

Original article

Confirmation of brain death diagnosis: A study on French practice



Jean-Christophe Orban^{a,b,*}, Elodie Ferret^a, Patrick Jambou^c, Carole Ichai^{a,b},
for the AzuRéa group

^a Réanimation médico-chirurgicale, Hôpital Saint-Roch, CHU de Nice, rue Pierre-Dévoluy, 06001 Nice cedex 1, France

^b IRCAN, Faculté de Médecine, Université de Nice Sophia-Antipolis, avenue Valombrose, 06107 Nice cedex 2, France

^c Coordination Hospitalière des Prélèvements d'Organes et de Tissus, Hôpital de Cimiez, CHU de Nice, avenue Reine-Victoria, 06001 Nice cedex 1, France

ARTICLE INFO

Article history:

Available online 21 May 2015

Keywords:

Survey
Brain death
Electroencephalogram
Brain CT-angiography
Transcranial Doppler

ABSTRACT

Introduction: In France, brain death diagnosis is regulated by law and mandates the use of confirmatory tests (electroencephalogram or angiography). No data are available on this practice and the possible influence of medical history.

Study design: National survey using an e-mail questionnaire after phone agreement.

Patients and methods: A questionnaire was sent to intensive care units allowed to practice organ harvesting. It assessed the use of supplementary tests, the reasons behind the choice of a confirmatory test, as well as the influence of medical history on decision-making.

Results: Eighty-two out of 188 intensive care units (ICU) answered the questionnaire. Most of them (80%) performed supplementary tests, mainly transcranial Doppler. Computed tomography (CT) angiography was the only confirmatory test available in all ICUs, and this without interruption for 94% of them. Electroencephalogram (EEG) availability was usually restricted to weekdays. Most ICUs confirmed brain death by a CT-angiography (95%), less frequently by EEG (54%) and rarely by arteriography (12%). These tests were usually performed within 1 to 6 hours after clinical diagnosis. Results from imaging tests were obtained within 15 minutes in the majority of ICUs (59%), whereas the time for EEG results was more frequently between 15 and 60 minutes (62%). The choice of confirmatory test was guided by its availability (43%), or protocol driven (20%), or a combination of both of the latter criteria (35%). Medical history had no influence on this choice for 63% of respondents.

Discussion: CT-angiography is currently the privileged confirmatory test for the diagnosis of brain death in France. Availability is the main reason behind this choice. The EEG is the second most commonly used test. Transcranial Doppler helps to determine when to perform confirmatory tests.

© 2015 Société française d'anesthésie et de réanimation (Sfar). Published by Elsevier Masson SAS. All rights reserved.

1. Introduction

Brain death (BD) is defined by a total and irreversible loss of all brain function in a patient with a beating heart [1]. This results from prolonged cerebral circulatory arrest leading to hypoxia, energy failure and eventually cellular necrosis. In 1959, Mollaret and Goulon [2] first described this state as “coma dépassé” or irretrievable coma. A more precise definition of brain death was issued in 1968 in the report of the ad hoc committee of the Harvard

Medical School [3]. The same year, in France, the Jeanneney Circular authorized organ procurement on brain dead patients.

Now, most countries have laws regulating brain death diagnosis and organ procurement. However, criteria and guidelines differ according to country [4]. In Anglo-Saxon countries, brain death diagnosis relies mainly on clinical neurologic examination after exclusion of confounding factors such as hypothermia, sedation or drugs [4,5]. Ancillary tests are not mandatory but can be used in cases of clinical uncertainty, impossibility to perform apnoea or to shorten the duration of the observation period [5]. In other countries, clinical brain death diagnosis must be confirmed by ancillary tests [4].

In France, brain death diagnosis and organ procurement are regulated by laws stating that confirmatory tests are mandatory. Initially, it was either two electroencephalograms (EEG) or cerebral

* Corresponding author at: Réanimation médico-chirurgicale, Hôpital Saint-Roch, CHU de Nice, rue Pierre-Dévoluy, 06001 Nice cedex 1, France.

Tel.: +33 4 92 03 33 00; fax: +33 4 92 03 35 58.

E-mail address: orban.jc@chu-nice.fr (J.-C. Orban).

angiography. Brain computed tomography angiography (CTA) was described in this indication by Dupas in 1998 [6]. The French agency governing organ procurement and transplantation, *Agence de la Biomédecine* (ABM), recognized this technique for confirming BD diagnosis in 2000. Interpretation criteria have been described by the French Society of Neuroradiology in 2007 [7] and were validated by the ABM the following year. More recently, brain death diagnosis criteria were further simplified [8].

Other ancillary tests such as the transcranial Doppler (TCD), the Bispectral Index (BIS) and somatosensory evoked potentials (SSEP) are used for confirmation of BD in some countries such as Germany [9]. In France, these tests have no legal value but they can shorten the time between clinical diagnosis of BD and confirmation by mandatory tests [10,11].

The French law on BD is clear (*décret n° 96-1041 du 2 décembre 1996* available at <http://www.legifrance.gouv.fr/affichTexte.do?cidTexte=LEGITEXT000005622176>), but there are no data on its application in the intensive care unit (ICU). This is why we conducted a survey of national practice on the use of confirmatory tests for the diagnosis of BD.

2. Patients and methods

2.1. Study design

We conducted a national survey on practice of brain death confirmation between November 15th, 2013 and February 15th, 2014. The survey was sent to all ICUs authorized to practice organ procurement and transplantation (188 units). Our ethics committee waived the need for ethical consent.

After phone agreement, a questionnaire was sent by e-mail to every ICU. During the initial phone call, we verified that practices were identical in each ICU. A senior doctor filled out a form for every unit.

2.2. Data collected

The questionnaire reported ICU characteristics, the number of brain dead patients admitted in the year 2012, the practice of ancillary tests, the availability and reasons for using the different mandatory tests and the influence of medical history on the choice of the mandatory confirmatory test.

2.3. Statistical analysis

Quantitative and qualitative data were reported as medians and interquartile ranges and percentages and 95% confidence intervals,

respectively. Comparisons of percentages were performed by a Fisher's exact test. A P value < 0.05 was considered statistically significant.

3. Results

3.1. Characteristics of respondents

Eighty-two out of 188 ICUs filled out the questionnaire (a response rate of 44%). Most of them were general hospitals (51% [40–62]), University Hospitals (44% [33–55]) and to a lesser extent private or military hospitals (5% [0–10]). Sixty percent of ICUs were involved in organ procurement only [49–71], whereas the remaining 40% [29–51] of units were involved in organ procurement and transplantation. In the year 2012, the median number of admissions per ICU was 649 [447–859] and the number of beds was 12 [10–18]. The number of brain dead patients admitted per ICU each year was 11 [5–22].

3.2. "Guiding" ancillary tests

Ancillary tests reducing the time between clinical diagnosis and confirmation by a mandatory test were performed in 80% [71–89] of ICUs. Most of the time, TCD was used alone [80%; 70–90]; less frequently, an association of TCD and BIS (15% [6–24]) was used and rarely another technique (5% [0.2–11]).

3.3. Confirmatory tests

CTA was the only confirmatory test available in every ICU, regardless of the time of day in 76 units (94% [88–100]). EEG could be performed in 80 ICUs (98% [94–102]) but, mainly during weekdays (61% [50–72]). Cerebral angiography was available only in half of ICUs (Fig. 1).

Seventy-eight ICUs (95% [90–100]) performed CTA as a confirmatory test. EEG and cerebral angiography were used in 54% [43–65] and 12% [3–17] of units, respectively. The use of CTA was more frequent than that of EEG (95% [90–100] vs. 54 [43–65%]; $P < 0.01$) and cerebral angiography (95% [90–100] vs. 12 [4–20%]; $P < 0.01$). Similarly, ICUs usually performed EEG as compared to cerebral angiography (54% [43–65] vs. 12 [4–20%]; $P < 0.01$). In most ICUs, these tests were performed between 1 and 6 hours after clinical diagnosis of brain death (Fig. 2). The time required for obtaining results varied widely. The imaging tests were interpreted within 15 minutes in 58% [47–69] of units and within 1 hour for others. EEG results were obtained mainly between

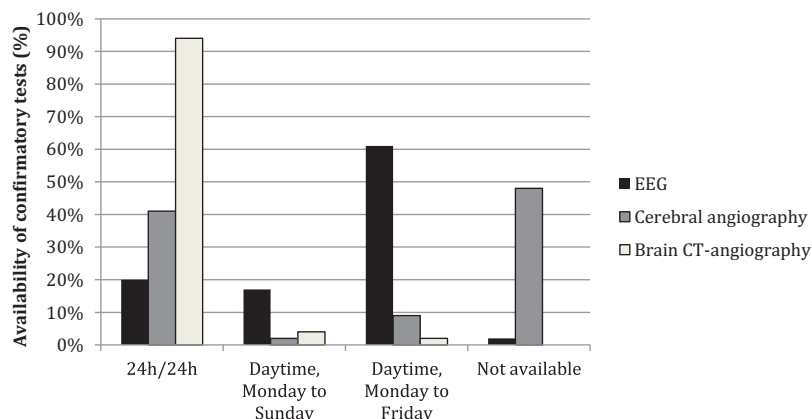


Fig. 1. Availability of confirmatory tests.

Download English Version:

<https://daneshyari.com/en/article/2741988>

Download Persian Version:

<https://daneshyari.com/article/2741988>

[Daneshyari.com](https://daneshyari.com)