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Original Research Article

AWARENESS OF BRAIN DEATH DOCUMENTATION AMONG POST GRADUATE TRAINEES IN LAHORE

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Abstract: *Brain death is the complete and irreversible cessation of all activity in the brain, including the brain stem and cortex. It's critical to declare someone brain dead to stop providing life support or donating their organs. This study was carried out to evaluate postgraduate trainee doctors' knowledge and understanding of brain death in the Lahore city as the Punjab Human Organ Transplant Authority (PHOTA) moves towards cadaveric donor program. Utilizing the universal sample approach, a questionnaire-based survey with 150 senior trainee registrars from several postgraduate fields was conducted at four teaching hospitals in Lahore. The registrars had 45 minutes to finish a pre-validated questionnaire form that inquired about their perspectives, knowledge, and the procedure for determining brain death. Quantitative data were shown as means, whereas qualitative data was shown as frequencies. SPSS software version 21 was used for statistical analysis. The questionnaire was given to 150 postgraduate trainees in total and result showedthat the 70% were men and 30% were women. Approximately 88.90% of participants were able to define brain death as the total cessation of all brain functioning, including brainstem reflexes. 121 (82%) doctors said yes when asked if they would perform brainstem reflexes twice, six hours apart. Only 40(26.66%) doctors were able to reliably identify the absence of brain stem responses, such as the corneal and pupillary reflexes. Just 10 (6.66%) out of 150 participants were able to correctly define what a positive apnea test means, but 33.33% of respondents agreed that it is a necessary test to demonstrate the cessation of brain stem activity. 15.50% of resident doctors had knowledge that a committee of four doctors was required to declare brain death The gold standard test for determining brain death, according to 4.66% of responders, is cerebral angiography. 95% of respondents were ignorant of the measures being taken by the Punjab Human Organ Authority (PHOTA) concerning the dead organ harvesting program or that such a program even existed. Although everyone agreed that getting an agreement before organ harvesting was required but only five trainees understood the exact methodology of taking consent and how it functioned. It can be concluded from the study that the PGRs lacked knowledge about brain death, its detection and documentation, concerning cadaveric donor organ donation and transplantation and showed a lot of work needed to start cadaveric organ transplant safely.*

Keywords: Brain death, Diagnostic recommendation, Organ transplant, Postgraduate Knowledge

Introduction

The Harvard Medical School Ad Hoc Committee created the term "brain death" to aid with organ donation. It is described as the total and irreversible loss of all brain functions, including brain stem functions(Manara et al., 2019). The World Medical Assembly approved the same definition as a global standard for the definition of brain death/death using neurological criteria (abbreviated as BD/DNC). The 1995 American Academy of Neurology (AAN) standards have been replaced by the 2010 American

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Academy of Neurology (AAN) recommendations for diagnosing brain death (Kapinos and Ala, 2021). The Uniform Determination of Death Act (UDDA) defines death as the irreversible loss of entire brain. This including the brainstem and brainstem reflexes which clinical represent as the complete loss of consciousness (known as coma), and the independent capacity for the ventilatory drive (apnea) (Russell et al., 2019).

It is important to keep in mind that retained neuroendocrine function is not incompatible with the whole brain criterion of death even if there has been irreparable damage to the cerebral hemispheres and brainstem. The World Health Organization (WHO) and a global conference established brain death as the recognized reason of death in 2012 (Nair-Collins and Joffe, 2021).The most frequent causes of brain death include drowning, intracerebral and subarachnoid hemorrhage, post-CPR anoxic brain damage, and traumatic brain injury. The ICU is the typical hospital setting where brain death is observed. Declaring someone brain dead has moral and legal repercussions, thus great care should be taken. Coma, major brain injuries, vegetative state, and minimally responsive condition must be separated from brain death (Shemie et al., 2014).Many brain-dead patients are inappropriately put on mechanical ventilators and given life-sustaining medications because brain death is still not widely recognized in our society. This not only places a financial burden on the patient's relatives but also makes it impossible for the deceased's organs to be donated.The "dead donor rule," which states that organ donation may only take place after death, is still a major topic of discussion in both the medical and non-medical worlds (Shemie and Gardiner, 2018).

This study was carried out to assess the knowledge and awareness about brain death, its diagnosis, documentation, and declaration among the postgraduate residents (PGRs).

Materials and methods

This study involved PGRs from different teaching hospitals in Lahore. Our data collecting team met with PGRs from different subspecialties (completed two years and above) and asked them to complete the questionnaire following the standard data collection methodology. PGRs in their first two years were excluded due to their little familiarity with the subject of the review. We keep distributing the questionnaire till the completion of a total of one hundred and fifty response sheets. Internal medicine, Paediatrics, Intensive Care, Anaesthesia, Orthopaedics, Neurosurgery, General Surgery, and Emergency Medicine were the main specialties consulted. These specialties were included considering their direct exposure and involvement in the management of trauma, head injuries, and intracerebral hemorrhage (Figure 1).

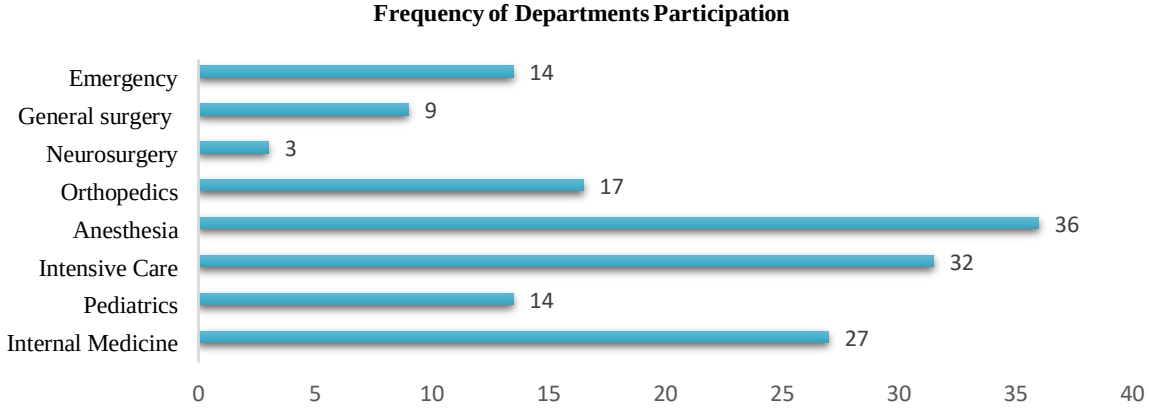

Figure 1: Departments of participants

Some of these specialties are also involved in the declaration of brain death and organ harvesting. Only those doctors who consented to answer the questionnaire were included and provided a pre-validated questionnaire.A questionnaire consisting of knowledge, assessment method, declaration of brain death and its documentation was prepared and distributed among the participating doctors. A formal introduction and description of the study were given to them before the distribution of forms. A time limit of 45 minutes was allowed for each participant. The quantitative data were presented as mean and data percentages and frequencies.

Results

210 doctors were approached, and 150 among them consented to take part in the study. 70% were male and 30% were female doctors (Table 1).

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Table 1 Demographic variables

Variables	Constructs	N (%)
Sex	*Male*	105 (70%)
	female	45 (30%)
Years of Residency	*2-3 years*	58 (38.65%)
	3and above years	29 (19.26 %)
	Postgraduate	63 (42.09%)

The majority of the doctors were aware of brain death, 88.90% were able to correctly define brain death as the complete and irreversible cessation of all brain activities including that of the brain stem (Figure 2). 72% were able to describe brain death and the vegetative state as different entities.

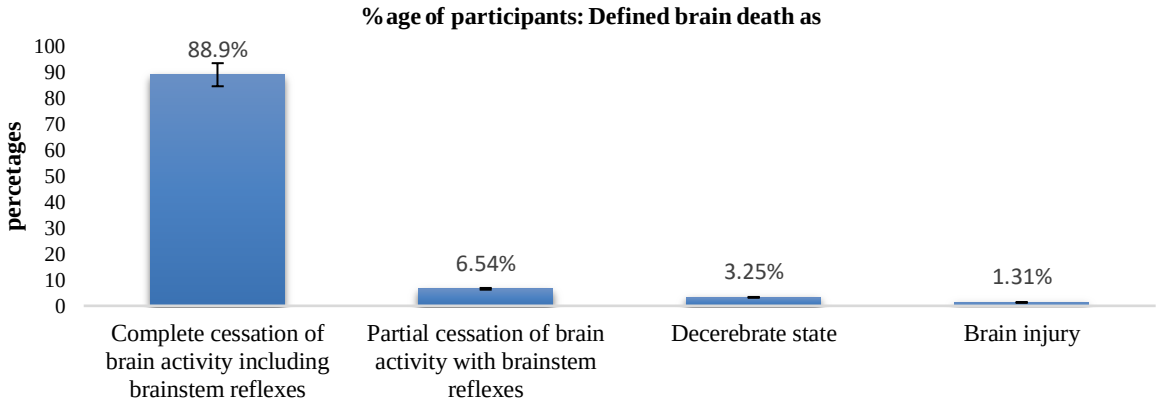

Figure 2: Answers of participants regarding Brain death

121 (82%) doctors said yes when asked if they would perform brainstem reflexes twice, six hours apart. Only 15 (10%) doctors were able to distinguish the oculovestibular reflex and the lack of grimacing in reaction to painful stimuli, while only 40(26.66%) doctors were able to reliably identify the absence of brain stem responses, such as the corneal and pupillary reflexes.Only 10(6.66%) trainees were able to confirm what a positive apnea test meant, despite the fact that 50 (33.33%) trainees agreed that it is a required test to record the termination of brain stem activities. [Figure 3]. The electroencephalogram (EEG), which shows electro-cerebral silence and signifies the termination of cortical activities, should be performed as a confirmatory test for cortical function, according to 50 (33.33%)trainees. Cerebral angiography was only recognized as the gold standard technique to establish brain death by 7(4.66%). trainees All tests should be conducted before brain death confirmation, according to 75 (50%) respondents.89.50% of resident doctors believed that media awareness-raising was required to motivate families to donate organs. 3.33% were aware of the Organ Donation Act. 100% of respondents agreed that obtaining consent is necessary before harvesting organs, yet only 5 (3.33%) were aware of the concept and its application. 95% of respondents were ignorant of the measures being taken by the Punjab Human Organ Authority (PHOTA) concerning the dead organ harvesting program or that such a program even existed.

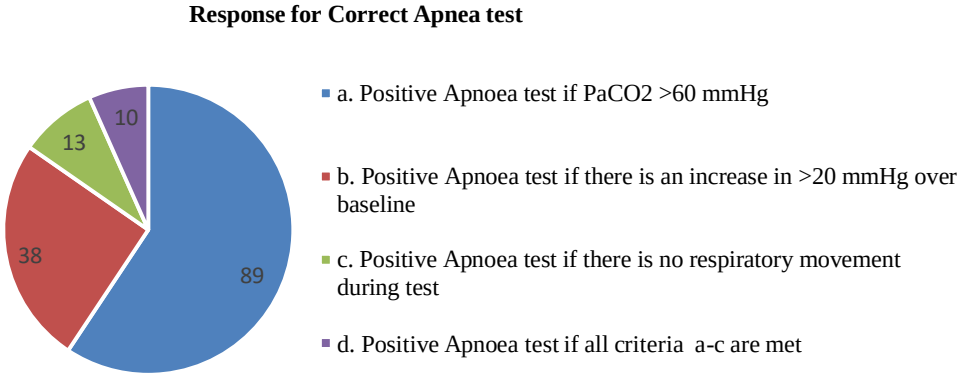

Figure 3: Answers regarding correct apnea test

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Discussion

The majority of medical practitioners worldwide are familiar with the term "brain death." (Bernat and Dalle Ave, 2019). After a brain death diagnosis, the neurological function has never been seen to recover (Wijdicks, 2012). Declaring brain death and obtaining cadaveric organs for transplantation on the table is still in infancy stage in Pakistan and mostly doctors preferredlive donor transplant. There are several reasons for this, including lack of knowledge, strong religious beliefs, socioeconomic challenges, various ethical dilemmas, a lack of motivation, and a significant gap between public and private hospitals(Balwani et al., 2015; Vincent and Logan, 2012). Professional opinions against organ donation from brain-dead donors are a significant barrier. to explain the brain death to the distressed family members is usually a difficult task for the doctors. It is very difficult for a doctor to explain brain death to distressed family members(Zimmermann et al., 2019). To help patients' relatives and medical personnel to communicate under these circumstances, on-site counsellors must possess outstanding interpersonal communication skillsand the Intensive Care Unit and hospital staff must collaborate well to maintain organ function following brain death.

A process involving the determination of evidence that accurately explains the etiology of brain dysfunction is necessary to determine brain death(Youn and Greer, 2014).Furthermore, conditions that might misguide the clinical determination of brain death must be ruled out. Six hours apart, two comprehensive neurological examinations showing brain stem death along with the apnea tests are performed to declare the brain death. The second apnea test is the time of death when $PaCO_2$ reaches the preferred value(Nakagawa et al., 2012). The safety of apnea test protocols and the minimum permitted interval between two clinical exams cannot be decided based on the facts at hand. Ancillary testing can be utilized if the results of the neurologic examination are in question. However, the physician must evaluate the use of auxiliary tests to show brain death (Varelas et al., 2021).The reliability of more recent auxiliary tests and the lack of data required to determine the minimum permitted observation period make it difficult to make an early diagnosis of brain death (Greer et al., 2020).The majority of resident physicians lacked knowledge of medical law, including how to register for organ donation, how many physicians were required to confirm brain death, and conflicts over presumed vs informed permission. Only 15.50% of resident doctors were aware that a group of four doctors was needed to declare brain death. and the member of the panel shouldn't be a part of the transplant team.

Most of countries have standards for detecting brain death, according to an essay written by Wijdicks on global brain death criteria. Research-based literature on techniques for detecting brain death are limited (Su et al., 2022).Despite the fact that there are international standards and recommendations for the brain death diagnosis, still conceptual discrepancies exist (Burkle et al., 2014; Citerio et al., 2014). 89.50% of resident physicians said that media outreach was necessary to encourage patients and family members to donate organs. Relatives are reluctant to provide because they were not told of the deceased's prior preferences regarding organ donation. The continual rise in the number of families willing to donate organs has been directly credited to the Spanish model of organ donation and transplantation, which trains medical professionals(Sulania et al., 2016). How effectively a potential organ donor is cared for, may depend on the quality of teaching provided on identifying and reporting brain death(Martin-Loeches et al., 2019).A comprehensive training program created to open discussions on declaring brain death and preparing for the organ donation can significantly enhance the understanding and attitude of professionals. They can influence the proportion of families that refuse to give organs and save potential donors from being lost (Randhawa and Schicktanz, 2013).A comprehensive plan and skilled transplant coordinators can make it easier to handle brain-dead donors properly. Enforcing mandatory reporting of brain-dead incidents to relevant authorities will advance this effort (De Groot et al., 2015). Even though this survey was done at four busy hospitals of Lahore, it only captures the local concept of brain death of the city Lahore. A multi-city investigation must be carried out to obtain more specific information.

Conclusion

The PGRs lacked knowledge about brain death, its detection and documentation, concerning cadaveric donor organ donation and transplantation. The results of this study showed a lot of work needed to make grounds in order to start cadaveric organ transplant safely. The first step to attain this goal is regular classes and workshops. In this way we can raise awareness to implement and successfully run the cadaveric organ donation program.

Conflict of Interest

The authors declared no conflict of interest.

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