Reversal to Whole-Brain Death Criteria After 15-Year Experience With Brain Stem Death Criteria in Poland


ABSTRACT

Polish brain-death criteria, similar to the original Harvard criteria, were published in 1984. In 1990, they were converted to brainstem death criteria, and were revised twice, in 1994 and in 1996. However, they could not be used in many complicated clinical situations such as intoxication, metabolic alterations, major facial injury, infratentorial lesions, and cervical spinal cord injury. The new Polish Transplant Act, passed by the Polish Parliament in 2005, recommends implementation of criteria for whole-brain death for brain-death diagnosis. In 2007, the Polish Ministry of Health Commission outlined new Polish brain-death criteria. Optional use of instrumental confirmatory tests was implemented in the new Polish national code of practice for the diagnosis of brain death in adults. In children up to age 2 years, instrumental tests are obligatory. Initially, there were problems in understanding the new, slightly more complicated classifications of primary and secondary brain injuries, infratentorial and supratentorial processes, modified apnea test. A broad commentary that addressed the most frequently asked questions was published in Anesthesiology and Intensive Therapy, the official journal of the Polish Society of Anaesthesiology and Intensive Therapy. This article dealt with most of the problems associated with implementation of the new criteria for diagnosis of brain death.

THE FIRST Polish guidelines for diagnosis of brain death established in 1984 were based on the concept of whole-brain death. Two instrumental confirmatory tests, electroencephalography and cerebral angiography, were mandatory. A few years later the concept of brainstem death, based on brainstem death criteria published in The United Kingdom in 1976, was accepted. Brainstem death criteria were first published in Poland in 1990 and were revised in 1994 and 1996. Pure clinical brainstem death criteria for diagnosis of brain death without recommendation of any confirmatory tests have recently been used in only 2 European countries, Poland and the United Kingdom.

After several years’ experience with use of brainstem death criteria, it has become clear that they can be controversial in clinical situations such as intoxication of any origin, severe facial trauma, biochemical derangement, unusual reflexes and spontaneous movements, primary infratentorial lesions, and high spinal cord injury. In the presence of these factors, most national guidelines recommend instrumental confirmatory tests for diagnosis of brain death. The situation became legally difficult in both Poland and the United Kingdom, where diagnostic dilemmas were widely discussed. Suggestions for implementation of brain perfusion or electrophysiologic tests in difficult situations were published in the British Journal of Anaesthesia in 2004, and similar recommendation of brain perfusion tests in cases with diagnostic doubt was published by us in 2002 in the Polish journal, Medycyna Intensywna i Ratunkowa (Intensive Care and Emergency Medicine).

We diagnose as many as 30 brain deaths annually, including a few in which confirmatory tests resolved diagnostic dilemmas. The most common reason for confirmatory testing was sedative use during patient treatment. Less frequent but also important factors were complex and...
sometimes unusual reflexes or spontaneous movements in patients who demonstrated complete brainstem areflexia and apnea. In such situations, doubt was expressed by nurses, experienced intensive therapy physicians, neurologists, or neurosurgeons. Although similar situations were reported in the literature, care givers were uncomfortable. Every physician involved in a difficult diagnosis of brain death stated that the diagnosis would be obvious if lack of brain perfusion was demonstrated.

It became clear that revision and updating of the Polish national guidelines was necessary; however, this would require an unknown and probably long period. Therefore, after careful study of the current literature about brain death diagnosis and discussion with the local ethical committee, we formulated a temporary local code of practice. In 1991, the chairs of the Departments of Anaesthesiology and Intensive Care, Neurosurgery, Neurology, and Diagnostic Imaging and Interventional Radiology recommended cerebral perfusion tests in difficult diagnoses. Initially, conventional angiography was performed. Later, when proper equipment became available, transcranial Doppler ultrasonography was the method of choice.

Contrary to the rest of Poland, our local protocol was the same as the guidelines in countries in which facultative use of instrumental confirmatory tests is recommended. Immediately after introduction of our local regulations, there was extensive discussion as to whether implementation of tests not mentioned in the Polish national guidelines could be legally accepted. After many meetings with medical and ethical authorities, it was concluded that instrumental confirmatory tests protect the patient against an improper brain-death diagnosis. Following our advice, many Polish centers began to use brain perfusion tests in cases in which there was doubt about the clinical diagnosis of brain death.

As a result of extensive discussions about diagnostic problems, it was recommended that whole-brain death rather than brainstem death be the criterion for diagnosis in the new Polish Transplant Act passed by The Polish Parliament in 2005. In 2007, The Polish Ministry of Health Commission elaborated new Polish brain death criteria. The new criteria are, in general, based on standard clinical brainstem death criteria and include the following:

1. Classification of patients by age group as neonates, infants aged 1 month to 2 years, children older than 2 years, adults.
2. Defining the minimal period of initial observation before beginning the first series of clinical tests for various age groups and for various reasons for brain death.
3. Introduction of obligatory instrumental confirmatory tests for diagnoses of brain death in children younger than 2 years and patients with an infratentorial process.
4. Introduction of optional instrumental confirmatory tests to shorten the time between the 2 series of clinical tests.
5. Introduction of precise information describing the most common spinal reflexes and atypical reflexes.

The choice of instrumental confirmatory tests is similar to that in other national codes of practice. The following became the approved standard:

1. Brain perfusion tests including cerebral arteriography, transcranial Doppler ultrasonography, and cerebral scintigraphy.
2. Electrophysiologic tests including electroencephalography, somatosensory evoked potentials, and auditory brainstem potentials. Angiographic computed tomography and computed tomographic perfusion tests are promising methods for the future. However, in the opinion of the Ministry of Health Commission, they are not reliable enough to become reference standards.

Poland is the first country to reverse national guidelines for brain death from brainstem death to whole-brain death. Initially, there were some difficulties in understanding the new, slightly more complicated classification of primary and secondary brain injuries, infratentorial and supratentorial processes, and the modified apnea test. An article in *Anaesthesiology and Intensive Therapy*, the official journal of the Polish Society of Anaesthesiology and Intensive Therapy, addressed most of the problems that developed after implementation of the new guidelines for diagnosis of brain death.

REFERENCES

10. Announcement of the Minister of Health of Poland regarding criteria and methods for the diagnosis of irreversible termination of brain function. Polish Monitor 2007, no. 46, position 547