medical students regarding brain death and organ donation from brain dead in 2014. The study was conducted among the final year medical students of JIPMER, Puducherry using a 22-item questionnaire during the academic year 2013. 25% of students believed brain death is equal to human death. 91% students responded that there is no treatment for brain dead patients. 62% of students accepted the concept of brain death. Religious and social reasons were the commonest reason for non-acceptance of brain death among the students. 97% of students believe that organ donation can save a life. 93% of students think that there is difference between organ transplantation

from brain dead and cadaver. In students' opinion, mutilation of the body was found to be the main reason for not accepting organ removal from brain dead patients. My study also includes concepts and knowledge regarding brain death and its usefulness in organ donation and transplantation among RMPs of Vadodara city of Gujarat. This study is very much helpful in knowing the factors influencing diagnosis of brain death and awareness for organ donation.<sup>13</sup>

## **METHODOLOGY**

**Study type-** Prospective concept and knowledge based education intervention study.

**Study population-** Registered Medical practitioners of Vadodara city.

**Data collection-** Prior to start the study, we had taken ethical approval of our institute.

- At study site, RMPs were briefed about the purpose of the research and were invited to participate in the study. The participants were informed through informed consent form that their participation in the study was anonymous, voluntary and not compulsory.
- Assurance was given about anonymity and confidentiality of the information to be provided. Informed consent was taken from all participants in the questionnaire.
- For the purpose of the study, a Knowledge and practice based questionnaire was used. Questionnaire consisted of 20 questions. The correct/positive response was given a score of '1' and the wrong/negative responses '0'. Maximum possible score is 20. Upon discussion with the faculty of the Department of Forensic Medicine we decided that a score of 10 or more out of 20 will be counted as aware or having correct knowledge and concept regarding brain death and organ donation.
- We circulated questionnaires to all participants simultaneously. Any clarification needed in understanding the questionnaire was provided. The questionnaires were pre-tested and pre-

validated by Forensic Medicine department of the hospital. And it was also rearranged for easy convenience of our study.

- An interactive educational intervention was designed separately for all participants participated in questionnaire survey and in order to facilitate the spread of knowledge of brain death and its usefulness in organ transplantation and donation, its ethics and IPC sections involved.
- After end of training session, we again circulated post-test questionnaire consisting same questions to those who participated in educational intervention.
- At the end of study, we measured changes in the knowledge and practices of concept and issues related to Brain Death and its usefulness in organ donation and transplantation among RMPs.

**Data analysis:** The filled questionnaires was analyzed using descriptive statistics by the Microsoft excel spread sheet.

**AIMS AND OBJECTIVES**

1. To assess concept regarding brain death of registered medical practitioners.
2. To assess knowledge of legal and ethical aspects related to brain death among registered medical practitioners.
3. To assess awareness about organ transplantation among registered medical practitioners.
4. To spread awareness about organ transplantation and in benefits among community through RMPs.

**OBSERVATION AND RESULTS**

**Table1: Distribution of study participants according to their field of practice**

Field of practice	Number Of Participants	Percent (%)
Allopathy	52	52.52
Homeopathy	21	21.21
Ayurveda	26	26.26
Total	99	100

**Table2: Number of male and female participated from all the three fields of practice**

	Number Of Participants	Percent (%)
Male	76	76.76
Female	23	23.23
Total	99	100

The study dealt with 99 doctors which included 52 Allopathy doctors (52.52%), 21 Homeopathic doctors (21.21%) and 26 Ayurvedic doctors (26.26%)[TABLE 1]. A number of 23 females (23.23%) participated from all the three field of practice [TABLE 2]. All belonged to different areas of Vadodara and have more than 5 years of experience in their field of practice. An overwhelming majority of the respondents were aware of brain death and its usefulness in organ donation and transplantation in India. Most of them agreed that concept of organ donation is justified and considered that organ donation is good for society.

**Table3: Correct Knowledge and Awareness among study participants about brain death and organ donation before and after educational intervention.**

Field Of Practice	Total Number Of Participants	Number Of Participants Scoring >10 Points Out Of 20 Points	
		Before Education Intervention	After Education Intervention
Allopathy	52	35	47
Homeopathy	21	14	19
Ayurveda	26	15	24
Overall	99	64	90

We have put data for level of awareness in TABLE 3 which shows the level of awareness and correct knowledge amongst registered medical practitioners regarding brain death and organ donation before educational intervention was 64.64%. Distributing 64.64% into three different categories we found that 35 (67.30%) allopathic doctors were already aware while 14 (66.66%) and 15 (57.69%) doctors of homeopathic and ayurveda respectively were already aware of concept and knowledge of brain death and its usefulness in organ donation and transplantation. Though a good majority of doctors were already aware but 17.17% doctors didn't know the criteria for the diagnosis of brain death and would declare brain death even if patient breathes in apnoea test after 2 minutes. 27.27% doctors didn't know the about the human organ transplantatation act-1994. 23.23% of doctors didn't know about the concept of Grafts (allograft, autograft, isograft and xenograft.) 82.82% doctors believed that

the doctor diagnosing the brain death cannot carry out the organ donation and transplantation procedure. 93.93% doctors believed that a state level registry should be maintained and organ retrieval centre should be set up for early removal of organs. The level of awareness amongst registered medical practitioners regarding brain death and organ donation and transplantation after educational intervention [TABLE 3] increased to

90.90% i.e. 26 more doctors scored more than 10 points. Distributing 90.90% into three different categories we found that 47 (90.38%) allopathic doctors became aware while 19 (90.47%) and 24 (92.30%) of homeopathic and ayurvedic practitioners respectively became aware of concept and knowledge of brain death and its usefulness in organ donation and transplantation.

**Table4: Correct Knowledge And Awareness Among Study Participants About Brain Death And Organ Donation After Educational Intervention**

Field of practice	Total number of participants(N)	Obtained mean score out of 20		Statistical value (P value and T Value)
		Before Education Intervention	After Education Intervention	
Allopathy	52	10.17±2.50	13.73±2.67	P value<0.0001, t value = 19.016
Homeopathy	21	10.86±2.24	13.57±2.62	P value<0.0001, t value = 11.783
Ayurveda	26	9.96±1.95	13.50±2.23	P value<0.0001, t value = 9.816
Overall	99	10.26±2.31	13.63±2.52	P value<0.0001, t value = 22.86

Table 4 reveals that mean score of participants before giving educational intervention of allopathy, homeopathy and ayurveda is 10.17±2.50, 10.86±2.24 and 9.96±1.95 respectively which increased to 13.73±2.67, 13.57±2.62 and 13.50±2.23 respectively. Even the overall score of all 99 subjects also increased to 13.63±2.52 from 10.26±2.31. The data is statistically significant (p value<0.0001).

**DISCUSSION**

The term "brain death" was introduced by Ad Hoc Committee of Harvard Medical School more than 45 years ago.<sup>14</sup> This term allowed patients who were considered alive to move into category of 'dead'. Life support could then be removed from these patients. But since the inception of this term, various studies have shown that lay persons and, more importantly, health professionals are confused and do not accept this term.<sup>15,16</sup> No systemized studies have been done to evaluate the opinion and attitudes of health professionals regarding brain death and its usefulness in organ donation and transplantation. With advances in technology and life support systems now increasingly available, this issue has to be addressed. In our study, we found that before educational intervention homeopathy and ayurvedic doctors (66.66% and 57.69% respectively) had less correct knowledge and awareness than allopathy doctors (67.30%), regarding

brain death and its usefulness in organ donation and transplantation, though difference in knowledge between allopathy and homeopathy doctors was relatively very less. While only few ayurvedic doctors were aware about correct knowledge, newer updates were lacking among them. Level of correct knowledge and awareness increased significantly in all the doctors after educational intervention especially among homeopathic and ayurvedic doctors than allopathy doctors as more number of doctors became aware. This difference might be because we included more number of allopathy doctors (n=52) than homeopathy and ayurveda which has affected the ratio. Educational intervention on brain death and organ donation increased the knowledge and awareness of overall participants by 26.26%. Studies from this region, including India and South Korea, have found similar problems with lack of knowledge and awareness in these countries.<sup>17, 18</sup> There is, however, exceptions to the understanding of these issues in select populations where education has made a difference.<sup>19</sup> In our study 93.93% doctors believed that a state level registry should be maintained and organ retrieval centre should be set up for early removal of organs. As lack of a centralized registry for organ donation acts as another major hurdle for the people to donate organs or

get data about donors.<sup>20</sup> The provisions should be made which includes retrieval centre. A mandatory inquiry by the registered medical practitioner of a hospital in consultation with transplant coordinator (if available) from the near relative(s) of potential donor admitted in Intensive Care Unit and informing them about the option to donate and if they consent to donate, inform the retrieval centre for retrieval of organs. In India, the potential for deceased donation is huge due to the high number of fatal road traffic accidents and this pool is yet to be tapped. At any given time, every major city would have 8 – 10 brain deaths in various ICUs. Some 4 – 6% of all hospital deaths are due to brain death. In India, road accidents account for around 1.4 lakh deaths annually. Out of these, almost 65% sustain severe head injuries as per a study carried out by AIIMS, Delhi. This means there are almost 90,000 patients who may be brain dead.<sup>20</sup> It is not that people don't want to donate, but that there are no mechanisms in hospitals to identify and certify brain deaths. Plus, no one empowers the relatives of a brain-dead person to save lives by donating his organs. Anyone from a child to an elderly person can be a donor. Organ donation from the brain dead – also referred to a cadaveric donation is still very low in India. While Spain has 35 organ donors per million people, Britain has 27 donors, US 26 and Australia 11, India's count stands at a mere 0.16 per million people.<sup>20</sup> Thus the only way to empower the relatives of brain dead patients is doctors. Awaiting community is not enough to increase donors and to decrease gap between organ donors and recipients so an approach should be made to aware doctors more and more, who are in continuous touch with large masses of community, so that when people come to their notice they can direct them to right path of donation.

### **CONCLUSION**

Organ Donation plays vital role in saving life of patients with organ failure. In our study; we conclude that there is significant increased knowledge of awareness about brain death and its usefulness in organ

donation and transplantation after giving educational intervention to registered medical practitioners of Vadodara city. That means education to the health care professional lead to not only improvement but also update their knowledge regarding brain death and organ donation.

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