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Review

Determination of death: Metaphysical and biomedical discourse

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ABSTRACT

The prominence of biomedical criteria relying on brain death reduces the impact of metaphysical, anthropological, psychosocial, cultural, religious, and legal aspects disclosing the real value and essence of human life. The aim of this literature review is to discuss metaphysical and biomedical approaches toward death and their complimentary relationship in the determination of death. A critical appraisal of theoretical and scientific evidence and legal documents supported analytical discourse. In the *metaphysical* discourse of death, two main questions about what human death is and how to determine the fact of death clearly separate the ontological and epistemological aspects of death. During the 20th century, various understandings of human death distinguished two different approaches toward the human: the human is a subject of activities or a subject of the human being. Extinction of the difference between the entities and the being, emphasized as rational–logical instrumentation, is not sufficient to understand death thoroughly. *Biological criteria* of death are associated with biological features and irreversible loss of certain cognitive capabilities. Debating on the question "Does a brain death mean death of a human being?" two approaches are considering: the body-centrist and the mind-centrist. By bridging those two alternatives human death appears not only as biomedical, but also as metaphysical phenomenon. It was summarized that a predominance of clinical criteria for determination of death in practice leads to medicalization of death and limits the holistic perspective toward individual's death. Therefore, the balance of metaphysical and biomedical

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approaches toward death and its determination would decrease the medicalization of the concept of death.

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1. Introduction

The boundary between life and death continues to be the object of debate despite the fact that ''humanity has thoughtfully struggled with the concept and criteria for death for millennia'' [1]. The importance and the need to reconsider criteria for the definition of human death and to develop more rigorous ones have increased with advanced medical technologies in resuscitation and life maintenance systems and with the growing demand for organ transplantation. In natural sciences, there is no problem of death: everything what is alive dies. Human death is not the only event in the body, but as an event that occurs in the human being, it is an individual human drama. Thus, the prominence of brain death criteria regarding the interpretation of death and dying reduces the impact of anthropological, psychosocial, cultural, religious, and legal aspects. With its manifestation, the real value and essence of human life is disclosed. The end is an empirical outcome, but the essence lies in the meta-empirical reason.

Following Brugger, ''if the brain entirely and irreversibly ceases to function, the organism and, hence, the human being, ceases to be.'' By such a biomedical definition of death, ''organism death is equated with the death of the being'' [2]. The controversy of clinical criteria of death is still being widely debated in scientific literature [3,4]. Some researchers believe that brain death criteria are only a legal construct without any reference to the metaphysical and even actual biological basis for the determination of death [5,6].

One of the core issues has been the implementation of criteria of death into the legislation system regulating organ transplantation and other clinical practices like do-not-resuscitation tactics in intensive care units.

From the historical perspective, neurological criteria of death – better known as *brain death* – have been defined by the Ad Hoc Committee of the Harvard Medical School in 1968 [7]. The Harvard criteria still ''remain an example of simplicity'' [8] as they are as follows: unreceptivity and unresponsiveness; no movement or breathing; no reflexes; flat electroencephalogram; repetition of all tests at least 24 h later with no change and exclusion of hypothermia or central nervous system depressants [7].

Meanwhile the neurological criteria for the determination of death were theoretically justified [2] by President's Commission that in 1981 published the landmark report ''Defining Death: Medical, Legal and Ethical Issues in the Determination of Death'' [9]. In this report, the brain is approached as the regulator of the body's complex integration: respiration and heartbeat are controlled by brain centers. Accordingly, as it was defined by President's Commission, death is the moment at which the body loses its complex integration, i.e., ''at which the body's physiological system ceases to constitute an integrated whole'' [9]. It is clear, that exposure of Harvard criteria of death and prevalence of organ transplantation launched further discussion on the ethical and practical questions of how to protect patients from irresponsible decisions and avoid medical errors in diagnosis.

Montreal Forum Report for its purpose considered death as a biological event and respectfully recognized the impact of attending religious, ethical, legal, spiritual, philosophical and cultural aspects of death and its determination following the guidelines proposed [1,3]. In any case, when the analysis of the conception of death takes place, one of the fundamental questions – whether patients with the diagnosis of complete brain death are really dead – remains open.

The aim of this review is to discuss metaphysical and biomedical approaches toward death and their complimentary relationship in the determination of death.

2. Metaphysical approach toward death

There are two main issues related to the philosophical analysis of death: (1) what the death is? and (2) how to determine the fact of death? These questions clearly separate the ontological and epistemological aspects of death and build a conceptual framework to reveal the problem of death criteria. From the ontological point of view, the conceptual definition of death is important. Among the abundance of definitions, one says that ''death is the irreversible extinction of the body's vital functions'' or, for example, ''human death is the irreversible loss of one's personhood'' [10]. From the epistemological point of view, in order to conclude the fact of death, certain criteria to find out how it happened, as well as specific clinical measures to assess how these criteria are met, are necessary. Cardiopulmonary and total brain death criteria traditionally remain considered as the main criteria of such knowledge. The definition of an individual's death is inevitably linked with further questions: how the human death is associated with the concept of death of other living creatures; whether human death is only the act of biological nature, i.e., just the death of a physical body, or the concepts of life and death should be linked with the soul matters; or maybe the individual is ontologically neutral, something between life and death; what is the connection between death and the person's identity?

In the 20th century, the approach to human death was mostly formed by existential philosophy. Heidegger primarily distinguishes death as the exceptional opportunity of human existence. Heidegger emphasizes the difference between death as an actual event and death as personal comprehension. In particular, he states, ''The publicness of everyday being-with-one-another 'knows' death as a constantly occurring event, as a 'case of death.' Someone or another 'dies,' be a neighbor or a stranger. People unknown to us 'die' daily and hourly'' [11]. Accordingly, Heidegger

concludes that people have already secured an interpretation for death as an event: ''One also dies at the end, but for now one is not involved'' [11].

Derrida deconstructs the existential concept of death. Derrida underlines death as the only situation of human existence (or non-existence) in which individuals find themselves when their subjectivity and individuality reaches maximum. This is the situation when a particular individual is irreplaceable, when he or she completely identifies with himself or herself in the sense that he or she cannot transfer this or her death to someone else: ''Death is very much that which nobody else can undergo or confront in my place. My irreplaceability is therefore conferred, delivered, 'given,' one can say, by death'' [12]. Death provides the human being with the opportunity which he does not have and will not have in his whole life. In this context, Derrida's insights regarding his perception of death are very important, and the expression *my death* is identified. What is meant by *my death*? By Derrida, the expression of *my death* is ''an illusory of the possible meaning of such expression. This does not even embody a particular meaning, and even not has a referent'' [13].

In order to understand or at least to think about the possible meaning of *my death*, Derrida constructs the concept of *difference*. Through this concept, a human is able to understand this non-existence in space and time as his/her own and not another one. Then perception of death completes self-cognition and discloses an antinomian nature of death.

Foucault's approach reflects the transformation of the concept of death, prevailing in the classical medical thinking, which indicates the comprehensible transition from death as a limit or threat to death as interpretation of a source of knowledge [14]. Western European classical epistemology standard means knowledge through concepts that provide a rational understanding of reality, which can be adequately absorbed by mind (the identity of being and thinking). After all, death is nothingness; thus, the question is what kind of concepts can provide an adequate understanding of its effects, because the insufficiency of logical-cognitive instrumentation is obvious. The scientific literature refers to the change of epistemological tactics: from ''thinking and the identity of existence'' to ''thinking and the identity of non-existence.'' This means that if the phenomenon of death cannot be recognized in the paradigm of thinking and the identity of existence, the question of attaining death by mind should not be emphasized. On the contrary, the question of the limits of mind should be highlighted. In this sense, *homo philosophicus* and *homo religious* is a tandem, which is ''forced'' [15]. What does that mean? It is crucial for the being to become a general concept, because in this way it [*being*] is pushed into the transcendence, which ultimately leads to its becoming the entity, and alongside the disappearance of the difference between the entities and the being in general [16]. Only by knowing the entities, we learn something about the being – the presence of the entities allows us to know about the being in general. Being able to see the world in being is to see the non-random nature of the world, to envisage its eternal essence beyond the chaos of outer temporal phenomena. In other words, death can be defined as ''the super-empirical transcription of the essence of God into the empirical reality'' [15]. Consequently, only the rational-logical instrumentation is not sufficient to know death exhaustively; it requires a transcendent religious dimension. However, specific standards (measurable and observable biomedical criteria) are needed in practical medicine, particularly in decision-making related to emergency care, organ donation, etc.

3. Biomedical approach toward human death and its determination

Generally, death is described as ''the end of life'' [17]. Death could be applicable to any living being as it is ''a process based on cessation of function and determination of death is an event (a moment in time) in that process.'' Two major approaches have been dominant in scientific literature during the last few decades: (1) ''irreversible loss of functioning of an organism as a whole (not the whole organism), often cited as whole brain definitions and (2) irreversible loss of the capacity for consciousness, often cited as higher brain definition'' [1].

To interpret the term *death* in a particular context, it should be operationalized and explained how to recognize, describe and evaluate it. Shewmon DA and Shewmon ES listed moments that have been proposed across the history of medicine – seven biological criteria to recognize death: the last exhalation, the last systole, no possibility of recovery or lack of availability of spontaneous recovery, the complete and irreversible loss of consciousness, and irreversible loss of all brain functions [18], i.e., irreversible coma [7]. However, criteria of death are associated not merely with a loss of biological capabilities, but also with a loss of certain cognitive capabilities (the cognitive criteria) including such mental properties as memory, moral agency or self-consciousness. To develop the understanding of criteria of death, the term *irreversibility standard* has been elaborated to ''define death as occurring when the capacity for consciousness is forever lost'' [19].

According to Wijdicks, the addition of neurological criteria of death (brain death) to cardiorespiratory criteria of death was 'a paradigm shift which evolved when patients with acute brain injury could be resuscitated' in medical facilities [8]. From the perspective of physicians, it is important to focus on the pragmatic definition of human death, which was integrated in neurological and circulatory dying sequences, presented in the Montreal Forum Report in 2012. Participants of this Forum agreed on an *operational definition of human death*. This is a workable definition that describes the state of human death based on observable and measurable aspects (scientific, biological, medical) of dying and the determination of death [1]. This definition provides the background for the legal determination of death.

Natori claims that ''from a medical standpoint the legal determination of brain death has a limited range of discretion,'' and therefore ''a significant difference occurs between the diagnosis of brain death, as a clinical stage diagnosis, and the legal determination of brain death'' for the purpose of organ donation [20]. The EU directive ''On Standards of Quality and Safety of Human Organs'' addresses the issue of brain death to be determined at the national level [21]. In particular, it constitutes: ''Other internationally recognized principles guiding practices in organ donation and transplantation

include, inter alia, the certification or the confirmation of death in accordance with national provisions before the procurement of organs from deceased persons and the allocation of organs based on transparent, non-discriminatory and scientific criteria.'' This position matches the statement of Wijdicks about remaining ''great variability in how brain death criteria were codified in different parts of the world.'' For this reason, physicians from different countries and likely in different hospitals within each country have come to ''their own judgment in how to solidify the criteria'' of brain death determination and preparation for organ donation [8].

In the context of the Lithuanian legislation system, the determination of death and death criteria are based on the determination of irreversible cessation of blood circulation and breathing presented in ''The Law on the Establishment of Death of a Human Being and on Critical Conditions'' [22]. In particular, the law constitutes that ''irreversible cessation of the circulation and respiration shall be determined in the presence of incontrovertible evidences of death. In the absence of incontrovertible evidences of death irreversible cessation of the circulation and respiration shall be determined by the response of the cardiovascular system to resuscitation actions'' (Article 5). Additionally, the determination of brain death is defined by ''proving with the reasonable tests that function of the whole human brain is irreversibly lost, and the circulation and respiration of a human being continue being supported only by artificial measures'' [22].

Legal aspects of the determination of death also relate to some circumstances when a person can be declared dead by legal acts or court judgment without confirmation from a medical institution, although such a legal condition is not a subject of this paper.

4. Complimentary relationship of metaphysical and biomedical approaches toward death: does the brain death mean death of a human being?

Considering the criteria of death, different levels of death are exposed, namely: death of cells, tissues, an organic body and death of a human being. The human is well recognized as a biopsychosocial-spiritual being; hence, the human might be regarded as an individual, a person or a personality. According to Manninen, the content of the definition of death should include the perception of identity of a person. Consequently, it constitutes the question when the human being starts its existence as a person, and what conditions are needed to materialize the individual's identity. Equally, we could consider when the human being ends its existence or whenever the conditions for existence are to diminish [19]. Considering this, two approaches of the human being as a person are presented. The first one is animalistic, according to which the human being is essentially a human animal (as a representative of the species *homo sapiens*). Consequently, the identity as the individual remains as long as the body continues to function or, in other words, we begin to exist when our body begins to function. We continue to exist as long as our body continues functioning and, what is especially important, the death of the body is defined as ''the break of integral unity of the functioning body'' [19]. The animalistic approach advocates the idea that mental properties are completely unimportant for personal identity, which means that human individuality may expose itself with consciousness or without it [19].

Quite an opposite approach to human death is based on the idea that the identity of a person relates to psychological abilities. It constitutes the human being not merely as a human animal, but rather as an embodied mind, i.e., the human being has to have functional brain, which generates consciousness. It means that we as human beings begin to exist only if the fetal brain cortex becomes matured and when it begins to provide the ability of consciousness, and we do not exist, if we have lost consciousness. This approach defines two types of death: death of the 'self' and death of a physical organism [23]. This approach is well contributed by Shewmon's explanation that all different cells, tissues and organs should be organized and unified so in order to create the being [24]. Hence, the unified principle could not be just a substantial organ. It should be a form or an order which determines all elements to one unified substantial being (including the brain). Following Aristotle, this unifying principle or the form is regarded as a soul, and philosophically the first principle of life was to organize (categorize) the body [25]. Therefore, it leads us to the question: do I as a person use my brain as an instrument for mental functioning (while seeing, feeling, willing, etc.) or rather my brain generates my person? In the first case, I am a subject, as a hybrid of material and non-material substance. In the second case, my brain is a part of a living organism and I ought to be a non-material and material (animal) organism [25].

Concluding these two approaches, Shewmon evaluated two opposite mind experiments as beneficial for realizing the ontological status of complete brain death [5]. He concluded these two opposite approaches to be grounded on the conceptual and empirical understandings of complete brain death and, therefore, suggested to integrate them by using the body-centrist and the mind-centrist definitions. Accordingly, the body-centrist approach emphasized the loss of an organism as an entity, while the mind-centrist – the loss of consciousness and personhood.

The so-called body-centrist approach was mostly initiated by Bernat et al., who constituted the disappearance of a bodily integrative entity; however, they missed that it was derived from the interrelated interactions of body parts [26]. In particular, Gert et al. constituted four criteria of death including the loss of the cortical function, the loss of the brain stem constant function, the loss of the entire brain function and the loss of the heart and lung functions [27]. However, only the third mentioned criterion correlated with the loss of the function of an organism as an entity and the loss of complete consciousness. According to Shewmon, the fifth criterion of death should be sustained cessation of a cessation of an oxygenated blood supply [24]. This criterion corresponds to Pellegrino's statement that any violence of the *do not resuscitate* order means that any medical treatment should be regarded as meaningless and, thus, re-establishing of cardiopulmonary functions has no sense. For this reason, violation of the *do not resuscitate* order means

that death should be allowed to happen as the natural last event [6].

Following Gert et al., the human being should be regarded as a hybrid of a biological and psychological entity. Therefore, if only one (not necessarily both) of these two dimensions were lost, it would not mean that the human being was dead; but rather that the person was incapable physically or mentally. Permanent unconsciousness then would be assumed as an exceptional case of mental incapability [27].

However, this approach has been criticized by Lizza and other scholars. According to them, an essential characteristic of the human personality is the mind and, therefore, it should be excluded from the human organism. The human person is a hybrid of biological and mental entities and if one of those entities was lost then it should be the loss of the human person as well. For instance, Lizza did not agree to accept a patient in the vegetative state as a merely incapable person [28]. This perception was grounded on the statement that a human organism could have biological living even without any brain function and, therefore, should be aligned to higher brain death, as represented by other scholars, too [28,29]. In this respect, Lizza assumed that a human organism could remain as an organic entity without the brain function but could not be equalized to death of the human being [28]. He emphasized the increasing conceptual doubt whether people without any brain functions (corresponding to neurological criteria) or no heart beating donors were dead. For example, Shewmon refused the implementation of neurological criteria and perceived that patients (even if they corresponded to criteria of death) should be regarded as alive and keeping their common human function such as potentiality of intellect and will [30]. In contrary to this, Lizza assumed such patients as dead [28].

How to resolve such conceptual contradictions? Shewmon has suggested the so-called semantic bisection, similar to the traditional comparison between conception and birth of a living being. To rescue from the semantic misconception, death has been defined by the terms of *passing away* and *de-animation*. In this respect, *passing away* has been regarded as permanent loss of an organism as an entity. On other hand, *de-animation* has been defined as irreversible loss of an organism as an entity, meaning the irreversibility implicitly, without any possibility to change it back [2]. This conceptual analysis was applied by Jones while discussing the case when all organs could be taken from a donor only if a donor was really dead. Jones suggested that clinical and metaphysical concepts of death do not contradict and intervene in each other, but rather supplement and create a more holistic approach toward human death [31]. Accordingly, it means that those terms constitute different meanings: *passing away* is sufficient to resolve ethical or legal issues in clinical settings, while *de-animation* exposes the metaphysical reflection of human death [31].

With this review we endorse, that the criteria of death and the controversies related to practical issues remain open. On the other hand, the discrepancy of criteria of death may have a negative impact, such as the promotion of organ donation, may raise unfounded fears of society and may cause more anxiety in patients and families, as well as health care professionals.

5. Concluding remarks

Discussion concerning the metaphysical and practical biomedical questions of death is essential to increasing awareness about death determination. These discussions help to decrease irresponsible or even illegal behavior when making decisions about end-of-life care. This review presents the main conceptual issue which is the status of total ontological brain death. The addition of neurological criteria of breath death to cardiorespiratory criteria of death adds to the discussion about actual moment of death. This question remains unanswered; however, a predominance of clinical criteria for determination of death in practice leads to medicalization of death. A balance of metaphysical and biomedical approaches toward death and its determination would decrease the medicalization of the concept of death.

Authors' contribution

I.J. and Ž.L. developed the conception of the article and together with E.P. drafted the manuscript, providing important intellectual content; Ž.B., O.R. and E.S. revised the content critically for the accuracy and integrity, and complemented the interpretation. I.J., Ž.L., E.P., Ž.B., OR and ES worked together during manuscript improvement and agreed on its final version to be published.

Conflict of interest

The authors state no conflict of interest in preparation of this manuscript.

Ethical approval

Not applicable.

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