

# **Part Two: Research Abstracts**

**TI: A 37-year-old man with severe head trauma, and a "hot nose" sign on brain flow study.**

AU: Baron-Michael {a}; Brasfield-James

AD: {a} Midway Medical Group, P.C., 28 Midway St, Bristol, TN, USA

SO: Chest-. Nov., 1999; 116 (5): 1468-1470.

PY: 1999

DT: Article-

IS: 0012-3692

LA: English

MC: Neurology- (Human-Medicine, Medical-Sciences)

ST: Hominidae-: Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-): adult-, male-, patient-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

DS: brain-death: nervous-system-disease; coma-: nervous-system-disease; severe-headtrauma: injury-, nervous-system-disease

MQ: computed-tomography: imaging-method; craniotomy-: surgical-method; radionucleotide-brain-flow-study: diagnostic-method

MI: Case-Study

ALT: Brain-Death-(MeSH); Coma-(MeSH)

AN: 200000036289

UD: 20000126

**TI: Ocular microtremor in brain stem death.**

AU: Bolger-Ciaran; Bojanic-Stana {a}; Phillips-Jack; Sheahan-Noirin; Coakley-Davis; Malone-James

AD: {a} Frenchay Hospital, Frenchay Park Road, Room 1, Academic Centre, Bristol, BS16 1LE, UK

SO: Neurosurgery-Baltimore. June, 1999; 44 (6): 1201-1206.

PY: 1999

DT: Article-

IS: 0148-396X

LA: English

LS: English

AB: OBJECTIVE: This study was undertaken to establish whether measurement of ocular microtremor (OMT) activity could be used as a method to establish brain stem death. Presently, the diagnosis of brain stem death can be made using clinical criteria alone. OMT is a high-frequency, low-amplitude physiological tremor of the eye caused by impulses emanating from the brain stem. There have been a number of reports indicating that the recording of OMT may be useful in the assessment of comatose states and in establishing brain stem viability or death. METHODS: We obtained the OMT recordings of 32 patients suspected of having brain stem death using the piezoelectric strain gauge technique. This method involves mounting the piezoelectric probe in a headset and lowering the rubber-tipped end piece onto the enesthetized scleral surface of the subject. The signal produced is recorded on audiomagnetic tape and later played back and analyzed on the electrocardiographic tape analyzer. RESU!

LTS: In 28 patients, initial clinical assessment confirmed the diagnosis of brain stem death and no OMT activity was recorded from these subjects. In three patients in whom initial clinical assessment demonstrated brain stem function, OMT activity was present; when brain stem death was subsequently diagnosed in these three patients, on OMT activity could be demonstrated. In the remaining patient, two of three OMT recordings demonstrated activity in spite of the absence of clinical evidence of brain stem function. A post mortem revealed bacterial cerebritis in this subject. CONCLUSION: The results suggest that OMT is a sensitive method of detecting brain stem life and that it could play an important role in the assessment of brain stem death.

AI: Y

MC: Neurology- (Human-Medicine, Medical-Sciences); Ophthalmology- (Human-Medicine, Medical-Sciences)

ST: Hominidae-: Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-): patient-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

DS: brain-stem-death: nervous-system-disease; coma-: nervous-system-disease; ocularmicrotremor: eye-disease, nervous-system-disease, physiological-tremor

ALT: Coma-(MeSH)

AN: 199900194709

UD: 19990723

**Intravenous angiography in brain death: report of 140 patients.**

AU: Author

Braum M; Ducrocq X; Huot JC; Audibert G; Anxionnat R; Picard L

AF: Author Affiliation

Department of Neuroradiology, Saint Julien University Hospital,  
Nancy, France.

SO: Source

Neuroradiology, 1997 Jun, 39(6):400-5

IS: ISSN

0028-3940

AB: Abstract

We present our experience and discuss the value of cerebral intravenous digital subtraction angiography (IV DSA) in the diagnosis of brain death. A total of 140 patients presenting with clinical signs of brain death were studied by IV DSA. According to the angiographic appearance of the vertebrobasilar system, the patients were divided into four groups. Cessation of blood flow within the internal carotid arteries and their branches was consistently found. Attention is focused on 9 patients with persistent blood flow within the posterior fossa. In sedated patients in whom EEG and evoked brain-stem responses are non-diagnostic, or in order to shorten the observation time, transcranial Doppler should be performed to determine the appropriate moment for IV DSA, which is a reliable method of confirming brain death.

LA: Language

English

PY: Publication Year

1997

PT: Publication Type

Journal Article

CP: Country of Publication

GERMANY

DE: Descriptors

Adolescence; Adult; Aged; Angiography, Digital Subtraction; Blood Flow Velocity: physiology; Brain: blood supply; Brain Death: radiography; Cerebral Angiography; Female; Human; Male; Middle Age; Predictive Value of Tests

LR: Last Revision Date

20001218

UD: Update

20020109

RO: Record Owner

National Library of Medicine

SF: Subfile

Index Medicus

AN: Accession Number

9225317

**Value of transcranial doppler ultrasonography compared with scintigraphic techniques and EEG in brain death]**

OT: Original Title

Die Wertigkeit der transkraniellen Dopplersonographie im Vergleich zu szintigraphischen Verfahren und EEG in der Hirntoddiagnostik.

AU: Author

Burger R; Schlake HP; Seybold S; Reiners C; Bendszus M; Roosen K

AF: Author Affiliation

Neurochirurgische Klinik, Universitat Wurzburg.

Ralf.Burger@klinik.uni-regensburg.de

SO: Source

Zentralblatt fur Neurochirurgie, 2000, 61(1):7-13

IS: ISSN

0044-4251

AB: Abstract

Since 1991 transcranial doppler sonography has been accepted in Germany as a technical confirmatory test for the assessment of a cerebral circulatory arrest in patients fulfilling the clinical criteria of brain death. This study correlated transcranial doppler findings to established scintigraphic methods such as planar scintigraphy, 99mTc-HMPAO SPECT and EEG patterns. 21 patients (15 males/6 females, mean age 15-69 yrs.) fulfilled all clinical criteria of brain death. They suffered from head injuries and spontaneous bleedings. All clinical and technical investigations were performed within 60-90 minutes. In 14/21 patients clinical findings and all confirmatory tests were consistent with brain death. Planar scintigraphy and SPECT gave completely corresponding results in all 21 patients. 7 patients showed not corresponding results. In two head-injured patients with skull defects TCD yielded an oscillating flow in the MCA but SPECT/planar scintigraphy gave a residual perfusion in the related brain areas. A corresponding residual EEG pattern was seen in one case. A patient with osteoclastic skull defect showed a collateral flow from the external carotid artery and another case a secondary reperfusion in depth of a regular expected MCA signal 12 hours after definitely verification of systolic spikes in the Circle of Willis. No cerebral perfusion was detectable in the scintigraphic techniques. In the three remainder with rest activity in EEG, TCD and radionuclide methods showed no intracranial perfusion. In the presence of open skull fractures, external liquor drainages and osteoclastic craniotomies oscillating flow in TCD does not constantly represent a cerebral circulatory arrest. Awaiting of systolic spikes is absolutely necessary, if no radionuclide method is available. Determination of brain death by TCD should be carried out by an experienced investigator since unexpected collateral flow signals can be misinterpreted.

LA: Language

German

PY: Publication Year

2000

PT: Publication Type

Journal Article

CP: Country of Publication

GERMANY

DE: Descriptors

Adolescence; Adult; Aged; Brain: radionuclide imaging; Brain  
Death: diagnosis; Brain Death: radionuclide imaging; Brain Death:  
ultrasonography; Comparative Study; Electroencephalography;  
English Abstract; Female; Human; Male; Middle Age;  
Radiopharmaceuticals: diagnostic use; Technetium Tc 99m  
Exametazime: diagnostic use; Tomography, Emission-Computed,  
Single-Photon; Ultrasonography, Doppler, Transcranial  
RN: CAS Registry Number  
0 (Radiopharmaceuticals); 100504-35-6 (Technetium Tc 99m  
Exametazime)  
LR: Last Revision Date  
20001218  
UD: Update  
20020109  
RO: Record Owner  
National Library of Medicine  
SF: Subfile  
Index Medicus  
AN: Accession Number  
10859795

**TI: Blood pressure and heart rate variability and baroreflex sensitivity before and after brain death.**

AU: Conci-F; Di-Rienzo-M; Castiglioni-P {a}

AD: {a} LaRC Centro di Bioingegneria, Centro di Bioingegneria, Fondazione Don Gnocchi IRCSS-ONLUS and Politecnico di Milano, Via Capecelatro, I-20148, Milan: [castigli@mail.cbi.polimi.it](mailto:castigli@mail.cbi.polimi.it), Italy

SO: Journal-of-Neurology-Neurosurgery-and-Psychiatry. [print] November, 2001; 71 (5): 621-631.

PY: 2001

DT: Article-

IS: 0022-3050

LA: English

LS: English

AB: Objectives: To evaluate spontaneous blood pressure and heart rate variability and spontaneous baroreflex sensitivity before and after brain death. Methods: Spontaneous variability of arterial blood pressure and heart rate-estimated by power spectra of systolic (SBP) and diastolic blood pressure (DBP) and pulse interval (PI)-and spontaneous baroreflex sensitivity (BRS)-estimated by the alpha index and the sequence technique -were evaluated in 11 patients twice: shortly before and 1 hour after the onset of brain death. Results: Significant spectral changes occurred after brain death: a general power reduction in PI spectra; a shift of SBP, DBP and PI powers toward the lower frequencies, resulting in a greater slope of the "1/f" spectral trends; and a marked reduction of SBP and DBP powers (-93%) and of SBP-PI coherence (-63%) at 0.1 Hz. The estimated average BRS was relatively high before brain death (around 11 ms/mm Hg), and fell close to 0 or even was not detectable at all after brain death.

Conclusions: Parameters describing spontaneous blood pressure and heart rate variability and indexes reflecting the baroreflex function, which were relatively normal up to a few hours before brain death, underwent marked changes with the onset of brain death. All the changes found are likely to reflect the cessation of activity of the cardiovascular brain stem centres. These findings indicate that techniques of blood pressure and heart rate spectral analysis and of dynamic assessment of baroreflex sensitivity may be useful to complement the diagnosis of brain stem death.

AI: Y

MC: Cardiovascular-System (Transport-and-Circulation); Neurology- (Human -Medicine, Medical-Sciences)

ST: Hominidae-: Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-): patient-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

PS: brain-: nervous-system; brainstem-: nervous-system

DS: brain-death: nervous-system-disease

MI: diastolic-blood-pressure; heart-rate-variability; pulse-interval; spontaneous-baroreflex-sensitivity; systolic-blood-pressure

ALT: Brain-Death-(MeSH)

AN: 200100355265

UD: 20011120

**TI: DIAGNOSIS OF BRAIN DEATH SUPERIORITY OF PERFUSION STUDIES WITH TECHNETIUM**

-99M-HMPAO OVER CONVENTIONAL RADIONUCLIDE CEREBRAL ANGIOGRAPHY.

AU: DE-LA-RIVA-A {a}; GONZALEZ-F-M; LLAMAS-ELVIRA-J-M; LATRE-J-M; JIMENEZ

-HEFFERNAN-A; VIDAL-E; MARTINEZ-M; TORRES-M; GUERRERO-R; ET-AL  
AD: {a} SERV MED NUCLEAR, HOSP "REINA SOFIA", AVDA MENENDEZ  
PIDAL S/N, 14004  
CORDOBA, SPAIN

SO: British-Journal-of-Radiology. 1992; 65 (772): 289-294.

PY: 1992

DT: Article-

IS: 0007-1285

LA: ENGLISH

AB: The use of technetium-99m hexamethyl-propyleneamine oxime (99Tcm-HMPAO) in

the diagnosis of brain death has been evaluated in 41 studies of 37 patients with severe brain injury, who were under the effect of drugs or when other diagnostic methods were equivocal. HMPAO studies were compared with conventional radionuclide angiography performed simultaneously by intravenous administration of HMPAO as a bolus. The ages of patients ranged from 4 months to 75 years. Dynamic flow images and 5-min static uptake images were acquired following bolus injection of 555 Mbq of 99Tcm-HMPAO. All patients showing no brain uptake was confirmed as brain-dead by standard clinical criteria, with no contradictory cases in the static study. In addition, all patients who were not brain-dead showed HMPAO uptake at least in the brainstem. Dynamic flow images were equivocal in five patients, four of whom had no uptake on static images and clinically confirmed brain death. In addition, two other cases showed "mismatched" dynamic and static images: in one case no perfusion was observed on flow images but uptake restricted to the posterior fossa was seen on static images; the other case showed perfusion on the dynamic study and static imaging revealed hemisphere uptake with no posterior fossa uptake. Static perfusion 99Tcm-HMPAO studies offer advantages over conventional brain scintigraphy, better results being due to adequate assessment of posterior fossa activity and avoiding equivocal studies.

AI: Y

ST: Hominidae-; Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

MI: HUMAN HEXAMETHYL-PROPYLENEAMINE OXIME DIAGNOSTIC-DRUG  
DIAGNOSTIC METHOD

MJCC: CC20506 (Nervous-System-Pathology)

CC06504 (Radiation-Radiation-and  
-Isotope-Techniques)

CC11106 (Anatomy-and-Histology-General-and  
-Comparative-Radiologic-Anatomy)

CC12504 (Pathology-General-and  
-Miscellaneous-Diagnostic)

CC12510 (Pathology-General-and-Miscellaneous  
-Necrosis)

CC22005 (Pharmacology-Clinical-Pharmacology)  
CC22024

(Pharmacology-Neuropharmacology)

MNCC: CC01012 (Methods-Materials-and-Apparatus-General-Photography)  
CC10060

(Biochemical-Studies-General)  
CC14501 (Cardiovascular-System-General  
-Methods)  
BC: BC86215 Hominidae  
AN: 199294019954  
UD: 1992

**TI: Brain death and transcranial Doppler: Experience in 130 cases of brain dead patients.**

AU: Ducrocq-Xavier {a}; Braun-Marc; Debouverie-Marc; Junges-Christel; Hummer-Mireille; Vespignani-Herve

AD: {a} Serv. Neurologie, Hopital Saint Julien, 1 Rue Foller, C.O. 34, 54035 Nancy Cedex, France

SO: Journal-of-the-Neurological-Sciences. Sept. 18, 1998; 160 (1) 41-46.

PY: 1998

DT: Article-

IS: 0022-510X

LA: English

AB: Background and purpose: Diagnosis of brain death requires confirmation of the clinical diagnosis by appropriate tests, generally electroencephalography (EEG) and angiography. The diagnostic limitations or logistical problems inherent to these tests indicate the need to develop other more appropriate methods. The results obtained with transcranial Doppler (TCD) led us to conduct this prospective study of TCD recordings in brain dead patients. Methods: 130 patients, aged 2-88 years were diagnosed as brain dead between July 1987 and June 1993. Clinical criteria were confirmed in all cases by EEG (n = 88) and or angiography (n = 64). Intracranial anterior circulation was insonated via temporal windows or, when impossible, via a transorbital approach. The posterior circulation was studied only in more recent patients. Examinations were made as soon as possible after brain death diagnosis and repeated for about 30 min. Vital parameters and treatments were taken into account. Results: There was only one false negative result, in a patient with an extended skull defect, who retained TCD and angiographic intracranial circulation despite confirmed irreversible brain death. All other patients displayed typical ultrasonic patterns of cerebral circulation arrest: an oscillating signal (n = 190, 73%), a systolic spike (n = 62, 24%) or a unilateral absence of signal (n = 5). Despite a total correlation for positive diagnosis, TCD and angiography may differ as to the level of circulation arrest. TCD is useful for patients under sedative drugs. No false positive result was encountered but we were unable to insonate any intracranial artery in 5 patients. Conclusion: Data from previous studies and the results of this study indicate that TCD is a very sensitive and safe method for diagnosing cerebral circulatory arrest. TCD may be used as a confirmatory test alongside EEG and angiography. TCD is more widely applicable than EEG and may be earlier and safer than angiography.

AI: Y

MC: Methods-and-Techniques; Neurology- (Human-Medicine, Medical-Sciences)

ST: Hominidae-: Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-); patient-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

MQ: angiography-: analytical-method; electroencephalography- [EEG-]: analytical-method; transcranial-Doppler: analytical-method

MI: brain-death; cerebral-circulatory-arrest

AN: 199800513767

UD: 19981021

**TI: BRAIN DEATH DETERMINATION WITH BRAIN STEM EVOKED POTENTIALS AND RADIONUCLIDE ISOTOPE STUDIES.**

AU: ERBENGI-A {a}; ERBENGI-G; CATALTEPE-O; TOPCU-M; ERBAS-B; ARAST  
AD: {a} HACETTEPE UNIV MED SCH, DEP NEUROSURGERY, ANKARA,  
TURKEY

SO: Acta-Neurochirurgica. 1991; 112 (3-4): 118-125.

PY: 1991

DT: Article-

IS: 0001-6268

LA: ENGLISH

AB: Thirty-three patients fulfilling the clinical criteria for brain death were tested by Brainstem Auditory Evoked Potentials (BAEP) and Radionuclide Cerebral Angiography and Brain Perfusion Studies. There was a significant correlation between the BAEP and radionuclide study outcomes. All patients with absence of BAEP showed no cerebral perfusion. These findings, added to the clinical findings, resulted in a final diagnosis of brain death in all patients. It is concluded that BAEP and Radionuclide Cerebral Perfusion studies are useful adjuncts for proving that brain death has really occurred.

AI: Y

ST: Hominidae-; Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

MI: HUMAN CLINICAL DEATH CEREBRAL PERFUSION EARLY  
RECOGNITION DIAGNOSTIC METHOD

MJCC: CC20506 (Nervous-System-Pathology)

CC11106 (Anatomy-and-Histology-General-and-Comparative-Radiologic-Anatomy)

CC12504 (Pathology-General-and-Miscellaneous-Diagnostic)

CC12510 (Pathology-General-and-Miscellaneous-Necrosis)

CC20504 (Nervous-System-Physiology-and-Biochemistry)

MNCC: CC15002 (Blood-Blood-Forming-Organs-and-Body-Fluids-Blood-and-Lymph-  
Studies)

AN: 199293079611

UD: 1992

**TI: PYRAMIDAL TRACT FUNCTION DURING ONSET OF BRAIN DEATH.**

AU: FIRSCHING-R {a}; WILHELMS-S; CSESCEI-G

AD: {a} KLINIK NEUROCHIRURGIE, UNIVERSITAET ZU KOELN, J  
STELZMANNSTRASSE 9,

5000 COLOGNE 41, GERMANY

SO: Electroencephalography-and-Clinical-Neurophysiology. 1992; 84 (4): 321-324.

PY: 1992

DT: Article-

IS: 0013-4694

LA: ENGLISH

AB: In 51 patients with primary brain lesions, who fulfilled the criteria of brain death, sequential recording of transcranial magnetic evoked potentials (TMEPs) and somatosensory evoked potentials (SEPs) were performed. In all comatose patients with apnoeic cranial nerve areflexia the TMEP could not be elicited, while the response after cervical magnetic stimulation was always preserved. Similarly, no cortical SEPs were preserved in apnoeic cranial nerve areflexia; however, the cervical somatosensory response was preserved in 44%. In deteriorating patients with coma grade III TMEPs were preserved in 3 instances, while cortical SEPs were already absent. Current brain death criteria, however, were not challenged, as TMEPs were absent in all 51 patients, at the latest when apnoea was noted.

AI: Y

ST: Hominidae-; Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

MI: HUMAN TRANSCRANIAL MAGNETIC EVOKED POTENTIALS

SOMATOSENSORY EVOKED

POTENTIALS COMA APNEIC CRANIAL NERVE AREFLEXIA CERVICAL

MAGNETIC

STIMULATION

MJCC: CC20506 (Nervous-System-Pathology)

CC16006 (Respiratory-System

-Pathology)

CC20504 (Nervous-System-Physiology-and-Biochemistry)

BC: BC86215 Hominidae

AN: 199294098851

UD: 1992

**TI: Radionuclide angiography as a confirmatory test for brain death: A review of 229 studies in 219 patients.**

AU: Flowers-W-M-Jr {a}; Patel-Bharti-R

AD: {a} Dep. Radiol., Univ. Miss. Med. Cent., 2500 N. State St., Jackson, MS 39216, USA

SO: Southern-Medical-Journal. Nov., 1997; 90 (11) 1091-1096.

PY: 1997

DT: Article-

IS: 0038-4348

LA: English

AB: Background. Radionuclide angiography (RA) has been used for many years to confirm the clinical diagnosis of brain death, but quantitative data regarding the technique are unavailable. Methods. We conducted a retrospective review of 229 RA procedures done in 219 patients. Results. Of 206 patients who had interpretable studies and met clinical criteria for brain death (profound coma, absent brain stem reflexes, and apnea), including 10 patients who had repeated studies, 203 (98.5% sensitivity) had positive studies, and 6 (2.9%) had negative studies. Of nine patients who had interpretable studies and did not meet the clinical criteria for brain death, five (56% specificity) had positive studies and four (44%) had negative studies. Conclusions. Radionuclide angiography is a sensitive confirmatory test of brain death. The study does not evaluate the posterior fossa circulation, and an occasional patient may have residual brain stem function. The examination is most reliable when the patient is in a deep coma, has no brain stem reflexes, and has failed a formal apnea test.

AI: Y

MC: Neurology- (Human-Medicine, Medical-Sciences)

ST: Hominidae-: Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-): patient-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

DS: brain-death: diagnosis-, nervous-system-disease

MQ: radionuclide-angiography: diagnostic-method

AN: 199800036384

UD: 19971124

**TI: Accuracy of clinical evaluation in the determination of brain death.**

AU: Flowers-W-Mel-Jr {a}; Patel-Bharti-R

AD: {a} Department of Radiology, University of Mississippi Medical Center, 2500 N State St, Jackson, MS, 39216, USA

SO: Southern-Medical-Journal. Feb., 2000; 93 (2): 203-206.

PY: 2000

DT: Article-

IS: 0038-4348

LA: English

LS: English

AB: Background: The accuracy of the clinical diagnosis of brain death has never been established. Methods: Seventy-one consecutive clinically brain dead patients were studied retrospectively. Inclusion criteria were complete cessation of brain function with profound coma of known cause, complete absence of brain stem reflexes, and apnea, all persisting for at least 6 hours. A formal apnea test with a documented PCO<sub>2</sub> of >60 mm Hg was required. All evaluations were done by experienced neurosurgery or neurology resident or staff physicians. The clinical diagnosis was compared with the results of radionuclide angiography and with the clinical course and final outcome. Results: Seventy patients had no arterial blood flow on radionuclide angiography. One blood flow study was considered to have yielded a false-negative result. No patient recovered or survived. Conclusions: The clinical diagnosis of brain death is highly reliable when made by experienced examiners using established criteria. In this study, the accuracy was 100%.

AI: Y

MC: Neurology- (Human-Medicine, Medical-Sciences)

ST: Hominidae-: Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-): patient-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

DS: brain-death: accuracy-, clinical-diagnosis, nervous-system-disease

MQ: brain-death-determination: determination-method; formal-apnea-test: diagnosticmethod;

radionuclide-angiography: diagnostic-method

MI: accurate-clinical-evaluation; arterial-blood-flow

ALT: Brain-Death-(MeSH)

AN: 200000116186

UD: 20000417

**Brain death: MR and MR angiography**

AU: Author

Ishii, K; Onuma, T; Kinoshita, T; Shiina, G; Kameyama, M; Shimosegawa, Y

AF: Author Affiliation

Dep. Radiol., Sendai City Hosp., Shimizukoji 3-1, Wakabayashi-ku, Sendai,  
980, Japan

SO: Source

American Journal of Neuroradiology [Am. J. Neuroradiol.], vol. 17, no. 4,  
pp. 731-735, Apr 1996

IS: ISSN

0195-6108

AB: Abstract

Four patients in whom brain death was identified on the basis of neurologic and electroencephalographic findings were examined with MR imaging and MR angiography. MR images showed diffuse swelling of the cerebral gyri and cerebellar cortex, with prolongation of both the T1 and T2 signal (representing hypoxic ischemic brain injury), downward displacement of the diencephalon and the brain stem (central and tonsillar herniation), and loss of flow void in the intracranial portions of both internal carotid arteries. MR angiograms did not show the intracranial vessels above the level of the supraclinoid portion of the internal carotid arteries. MR angiography and MR imaging are noninvasive and reliable methods for use in determining brain death.

LA: Language

English

SL: Summary Language

English

PY: Publication Year

1996

PT: Publication Type

Journal Article

DE: Descriptors

injuries; ischemia; magnetic resonance imaging

ID: Identifiers

man; MRI; brain

CL: Classification

N3 11021 Neuroimaging techniques

UD: Update

199705

SF: Subfile

CSA Neurosciences Abstracts

AN: Accession Number

4030043

RO: Record Owner

National Library of Medicine

SF: Subfile

BIOETHICSLINE; Index Medicus

AN: Accession Number

**TI: Orbital Doppler sonography findings in cases of brain death.**

AU: Karaali-Kamil {a}; Cevikol-Can; Senol-Utku; Arici-Gulbin; Kabaalioglu-Adnan; Ramazanoglu-Atilla; Bircan-Oguz

AD: {a} Tip Fakultesi, Radyoloji ABD, Akdeniz Universitesi, 07070, Antalya, Turkey

SO: AJNR-. May, 2000; 21 (5): 945-947.

PY: 2000

DT: Article-

IS: 0195-6108

LA: English

LS: English

AB: In this study, we investigated the blood flow velocity changes in orbital arteries by using Doppler sonography in eight patients with brain death. Peak-systolic and enddiastolic velocities and resistive indices of the ophthalmic and central retinal arteries were evaluated. We observed the absence or reversal of end-diastolic blood flow in these arteries. To our knowledge, this finding has not been previously reported to be associated with brain death.

AI: Y

MC: Cardiovascular-Medicine (Human-Medicine, Medical-Sciences); Neurology- (Human-Medicine, Medical-Sciences); Radiology- (Medical-Sciences)

ST: Hominidae-: Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-): patient-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

PS: central-retinal-artery: circulatory-system, sensory-system; orbital-artery: circulatorysystem, sensory-system

DS: brain-death: nervous-system-disease

MQ: orbital-Doppler-sonography: evaluation-method

MI: blood-flow-velocity: end-diastolic, peak-systolic

ALT: Brain-Death-(MeSH)

AN: 200000181493

UD: 20000613

**TI: Parasympathetic activity in brain death: Effect of apnea on heart rate variability.**

AU: Kawamoto-M {a}; Sera-A; Kaneko-K; Yuge-O; Ohtani-M

AD: {a} Dep. Anesthesiol. Critical Care, Hiroshima Univ. Hosp., Kasumi 1-2-3, Minami-ku, Hiroshima 734, Japan

SO: Acta-Anaesthesiologica-Scandinavica. Jan., 1998; 42 (1) 47-51.

PY: 1998

DT: Article-

IS: 0001-5172

LA: English

AB: Background: Power spectral analysis of heart rate variability is a useful monitoring of brain-damaged patients. However, the effect of artificial ventilation is not clearly demonstrated in assessing vagal activity because the locus of its activity is originated close to the respiratory center in the brain stem. We studied heart rate variability during artificial ventilation and apnea test as part of an assessment of brain death. spectral components before, during and after the apnea test. Before the test, circulatory and blood gas variables and electrocardiographic recording were obtained under controlled mechanical ventilation at a rate of 12 and 18 (/min), each for 5 min. Measurements were made for 10 min during the apnea test, and repeated thereafter as before the test. Power spectral analysis based on fast Fourier transformation was made by integrating each low- (LF: 0.04-0.15 Hz) and high- (HF: 0.15-0.40 Hz) frequency band areas. LF was assessed as sympathetic and pa!

rasympathetic nervous activity, and HF as respiratory-related parasympathetic vagal activity. The HF/LF ratio showed sympathovagal balance. Results: All patients were assessed as brain dead. During apnea, PaCO<sub>2</sub> (P<0.01) and LF (P<0.05) increased, and pH (P<0.01) and HF/LF ratio (P<0.05) decreased. Heart rate, mean arterial pressure, PaO<sub>2</sub> and HF remained consistent throughout. Conclusion: It was shown that sympathovagal balance was inclined to be sympathotonic during apnea, and that there were no changes in the respiratory-related vagal activity in spite of stopping artificial ventilation.

AI: Y

MC: Cardiovascular-Medicine (Human-Medicine, Medical-Sciences); Neurology- (Human-Medicine, Medical-Sciences); Pulmonary-Medicine (Human-Medicine, Medical-Sciences)

ST: Hominidae-: Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-): patient-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

PS: cardiac-autonomic-nervous-system: circulatory-system, nervous-system

DS: apnea-: respiratory-system-disease; brain-death: nervous-system-disease

MQ: artificial-respiration: therapeutic-method

MI: heart-rate-variability; parasympathetic-activity

AN: 199800124544

UD: 19980126

**TI: Brain death and organ donation in Germany: Analysis of procurement in a neurosurgical unit and review of press reports.**

AU: Kleindienst-A {a}; Haupt-W-F; Hildebrandt-G

AD: {a} Department of Neurosurgery, Staedt. Klinikum Dessau, Auenweg 38, 06822, Dessau, Germany

SO: Acta-Neurochirurgica. 1999; 141 (6): 641-646.

PY: 1999

DT: Article-

IS: 0001-6268

LA: English

LS: English

AB: Objective. A prospective study was undertaken to determine the number of potential organ donors in a neurosurgical intensive care unit and to record the actual number of organ donations. The reasons for refusal of organ donations were analysed with respect to the controversial public discussion of the brain death concept and the transplantation law in Germany. Methods. From 1994 to 1997, the number of cases of brain death, and the number of cases in which relatives consented or refused to organ donation as well as the number of actual organ explantations was recorded. Over the same period, press reports of 5 German language newspapers were analysed with regard to the authors' position on brain death and transplantation law, their qualification, intention, and mode of presentation. Results. Annually, about 70 deaths occurred on the department's intensive care unit of which almost 30% of the patients were determined to have suffered brain death without any obvious contraindications against organ donation.

The refusal rate of relatives rose from 56% up to 78%, and the rate of organ donors thus decreased from 5% in 1994 to 4% presently in the department. About 100 reports were published each year in the analysed newspapers, of which about 90% voiced approval of organ transplantation. During the review period, the depiction became more objective (57% in 1994 to 82% in 1997) and the suspicious attitude toward the technique of brain death diagnosis declined. Whereas 50% of the articles rejected the brain death concept in 1994, this figure decreased to 39% in 1997 and conversely the concept of consent rose from 33% in 1994 to 56% in 1997. Conclusion. In Germany, the relatives refusal rate in organ donation is continuously high, presumable due to a depressing 39% of press reports rejecting the brain death concept, and resulting in a very low number of organ donations. There is hope that the transplantation law which has finally passed German parliament!

in 1997, confirming the brain death concept as well as the legal principle of prior consent by the donor or consent by the relatives will eventually result in an increase of organ donation especially when supported by an educational campaign which is embodied in the transplantation law.

AI: Y

MC: Government-and-Law; Neurology- (Human-Medicine, Medical-Sciences); Public-Health (Allied-Medical-Sciences)

ST: Hominidae-; Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-); organ-donor

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

GE: Germany- (Europe-, Palearctic-region)

DS: brain-death: nervous-system-disease, press-reports

MI: neurosurgical-intensive-care-unit; organ-donation: frequency-, prior-donor-consent, relatives-refusal-rate; organ-transplantation-law: educational-campaign, press-reports

ALT: Brain-Death-(MeSH)

AN: 199900259478

UD: 19990921

**Computer aided analysis of heart rate variability in brain death.**

AU: Author

Knuttgen D; zur Nieden K; Muller-Gorges MR; Jahn M; Doehn M

AF: Author Affiliation

Department of Anesthesiology, Kliniken der Stadt Koln, Cologne, Germany.

SO: Source

International journal of clinical monitoring and computing, 1997

Feb, 14(1):37-42

IS: ISSN

0167-9945

AB: Abstract

Forty neurosurgical, artificially ventilated patients were examined. Twenty of them had been diagnosed as brain dead, while twenty non-brain-dead patients served as a control group. From a surface ECG taken over a period of five minutes the mean heart rate and various indices of heart rate variability (HRV) were determined with the help of a special computer program (ProSciCard, Medisyt, Germany). The heart rate of the brain dead was significantly higher than that of the control patients. By contrast, all parameters of HRV were drastically reduced in the brain dead individuals compared to the controls. The results show that a significant change in the course of heart rate occurs after manifestation of brain death. This would appear to be the result of the elimination of all vegetative impulses derived from the brainstem. Computer-aided, the changes can be quantified in a simple way. The method could therefore be useful in brain death diagnosis.

LA: Language

English

PY: Publication Year

1997

PT: Publication Type

Journal Article

CP: Country of Publication

NETHERLANDS

DE: Descriptors

Adult; Algorithms; Brain Death: diagnosis; Brain Death: physiopathology; Brain Stem: physiopathology; Case-Control Studies; Diagnosis, Computer-Assisted; Electrocardiography; Female; Heart Rate: physiology; Human; Male; Middle Age; Statistics, Nonparametric

LR: Last Revision Date

20001218

UD: Update

20020109

RO: Record Owner

National Library of Medicine

SF: Subfile

Index Medicus

AN: Accession Number

9127783

**[On the determination of brain death]**

OT: Original Title

W sprawie orzekania stanu smierci mozgu.

AU: Author

Kwiecinski H; Kaminska A; Kowalski J; Mieszkowski J; Pniewski J

AF: Author Affiliation

Kliniki Neurologicznej AM, Warszawie.

SO: Source

Neurologia i neurochirurgia polska, 1994, 28(1 Suppl 1):157-66

IS: ISSN

0028-3843

NT: Notes

Erratum in: Neurol Neurochir Pol 1994 Sep-Oct;28(5):787

AB: Abstract

In a prospective study of 20 cases of brain-stem death, EEG and TCD studies were correlated with clinical findings. We suggest that TCD can be incorporated into institutional protocols as a rapid and useful technique for confirmation of brain death. Our observations underline the need for electrophysiological confirmation (evoked potentials) of brain-stem death in patients with primary infratentorial lesions.

LA: Language

Polish

PY: Publication Year

1994

PT: Publication Type

Journal Article

CP: Country of Publication

POLAND

DE: Descriptors

Adult; Aged; Brain Death: diagnosis; Electroencephalography;

English Abstract; Female; Human; Male; Middle Age; Time Factors;

Ultrasonography, Doppler, Transcranial

LR: Last Revision Date

20001218

UD: Update

20020109

RO: Record Owner

National Library of Medicine

SF: Subfile

Index Medicus

AN: Accession Number

**Brain-stem auditory evoked potential monitoring. The increase of the stimulus artifact in the development of brain death: A biological phenomenon?**

AU: Author

Litscher, G; Schwarz, G; Jobstmann, R; Kehl, G; Kleinert, R

AF: Affiliation

Department of Anesthesiology and Intensive Care Medicine,  
University of Graz, Auenbruggerplatz 29, A-8036 Graz, Austria

SO: Source

International Journal of Neuroscience [INT. J. NEUROSCI.]. Vol.  
91, no. 1-2, pp. 95-103. 1997.

IS: ISSN

0020-7454

AB: Abstract

Brain-stem auditory evoked potentials (BAEPs) were recorded in 12 dead subjects (mean age, 72.6 plus or minus 14.8 years), 30.6 plus or minus 19.5 hours (range 9-70) after abolished systemic circulation. Death was due to cardiac failure (n = 10), intracerebral hemorrhage (n = 1) and larynx cancer (n = 1). The presence and amplitude of the stimulus artifact were evaluated. The mean ( plus or minus SD) amplitudes of the stimulus artifact was 0.03 plus or minus 0.02 mu V on the left side and 0.01 plus or minus 0.02 mu V on the right side. These findings in accordance with previous studies on comatose patients and brain dead subjects confirm that the increase of the stimulus artifact in the development of brain death, in spite of stimulation with alternating polarity, seems to reflect a biological phenomenon which is not found in dead subjects after complete cessation of systemic circulation.

LA: Language

English

SL: Summary Language

English

PY: Publication Year

1997

PT: Publication Type

Journal Article

DE: Descriptors

auditory evoked potentials; brain stem; coma; death; brain

ID: Identifiers

man

CL: Classification

N3 11067 Clinical neurophysiology (EEGs, EMGs, EPs)

UD: Update

199808

SF: Subfile

CSA Neurosciences Abstracts

AN: Accession Number

4346665

F1: Fulltext Info

0020-7454,91,1-2,95-103,1997

A1: Alert Info

20011231

**TI: Findings on Tc-99m HMPAO brain imaging in brain death.**

AU: Lu-G; Shih-W-J {a}; Ryo-U-Y

AD: {a} Nuclear Med. Serv., VA Medical Cent., Lexington, KY 40511, USA

SO: Clinical-Nuclear-Medicine. 1996; 21 (11) 891-893.

PY: 1996

DT: Case-Study; Note-

IS: 0363-9762

LA: English

MC: Cardiovascular-System (Transport-and-Circulation); Nervous-System (Neural-Coordination); Pathology-; Radiation-Biology

ST: Hominidae-; Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-)

TN: animals-; chordates-; humans-; mammals-; primates-; vertebrates-

MI: BRAIN-DEATH; CEREBRAL-BLOOD-FLOW; IMAGING-METHOD;

NERVOUS-SYSTEM-DISEASE;

NEUROLOGY-; PATIENT-; RADIOLOGY-; TC-99MHEXAMETHYLPROPYLENE-

BRAIN-IMAGING

AN: 199799293527

**Analysis and classification of nasopharyngeal electroencephalogram in "brain death" patients.**

AU: Author

Okii Y; Akane A; Kawamoto K; Saito M

AF: Author Affiliation

Department of Legal Medicine, Kansai Medical University,  
Moriguchi, Japan.

SO: Source

Nippon hoigaku zasshi. The Japanese journal of legal medicine,  
1996 Apr, 50(2):57-62

IS: ISSN

0047-1887

AB: Abstract

Nasopharyngeally-derived electroencephalogram (EEG) was recorded and digitized in 12 "brain death" subjects with flat-line scalp EEG and loss of auditory brain stem response. The nasopharyngeal EEGs of these cases were classified into three types: Type Ia with complete flat-line, Type Ib with almost but incomplete flat-line EEG, and Type II with low-amplitude slow fluctuations.

Digitization of the nasopharyngeal EEG showed that equivalent electric potentials in low frequency bands (delta and/or theta 1) remained within the values of healthy volunteers in Types Ib and II. These results suggested that the tissue in or around the brain stem still functioned in Type Ib and II "brain death" patients.

The origin of nasopharyngeal EEG was also discussed in this paper.

LA: Language

English

PY: Publication Year

1996

PT: Publication Type

Journal Article

CP: Country of Publication

JAPAN

DE: Descriptors

Adolescence; Adult; Aged; Brain Death: diagnosis; Brain Death: physiopathology; Brain Stem: physiopathology; Electrodes; Electroencephalography: classification; Electroencephalography: methods; Evoked Potentials, Auditory, Brain Stem; Female; Human; Male; Middle Age; Nose: physiopathology; Pharynx: physiopathology; Support, Non-U.S. Gov't

LR: Last Revision Date

20001218

UD: Update

20020109

RO: Record Owner

National Library of Medicine

SF: Subfile

Index Medicus

AN: Accession Number

8691650

**Evaluating brain death with positron emission tomography: case report on dynamic imaging of 18F-fluorodeoxyglucose activity after intravenous bolus injection.**

AU: Author

Meyer MA

AF: Author Affiliation

Biomedical Imaging Center, University of Tennessee Medical Center, Knoxville, USA.

SO: Source

Journal of neuroimaging : official journal of the American Society of Neuroimaging, 1996 Apr, 6(2):117-9

IS: ISSN

1051-2284

AB: Abstract

A dynamic positron emission tomography (PET) study of the head was performed over 1 hour after the intravenous bolus administration of 18F-fluorodeoxyglucose (18F-FDG) to a 18-year-old patient with the clinical diagnosis of brain death. This dynamic PET study was performed on the seventh day after a severe posttraumatic closed-head injury. No intracerebral uptake or retention of tracer was noted, consistent with a diffuse absence of brain metabolism. A small amount of tracer was noted to slowly rise over time within the sagittal sinus, indicating that visualization of sagittal sinuses on technetium 99m-diethylene-triaminepentaacetic acid planar images could provide a falsely negative scintigraphic evaluation for the presence of brain death. It is concluded that PET FDG imaging may be a useful technique in evaluating patients for brain death.

LA: Language

English

PY: Publication Year

1996

PT: Publication Type

Journal Article

CP: Country of Publication

UNITED STATES

DE: Descriptors

Adolescence; Brain: metabolism; Brain Death: radionuclide imaging; Case Report; Cranial Sinuses: metabolism; Deoxyglucose: administration & dosage; Deoxyglucose: analogs & derivatives; Deoxyglucose: diagnostic use; Deoxyglucose: pharmacokinetics; Female; Fludeoxyglucose F 18; Fluorine Radioisotopes: administration & dosage; Fluorine Radioisotopes: diagnostic use; Fluorine Radioisotopes: pharmacokinetics; Head Injuries, Closed: radionuclide imaging; Human; Injections, Intravenous; Support, Non-U.S. Gov't; Technetium Tc 99m Pentetate: diagnostic use; Technetium Tc 99m Pentetate: pharmacokinetics; Tomography, Emission-Computed

RN: CAS Registry Number

0 (Fluorine Radioisotopes); 154-17-6 (Deoxyglucose); 63503-12-8 (Fludeoxyglucose F 18); 65454-61-7 (Technetium Tc 99m Pentetate)

LR: Last Revision Date

20001218

UD: Update

20020109

RO: Record Owner

National Library of Medicine  
SF: Subfile  
Index Medicus  
AN: Accession Number  
8634485

**TI: Clinical application of fluorine-18 FDG-PET to the patients with brain death.**

AU: Momose-Toshimitsu {a}; Nishikawa-Junichi {a}; Watanabe-Toshiaki {a}; Ohtake-Tohru {a}; Sasaki-Yasuhito {a}; Sasaki-Masaru; Mii-Kohji

AD: {a} Dep. Radiol., Dep. ICU, Fac. Med., Univ Tokyo

SO: Japanese-Journal-of-Nuclear-Medicine. 1992; 29 (9) 1139-1142.

PY: 1992

DT: Article-

LA: Japanese; Non-English

LS: Japanese; English

AB: In order to evaluate glucose metabolism in brain death, 18F-FDG-PET scans were performed in three patients with clinically highly suspected brain death. One case was caused by head trauma and the the other two cases were by subarachnoid hemorrhage. All of them were in deep coma without spontaneous breathing, whose intracranial pressure was remarkably elevated up to the level of mean arterial pressure. Nineteen frames of dynamic scan were started soon after intravenous injection of 18F-FDG for one minute per frame, followed by 10 minutes of static scan which started 40 minutes after the injection. Both in dynamic and static scan, no significant intracranial accumulation of 18F-FDG was seen in all of three cases. This finding can be interpreted as the evidence that there is no significant glucose utilization from blood in the brain. This is the first report of clinical application of 18F-FDG-PET brain death. Our results support the clinical dignosis of brain death and 18F-F!

DG-PET can be of value for the assessment of glucose metabolism in patients with suspected brain death.

AI: Y

MC: Cardiovascular-Medicine (Human-Medicine, Medical-Sciences); Metabolism-; Nervous-System (Neural-Coordination); Neurology- (Human-Medicine, Medical-Sciences); Pathology-; Pharmacology-; Radiation-Biology; Radiology- (Medical-Sciences)

ST: Hominidae-; Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-)

TN: animals-; chordates-; humans-; mammals-; primates-; vertebrates-

CB: FLUORINE-18; GLUCOSERN:

13981-56-1: FLUORINE-18; 50-99-7: GLUCOSE

MI: DIAGNOSTIC-DRUG; FLUORINE-18-2=FLUORO-2-DEOXYGLUCOSE;  
GLUCOSE-METABOLISM; HEAD-TRAUMA; POSITRON-EMISSIONTOMOGRAPHY;  
RADIOTRACER-UPTAKE; SUBARACHNOID-HEMORRHAGE

AN: 199395054574

**Brain death: the evaluation of semi-quantitative parameters and other signs in HMPAO scintigraphy.**

AU: Author

Mrhac L; Zakko S; Parikh Y

AF: Author Affiliation

Department of Nuclear Medicine, Dubai Hospital, United Arab Emirates.

SO: Source

Nuclear medicine communications, 1995 Dec, 16(12):1016-20

IS: ISSN

0143-3636

AB: Abstract

The aim of this study was to facilitate the diagnosis of brain death based on semi-quantitative parameters as well as the other scintigraphic signs and symptoms of brain death. Altogether, 72 studies were performed in 54 patients (35 males, 19 females) to evaluate the diagnoses of brain death which were confirmed in 49 cases. Perfusion dynamic acquisition and static imaging were performed after the intravenous injection of 700-900 MBq <sup>99</sup>Tcm-hexamethylpropyleneamine oxime (HMPAO). We reviewed the following parameters retrospectively: (1) qualitative visual assessment of the presence or absence of delayed HMPAO deposition in the brain area; (2) qualitative visual assessment of a 'three-pronged fork' of the cerebral arteries during the first-pass study; (3) any evidence of 'hollow skull' during the first-pass study; (4) any evidence of 'hot nose'; (5) blood flow index (i.e. the ratio of the area under the brain time-activity curve vs that under the curve for the carotid arteries); and (6) delayed uptake index (i.e. the ratio of HMPAO deposition in the brain vs that in the facial regions of interest). We were able to demonstrate the validity of individual signs and symptoms and to confirm the highly reliable nature of semi-quantitative scintigraphic parameters.

LA: Language

English

PY: Publication Year

1995

PT: Publication Type

Clinical Trial; Journal Article

CP: Country of Publication

ENGLAND

DE: Descriptors

Adolescence; Adult; Aged; Brain Death: physiopathology; Brain Death: radionuclide imaging; Case Report; Cerebrovascular Circulation; Child; Child, Preschool; Female; Human; Infant; Male; Middle Age; Organotechnetium Compounds: administration & dosage; Organotechnetium Compounds: diagnostic use; Oximes: administration & dosage; Oximes: diagnostic use; Reproducibility of Results; Retrospective Studies; Technetium Tc 99m Exametazime; Time Factors

RN: CAS Registry Number

0 (Organotechnetium Compounds); 0 (Oximes); 100504-35-6 (Technetium Tc 99m Exametazime)

LR: Last Revision Date

20001218

UD: Update

20020109

RO: Record Owner  
National Library of Medicine  
SF: Subfile  
Index Medicus  
AN: Accession Number  
8719982

**TI: RESULTS OF FOUR TECHNICAL INVESTIGATIONS IN FIFTY CLINICALLY BRAIN DEAD PATIENTS.**

AU: NAU-R {a}; PRANGE-H-W; KLINGELHOEFER-J; KUKOWSKI-B; SANDERD; TCHORSCH-R; RITTMAYER-K

AD: {a} DEP NEUROL, UNIV GOETTINGEN, ROBERT-KOCH-STR 40, W-3400 GOETTIGEN, GER

SO: Intensive-Care-Medicine. 1992; 18 (2): 82-88.

PY: 1992

DT: Article-

IS: 0342-4642

LA: ENGLISH

AB: Fifty consecutive patients (aged 19-77 years, median 56 years) with primary cerebral diseases and the clinical signs of absent cortical and brainstem function were subjected to electroencephalography (EEG), brainstem acoustic evoked potentials (BAEP), extracranial Doppler ultrasonography (ECD) and arterial digital subtraction angiography (DSA). In the majority of cases the results of the technical tests agreed with the clinical signs and were suggestive of brain deaths. However, in one patients EEG revealed clear bioelectrical activity. In 6 cases, doubts existed about whether the EEG was isoelectric; in 3 of the 6 cases biological activity might have been present. In 31 of 42 patients ECD showed a typical pattern. In 31 of 42 patients ECD showed a typical pattern of intracranial circulatory arrest, in 9 of 42 ECD revealed a pattern suggestive of the cessation of cerebral blood flow. In four patients BAEP recordings compatible with brain death were recorded 2 - 3 days before intracranial circulatory arrest. In 2 patients with isoelectric EEG and absent BAEP arterial DSA demonstrated residual perfusion. The findings are discussed in view of the conceptional differences concerning brain death. It is concluded that the strict application of the concept of death of the whole brain requires angiographic demonstration of absent intracerebral blood flow.

AI: Y

ST: Hominidae-; Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

MI: HUMAN CEREBRAL DISEASE CEREBRAL BLOOD FLOW CESSATION ELECTROENCEPHALOGRAPHY

BRAINSTEM ACOUSTIC EVOKED POTENTIALS DOPPLER

ULTRASONOGRAPHY DIGITAL

SUBTRACTION ANGIOGRAPHY DIAGNOSTIC METHOD

MJCC: CC20506 (Nervous-System-Pathology)

CC06504 (Radiation-Radiation-and -Isotope-Techniques)

CC11106 (Anatomy-and-Histology-General-and -Comparative-Radiologic-Anatomy)

CC12504 (Pathology-General-and -Miscellaneous-Diagnostic)

CC12510 (Pathology-General-and-Miscellaneous -Necrosis)

CC14508 (Cardiovascular-System-Blood-Vessel -Pathology)

CC20501 (Nervous-System-General-Methods)

MNCC: CC01012 (Methods-Materials-and-Apparatus-General-Photography) CC10504

(Biophysics-General-Biophysical-Techniques)

CC15002 (Blood-Blood-Forming)

-Organs-and-Body-Fluids-Blood-and-Lymph-Studies)  
BC: BC86215 Hominidae  
AN: 199294053472  
UD: 1992

**TI: Could heart rate variability analysis become an early predictor of imminent brain death? A pilot study.**

AU: Rapenne-Thierry; Moreau-Daniel; Lenfant-Francois; Boggio-Vincent; Cottin-Yves; Freysz-Marc {a}

AD: {a} Departement d'Anesthesie-Reanimation, Hopital General, 3, rue du Faubourg Raines, 21033, Dijon Cedex, France

SO: Anesthesia-and-Analgesia. [print] August, 2000; 91 (2): 329-336.

PY: 2000

DT: Article-

IS: 0003-2999

LA: English

LS: English

AB: Physiology of brain death is characterized by major disturbances of autonomic nervous system (ANS) activity which can lead to graft dysfunction. These findings exhibit the importance of early diagnosis of brain death to improve transplantation outcome. The aim of this prospective study was to assess whether heart rate variability (HRV) analysis, a noninvasive method to investigate ANS activity in comatose patients, could achieve this goal. A total of 14 brain-injured patients were included in the study as soon as they exhibited the clinical signs of imminent brain death. The electrocardiogram was then recorded from two leads with a Holter digital monitor. The clinical diagnosis of brain death was considered after an autonomic storm had occurred. HRV was assessed from 6 h before to 6 h after brain death in both time domain and spectral analysis, estimating either global ANS activity (index of variability, total power), parasympathetic activity (percentage of delta of R-R interval >50 ms, root mean square for successive interval differences, LnHF) or sympathetic activity (LnLF). Hourly averages of these variables were compared by using one-way analysis of variance. To assess whether HRV could per se diagnose brain death, receiver operating characteristic curves were generated for total power, root mean square for successive interval differences, and LnHF. We observed, for 6 h before brain death, a progressive extinction of the influence of the ANS on cardiovascular regulation. There was no activity in the two components of the ANS as soon as brain death occurred. HRV analysis appeared to be a very sensitive but a less specific method of diagnosing brain death.

interval >50 ms, root mean square for successive interval differences, LnHF) or sympathetic activity (LnLF). Hourly averages of these variables were compared by using one-way analysis of variance. To assess whether HRV could per se diagnose brain death, receiver operating characteristic curves were generated for total power, root mean square for successive interval differences, and LnHF. We observed, for 6 h before brain death, a progressive extinction of the influence of the ANS on cardiovascular regulation. There was no activity in the two components of the ANS as soon as brain death occurred. HRV analysis appeared to be a very sensitive but a less specific method of diagnosing brain death.

AI: Y

MC: Cardiovascular-Medicine (Human-Medicine, Medical-Sciences); Neurology- (Human-Medicine, Medical-Sciences)

ST: Hominidae-: Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-): patient-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

PS: autonomic-nervous-system: nervous-system; brain-: nervous-system; heart-: circulatory-system

DS: brain-death: nervous-system-disease; coma-: nervous-system-disease

MQ: Holter-digital-monitor: medical-equipment; heart-transplantation: surgical-method, therapeutic-method

MI: heart-rate-variability: prognostic-marker

ALT: Brain-Death-(MeSH); Coma-(MeSH)

AN: 200000294781

UD: 20001003

**TI: Increased serum S100beta protein concentrations following severe head injury in humans: A biochemical marker of brain death?**

AU: Regner-Andrea {a}; Kaufman-Mauro; Friedman-Gilberto; Chemale-Ivan

AD: {a} Rua Santa Terezinha 291-401, Porto Alegre, RS, Brazil

SO: Neuroreport-. [print] 26 March, 2001; 12 (4): 691-694.

PY: 2001

DT: Article-

IS: 0959-4965

LA: English

LS: English

AB: This study investigated S100beta protein as a biochemical serum marker of brain damage in severe head injury and brain death victims. Blood samples obtained from 15 patients with severe head injury admitted to the trauma intensive care unit (ICU), five patients with a diagnosis of brain death due to hemorrhage following cerebral aneurysm rupture, and five healthy individuals were investigated. The S100beta protein serum concentrations were analyzed with a immunoradiometric assay kit. The 15 patients with severe head injury were followed up for 6 months. Outcome was considered either death or recovery with ICU discharge. S100beta concentrations were closely related to brain damage. Among the severe head injury victims, higher S100beta concentrations were detected in those patients that progressed to death. The individuals with brain death had similar mean S100beta concentrations, irrespective of its cause (either trauma or vascular rupture). S100beta protein is a promising!

serum outcome predictor for severe head injury victims and may contribute to the early diagnosis of brain death.

AI: Y

MC: Clinical-Chemistry (Allied-Medical-Sciences); Neurology- (Human-Medicine, Medical-Sciences)

ST: Hominidae-: Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-): patient-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

CB: S100-beta-protein: brain-damage-marker, serum-level

DS: cerebral-aneurysm-rupture: nervous-system-disease, vascular-disease; severe-headinjury: injury-, outcome-predictors

MI: brain-death

ALT: Head-Injuries-(MeSH)

AN: 200100153591

UD: 20010430

**TI: DETERMINATION OF CEREBRAL PERFUSION BY MEANS OF PLANAR  
BRAIN SCINTIGRAPHY**

AND TECHNETIUM-99M HMPAO IN BRAIN DEATH PERSISTENT  
VEGETATIVE STATE AND  
SEVERE COMA.

AU: SCHLAKE-H-P {a}; BOETTGER-I-G; GROTEMEYER-K-H; HUSSTEDT-I-W;  
BRANDAU-W;  
SCHOBER-O

AD: {a} UNIV WUERBURG, DEP NEUROSURGERY, JOSEF-SCHNEIDERSTRASSE  
11, W-8700  
WUERZBURG, GER

SO: Intensive-Care-Medicine. 1992; 18 (2): 76-81.

PY: 1992

DT: Article-

IS: 0342-4642

LA: ENGLISH

AB: A total of 24 patients with clinical evidence of brain death (n = 17), severe coma (n = 2; GCS .apprxeq. 3) and apallic syndrome (n = 4) underwent a comparative investigation with 99mTc-HMPAO brain scintigraphy, EEG, auditory and somatosensory evoked potentials. Accompanied by EEG and evoked potentials, brain scintigraphy enabled confirmation of cerebral death in 15/17 patients. In one case clinical examination and evoked potentials suggest brain death, but cerebral perfusion and EEG were normal ("brain stem death"). One patient with evidenced of cerebral death in clinical examination, brain scintigraphy and evoked potentials, showed questionable focal EEG activity; however, autopsy revealed intravital autolysis of the entire brain. All patients with apallic syndrome and deep coma showed a distinct cerebral perfusion, but gross EEG abnormalities; evoked potentials were delayed or absent. Planar scintigraphy with 99mTc-HMPAO appears to be superior to neurophysiological techniques discriminating patients with agonal cerebral dysfunction from those with brain death.

AI: Y

ST: Hominidae-; Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

MI: HUMAN HEXAMETHYLPROPYLENAMINE OXIME DIAGNOSTIC-DRUG  
CEREBRAL DYSFUNCTION

ELECTROENCEPHALOGRAPHY

MJCC: CC20506 (Nervous-System-Pathology)

CC06504 (Radiation-Radiation-and  
-Isotope-Techniques)

CC11106 (Anatomy-and-Histology-General-and  
-Comparative-Radiologic-Anatomy)

CC12510 (Pathology-General-and  
-Miscellaneous-Necrosis)

CC22005 (Pharmacology-Clinical  
-Pharmacology)

CC22024 (Pharmacology-Neuropharmacology)

MNCC: CC01012 (Methods-Materials-and-Apparatus-General-Photography)  
CC10060

(Biochemical-Studies-General)

BC: BC86215 Hominidae

AN: 199294053471

UD: 1992

**TI: N18 in median somatosensory evoked potentials: A new indicator of medullary function useful for the diagnosis of brain death.**

AU: Sonoo-Masahiro {a}; Tsai-Shozawa-Yasunobu; Aoki-Makoto; Nakatani-Toshio; Hatanaka-Yuuki; Mochizuki-Atsuko; Sawada-Mikio; Kobayashi-Kunio; Shimizu-Teruo  
AD: {a} Department of Neurology, Teikyo University School of Medicine, Kaga 2-11-1 Itabashi-ku, Tokyo, 173, Japan  
SO: Journal-of-Neurology-Neurosurgery-and-Psychiatry. Sept., 1999; 67 (3): 374-378.  
PY: 1999

DT: Article-  
IS: 0022-3050

LA: English  
LS: English

AB: Objectives-To record N18 in median somatosensory evoked potentials (SEPs) for deeply comatose or brain dead patients and to demonstrate the usefulness of N18 for the diagnosis of brain death in comparison with auditory brain stem responses (ABRs) and P13/14 in median SEPs, which have been conventionally used as complementary tests for the diagnosis of brain death. Methods-Subjects were 19 deeply comatose or brain dead patients. Thirteen recordings were performed in deeply comatose but not brain dead conditions, and 12 recordings were performed in brain death. N18 was evaluated in the CPi-C2S lead (or other scalp-C2S leads) to obtain a flat baseline. Results-N18 was preserved in 12 of 13 non-brain dead comatose recordings whereas it was completely lost for all of the 12 brain death recordings. P13/14 in median SEPs was preserved for all the comatose recordings, whereas apparent P13/14-like potentials, usually of low amplitude, were seen in nine of 12 brain death recordings!

-that is, frequent false positives. The ABRs already showed features which were characteristic for brain death (loss of components other than wave 1 or small wave 2) for four comatose recordings, in three of which N18 was preserved. The last result not only corresponds with the fact that ABRs can evaluate pontine and midbrain functions and not medullary function, but further supports the medullary origin of N18. In the four patients followed up for the course of progression from coma to brain death, N18s preserved in normal size during the comatose state were completely lost after brain death was established. Conclusions-The N18 potential is generated by the cuneate nucleus in the medulla oblongata in the preceding studies. N18 is suggested to be a promising tool for the diagnosis of brain death because there were no false positives and rare false negatives in the present series for detecting the remaining brain stem function.

AI: Y

MC: Neurology- (Human-Medicine, Medical-Sciences)

ST: Hominidae-: Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-): adult-, aged-, female-, middle-age, patient-, male-

TN: Animals-; Chordates-; Humans-; Mammals-; Primates-; Vertebrates-

PS: medulla-oblongata: cuneate-nucleus, nervous-system

MI: auditory-brainstem-response; brain-death: diagnosis-; median-somatosensoryevoked-potentials: N18-

AN: 199900286126

**TI: Direct comparison of Tc-99m DTPA and Tc-99m HMPAO for evaluating brain death.**

AU: Spieth-Michael-E {a}; Ansari-Azizullah-N; Kawada-Tom-K; Kimura-Robyn-L; Siegel-Michael-E

AD: {a} Dep. Radiol., King/Drew Med. Cent., 12021 South Wilmington Way, Los Angeles, CA 90059, USA

SO: Clinical-Nuclear-Medicine. 1994; 19 (10) 867-872.

PY: 1994

DT: Article-

IS: 0363-9762

LA: English

AB: Portable cerebral perfusion studies provide a quick and accurate alternative to traditional confirmatory examinations (such as four-vessel angiography and electroencephalography) to determine brain death. The authors retrospectively analyzed 26 cerebral perfusion studies using both Tc-99m DTPA and Tc-99m HMPAO. The flow agents gave identical results. Additionally, the delayed-phase Tc-99m HMPAO images gave the same results for brain death (14 positive and 12 negative) as the flow images from either agent. Because the Tc-99m HMPAO delayed images can be used for diagnosis, many technical problems become less crucial. Unlike Tc-99m DTPA, Tc-99m HMPAO normally visualizes the gray matter of the cerebellum, midbrain, and medulla. These areas must be evaluated to ensure that they meet the strict criteria for brain death. These differences and the present study suggest that Tc-99m HMPAO is a superior agent for cerebral perfusion studies to determine brain death.

AI: Y

MC: Neurology- (Human-Medicine, Medical-Sciences); Pathology-; Pharmacology-

ST: Hominidae-: Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-)

TN: animals-; chordates-; humans-; mammals-; primates-; vertebrates-

CB: TECHNETIUM-99M-DIETHYLENETRIAMINE-PENTAACETIC-ACID;

TECHNETIUM-99M

RN: 77319-47-2: TECHNETIUM-99M DIETHYLENETRIAMINE PENTAACETIC ACID; 14133-76-7: TECHNETIUM-99M

MI: CEREBRAL-PERFUSION; DIAGNOSTIC-DRUG; TECHNETIUM-99MDIETHYLENETRIAMINE-

PENTAACETIC-ACID; TECHNETIUM-99MHEXAMETHYLPROPYLENEAMINE-OXIME

AN: 199497548606

**[99mTc-HMPAO SPECT in the brain death--a case report]**

AU: Author

Tsuchida T; Sadato N; Nishizawa S; Matoba N; Fujita T; Tamaki N; Konishi J; Tamai S; Shingu K; Yonekura Y

AF: Author Affiliation

Department of Radiology and Nuclear Medicine, Kyoto University Faculty of Medicine.

SO: Source

Kaku igaku. The Japanese journal of nuclear medicine, 1993 Jun, 30(6):663-7

IS: ISSN

0022-7854

AB: Abstract

Brain single photon emission computed tomography (SPECT) with 99mTc-d,l-hexamethyl-propyleneamine oxime (HMPAO) was performed twice in a 78-year-old man clinically diagnosed as brain death according to the standard criteria of the Japanese Ministry of Welfare. The first brain SPECT demonstrated the tracer accumulation in the brain, indicating preserved cerebral blood flow. The second brain SPECT performed 3 days later revealed cessation of the blood flow. In patients with preserved cerebral blood flow, the diagnosis of brain death cannot be made, even if they meet the existing criteria, because previous report noted the recovery in some of those patients. Brain perfusion SPECT plays an important role as a confirmatory test for the diagnosis of the brain death.

LA: Language

Japanese

PY: Publication Year

1993

PT: Publication Type

Journal Article

CP: Country of Publication

JAPAN

DE: Descriptors

Aged; Brain Death: physiopathology; Brain Death: radionuclide imaging; Case Report; Cerebrovascular Circulation; English Abstract; Human; Male; Organotechnetium Compounds: diagnostic use; Oximes: diagnostic use; Technetium Tc 99m Exametazime; Tomography, Emission-Computed, Single-Photon

RN: CAS Registry Number

0 (Organotechnetium Compounds); 0 (Oximes); 100504-35-6 (Technetium Tc 99m Exametazime)

LR: Last Revision Date

20001218

UD: Update

20020109

RO: Record Owner

National Library of Medicine

SF: Subfile

Index Medicus

AN: Accession Number

8345696

**TI: Considerations of brain death on a SPECT cerebral perfusion study.**

AU: Valle-Guido {a}; Ciritella-Pierluigi; Giuliano-Bonetti-Massimo; Dicembrino-Franca; Perrone-Elio; Piero-Perna-Gian

AD: {a} Via Ignazio Guidi 18, 00147 Roma, Italy

SO: Clinical-Nuclear-Medicine. 1993; 18 (11) 953-954.

PY: 1993

DT: Article-

IS: 0363-9762

LA: English

AB: Brain death imaging is often a diagnostic challenge. Cerebral scintigraphy is extensively used for this analysis, but this test does not allow the perfusion evaluation of the posterior fossa. The authors report a case in which a SPECT study showed persistence of blood flow in infratentorial structures with total absence of cerebral (supratentorial) perfusion. This finding excluded the diagnosis of brain death.

AI: Y

MC: Morphology-; Nervous-System (Neural-Coordination); Neurology- (Human-Medicine, Medical-Sciences); Pathology-; Radiology- (Medical-Sciences)

ST: Hominidae-; Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-)

TN: animals-; chordates-; humans-; mammals-; primates-; vertebrates-

MI: CASE-REPORT; CASE-STUDY; DIAGNOSTIC-METHOD; PATHOLOGY-; SINGLE-PHOTON-EMISSION-COMPUTED-TOMOGRAPHY

AN: 199497078058

**TI: Influence of the intra-aortic balloon pump on the transcranial Doppler flow pattern in a brain-dead patient.**

AU: Van-Der-Naalt-J {a}; Baker-A-J

AD: {a} Dep. Neurol., Univ. Hosp. Groningen, PO Box 30.001, 9700 RB Groningen, Netherlands

SO: Stroke-. 1996; 27 (1) 140-142.

PY: 1996

DT: Article-

IS: 0039-2499

LA: English

AB: Background: Confirmation of clinical brain death with transcranial Doppler (TCD) has been described. With the introduction of mechanical assist devices, it is important to know how these devices influence TCD measurements. Case Description: A patient who fulfilled the clinical criteria for brain death after cardiac arrest is described. An intraaortic balloon pump (IABP) was necessary to maintain hemodynamic stability. A TCD examination was performed as an adjunct to the clinical diagnosis of brain death. A pattern of reversal of blood velocity typical of brain death was observed. With the IABP functioning, an increase of mean forward flow velocity without appreciable increase in the net flow velocities was seen. The results of the TCD measurements with the IABP functioning are not in concordance with values reported in the literature that confirm the clinical diagnosis of brain death. Conclusions: Application of TCD in a patient with an IABP could lead to false interpret!

ation of results if the TCD mean velocities are not registered with the IABP on standby or if the net flow velocities are not calculated.

AI: Y

MC: Cardiovascular-Medicine (Human-Medicine, Medical-Sciences); Cardiovascular-System (Transport-and-Circulation); General-Life-Studies; Neurology- (Human-Medicine, Medical-Sciences); Pathology-

ST: Hominidae-: Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-)

TN: animals-; chordates-; humans-; mammals-; primates-; vertebrates-

MI: BLOOD-VELOCITY; CARDIAC-ARREST; CASE-STUDY; DIAGNOSIS-; HEMODYNAMIC-STABILITY

AN: 199698652306

**TI: Diagnosis of cerebral circulatory arrest with Doppler sonography. Results of an inquiry.**

AU: von-Reutern-G-M {a}

AD: {a} Askelepios Neurologische Klinik Bad Salzhausen, Am Hasensprung 6, D-63667 Nidda, Germany

SO: Nervenarzt-. June, 1998; 69 (6) 525-529.

PY: 1998

DT: Article-

IS: 0028-2804

LA: German; Non-English

LS: German; English

AB: In 1991 the diagnosis of cerebral circulatory arrest with Doppler sonography was accepted by the Medical Council of the Bundesaerztekammer as one of the methods able to shorten the waiting time for fulfilling the criteria for diagnosis of cerebral death. A survey was undertaken to determine how frequently Doppler sonography has been used since that time in certifying brain death. A total of 400 questionnaires were sent out to all neurological (272) and neurosurgical (128) departments in Germany. In all, 226 questionnaires were returned. In 71 departments, Doppler sonography has been used to certify brain death, mostly combined with other methods. The question of whether false positive results have been observed was answered five times in the affirmative. The background to these cases was clarified by telephone calls. In order to indicate pitfalls, the examiners reported borderline situations which in part did not fulfil the prerequisites. In none of these cases had the !

diagnosis of brain death been based on ultrasound data. Doppler sonography for the diagnosis of cerebral circulatory arrest has been used by a considerable number of neurological and neurosurgical departments in Germany as an additional confirmatory test and rather seldom as the only method to shorten the waiting period.

AI: Y

MC: Neurology- (Human-Medicine, Medical-Sciences); Radiology- (Medical-Sciences)

GE: Germany- (Europe-, Palearctic-region)

DS: cerebral-circulatory-arrest: diagnosis-, nervous-system-disease, vascular-disease

MQ: questionnaire-: data-collection-method; Doppler-sonography: diagnostic-method, efficacy-, reliability-

MI: Medical-Council-of-the-Bundesaerztekammer

AN: 199800350226

UD: 19980629

**TI: Scalp, earlobe and nasopharyngeal recordings of the median nerve somatosensory evoked P14 potential in coma and brain death: Detailed latency and amplitude analysis in 181 patients.**

AU: Wagner-Wolfgang

AD: Neurochirurgische Universitaetsklinik, Fleischmannstrasse 8, D-17487 Greifswald, Germany

SO: Brain-. 1996; 119 (5) 1507-1521.

PY: 1996

DT: Research-Article

IS: 0006-8950

LA: English

AB: Median nerve somatosensory evoked potentials (SEPs) were recorded in a total of 181 patients in coma and brain death. Special attention was paid to the derivation of P14 (the positive potential occurring approx 14 ms after median nerve stimulation) with different electrode montages, using midfrontal scalp (Fz), linked earlobe (A-1/2), median nasopharyngeal (Pgz) and non-cephalic reference (NC) electrodes. The P14 amplitude (and, to a lesser extent, latency) were invariably lower in brain death than in coma. The potential was preserved in coma in all patients, but lost in brain death in 9.8% in Fz-NC and Pgz-NC recordings, in 23.2% in Fz-A-1/2, and in 100% in Fz-Pgz. Thus, Fz-Pgz was the derivation yielding the most reliable results with respect to the distinction between coma and brain death and is therefore recommended as a confirmatory test, when other diseases interrupting the lemniscal pathway (isolated brainstem death, high cervical transverse cord lesion and focal bilateral lemniscal lesion) are excluded. Theoretical considerations lead to the hypothesis of different (rostral and caudal) segments of the P14 generator dipole being recorded by the different electrode montages. It is assumed that Fz-Pgz picks up the most rostral part of P14 (rP14) that is invariably lost in brain death and preserved in coma.

AI: Y

MC: Membranes- (Cell-Biology); Neurology- (Human-Medicine, Medical-Sciences); Pathology-

ST: Hominidae-; Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-)

TN: animals-; chordates-; humans-; mammals-; primates-; vertebrates-

MI: BRAIN-DEATH; COMA-; DIAGNOSTIC-METHOD; ELECTRODELOCATION; LEMNISCAL

-PATHWAY; LINKED-EARLOBE; MEDIAN-NASOPHARYNGEAL;

MIDFRONTAL-SCALP; NERVOUS

-SYSTEM-DISEASE; NEUROLOGY-; NON-CEPHALIC-REFERENCE; PATIENT-;

P14-FAR

-FIELD-POTENTIAL-AMPLITUDE; P14-FAR-FIELD-POTENTIAL-LATENCY;

SOMATOSENSORY

-EVOKED-POTENTIAL-RECORDING

AN: 199799322312

**TI: Study or primary ischemic brain death with transcranial Doppler ultrasonography.**

AU: Zhang-Zhiyi-Et@al

AD: Hosp. Cardio-cerebrovasc. Acad. Heilongjiang Province, Harbin 150018, China

SO: Zhongguo-Chaosheng-Yixue-Zazhi. 1996; 12 (8) 43-44.

PY: 1996

DT: Article-

IS: 1002-0101

LA: Chinese; Non-English

LS: Chinese; English

AB: Three hypertension patients with cerebral thrombosis and/or cerebral embolism were examined by TCD. The average velocity of middle cerebral artery was 6-16 cm/s. During diastole, the waveform disappeared in TCD or the signals became much short. All of these features were different from the patients with hypertension or ischemic cerebro sclerosis ordinarily observed. All the patients passed away eventually. The special waveforms could be used as additional signs of primary brain death supplementary to the diagnostic standards of Kirkham.

AI: Y

MC: Cardiovascular-Medicine (Human-Medicine, Medical-Sciences); Cardiovascular-System (Transport-and-Circulation); Hematology- (Human-Medicine, Medical-Sciences); Methods-and-Techniques; Nervous-System (Neural-Coordination); Neurology- (Human-Medicine, Medical-Sciences); Pathology-; Radiology- (Medical-Sciences)

ST: Hominidae-; Primates-, Mammalia-, Vertebrata-, Chordata-, Animalia-

OR: human- (Hominidae-)

TN: animals-; chordates-; humans-; mammals-; primates-; vertebrates-

MI: CASE-STUDY; CEREBRAL-EMBOLISM; CEREBRAL-THROMBOSIS;

DIAGNOSTIC-METHOD; HYPERTENSION-; ISCHEMIC-CEREBROSCLEROSIS

AN: 199699156026

