

## **On the concept of brain death**

*"... it is recommendable to delve deeper into the biophilosophical aspects of brain death as a concept of death, in order to rebut the criticisms that brain death has in some academic circles..."*

In the November 2014 issue of the American Journal of Bioethics (1), Professor James L. Bernat reflects on where the concept of brain death is headed. The reason for this is the fact that there is still reticence as regards this concept in the public and academic spheres. Professor Bernat refers to two recent cases in which the diagnosis of brain death led to clinical-ethical-care problems that emerged in the media and public opinion. One of these is the case of Jahi McMath, a child who suffered severe anoxic encephalopathy, as a result of which she developed symptoms consistent with a diagnosis of brain death. Jahi's parents refused to accept the diagnosis of death, and requested that the patient's treatment be maintained, as they did not consider her dead. The second case is that of Marlise Muñoz, a pregnant patient, also declared brain death and whose physicians decided to maintain life support measures (connection to a respirator, and maintenance of other treatments), based on the fact that the survival of the foetus was at stake. Marlise's family asked that these support measures be withdrawn, since Marlise was considered clinically and legally dead.

## **Persistence of controversy**

The persistence of controversies in relation to the concept of brain death is striking, although it is over 40 years since the birth of this concept of death of the person, published in the Journal of the American Medical Association (JAMA) in 1968 (2). What though are the factors that can sway these arguments? In his article, Bernat attributes the controversy, among other causes, to the terminology "brain death" itself, which according to him, leads to confusion for at least two reasons: the first is that the term "brain death" implies that the only thing that dies is the brain and not the person; and the second is that the term "brain death" can lead us to think that there is more than one type of death (e.g. heart death, respiratory death, etc).

There are other various reasons that explain the fact that brain death continues to be a subject of discussion. We should not forget that the origin of the concept of brain death was not concerned with establishing a new definition of death; rather, this "new form of death" was aimed at two specific objectives (stated in the article from Harvard Medical School published in JAMA 1968): 1.- To withdraw treatment in patients in intensive care connected to mechanical ventilation but with no hope of survival, and 2.- To facilitate organ donation for transplants. The commotion initially generated at that time by this new concept (death as measured by neurological criteria, in contrast to the cardio-circulatory criteria that had been maintained for millennia) was counterbalanced with the fact that a diagnosis of brain death was undeniably useful in making it possible to procure organs for transplants, and giving life to those patients who would not survive without those transplanted organs. This utilitarian aspect reflected in the JAMA article has always been stressed by those to oppose this concept of death. However, it should not be forgotten either that the JAMA article did not recognise in its title the fact that it was defining a new concept of death; in fact, the Harvard Medical School article

was entitled "A definition of irreversible coma", and only the subtitle made reference to a new definition of death.

## Three simultaneous concepts of brain death

In subsequent years, the controversy grew due to the fact that new concepts of "brain death" arose, different to what had been established by the Harvard school. In order to establish death,

A. this required the *irreversible loss of function in the brain stem* and cerebral hemispheres (Whole Brain Death).

B. However, British neurologists later coined the concept of *death of the person based on the irreversible loss of brain stem function (Brain Stem Death)*, without requiring, therefore, *irreversible cessation of cerebral hemisphere functions*, thus reducing the neurological requisites for establishing death of the person.

C. A third concept of brain death was later described by professor Robert Veatch (3), who proposed that death of the person should be established in situations in which the content of consciousness has been irreversibly lost (a situation similar to that which occurs in patients in a persistent vegetative state), regardless of whether or not there are other brain or brain stem functions.

The existence of *three simultaneous concepts* of brain death was not the largest stumbling block to universal acceptance of this concept. Another major obstacle to its definitive implementation was the fact that some of the leading scientists who had supported the concept of whole brain death at the beginning now withdrew their support for it. The principle exponent is Dr. Alan Shewmon, professor emeritus in neurology at UCLA. Some of these authors, as Bernat reports in his article, have come to classify brain death unscientifically, illogically, even treating it like a legal fiction exclusively designed for cadaveric transplantation. Another major element that made it difficult to consolidate the concept of brain death was the fact that the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research (4) rectified some of the statements included in the 1981 document. This document maintained that death of the person could be established by neurological criteria (brain death), since these criteria meant death of the individual "as a whole", and that death of the individual occurred when there was brain death due to the fact that the brain possessed the "the integrating and coordinating functions" of the rest of the body. Consequently, the "absence of brain activity implied the absence of integration and control of the rest of the body" and therefore, the absence of a critical element for the integration of the organism (namely the brain) meant absence of control of the organism as a whole. In 1999, professor Shewmon (5) refuted this proposal, arguing that many of the integrative body functions that had been attributed to the brain were not executed by it, but outside of it. Thus, in brain dead patients, certain functions could persist, such as homeostasis, recycling of cellular waste, wound healing, response to infection, cell maturation, pregnancy, growth, etc., so Shewmon stated that "brain death cannot be sustained on the biological basis that these individuals have lost the capacity for bodily integration" (6). These arguments were studied by the Presidential Commission (Presidential Commission document 2008) (7), offering new grounds for brain death as death of the individual: "the patient with total brain failure is no longer able to carry out

the fundamental work of a living organism. Such a patient has lost—and lost irreversibly—a fundamental openness to the surrounding environment as well as the capacity and drive to act on this environment on his or her own behalf".

Bernat himself recently stated that brain death is not "founded on the integration", but on the cessation of the organism as a whole, a biophilosophical concept coined in 1916 by the biologist Jacques Loeb. For this, the "organism as a whole" (8) does not refer to the wholeness of the organism (the sum of its parts), but rather to those "higher functions" beyond the sum of its parts: the emerging functions that appear when the organs as a whole work in a coordinated manner. Death of the brain would therefore be death because the organism "as a whole" "has ceased, although obviously many of the parts of the organism remain alive". Bernat admits in his article in the November 2014 American Journal of Bioethics that it is true that, even now, the concept of *the "organism as a whole" continues to be a vague concept*, proposing a biophilosophical foundation for it in accordance with the proposals of Bonelli et al. (9), who formulated four criteria to consider a form of life as a "unified whole organism":

- 1.- "Completion" (finalization, culmination): The organism is not a component part of another living entity, but is in itself a complete and independent whole;
- 2.- Indivisibility: No organism can be divided into more than one living organism, and if such a division occurs and the organism survives, the organism must survive in one of its divided parts;
- 3.- Autofinality or self-reference: The life processes of the parts serve to preserve the whole, even at the cost of survival of the parts, because the survival of the whole living being is the primary purpose; and
- 4.- Identity: Despite the incremental changes of loss or gain of certain component parts, the human being remains as one and only during its entire life.

Bonelli et al. (whose concept is also supported by Bernat) argue that ***brain death is death of the individual because:***

- 1.- The organism has lost its immanence, since its life processes no longer arise from itself but from the external support of the ICU,
- 2.- The organism has lost its autofinality, because the control over its components (organs-subsystems) is now directed towards the survival of the parts and not the whole;
- 3.- The organism has lost self-reference, because the continued functioning of its parts is no longer compatible with the function of the totality; and
- 4.- The organism has lost its integrity and indivisibility, because its different components and sub-systems do not belong to one another and do not constitute a whole.

Bernat ends his opinion piece by making reference to the fact that, although in the academic sphere there are areas of scepticism and criticism of the concept of brain death, these criticisms have not significantly spread to the general public, where there is

an acceptance of the concept of brain death as death of the person. Nevertheless, from Bernat's reflections it can also be inferred that it is recommendable to delve deeper into the biophilosophical aspects of brain death as a concept of death, in order to rebut the criticisms that brain death has in some academic circles.



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