



Letter to the Editor

Conscious mental activity during a deep hypothermic cardiocirculatory arrest?

Sir,

During the last decade, prospective studies conducted in the Netherlands, United Kingdom, and United States have revealed that approximately 15% of cardiac arrest survivors report conscious mental activity while their hearts are stopped.^{1–4} This finding is quite intriguing considering that during cardiac arrest, the flow of blood to the brain is interrupted. When this happens, the brain's electrical activity (as measured with electroencephalography [EEG]) disappears after 10–20 s,⁵ and the patient is deeply comatose. As a consequence, patients who have a cardiac arrest are not expected to have clear and lucid mental experiences that will be remembered.

We recently conducted a retrospective study in patients who underwent deep hypothermic cardiocirculatory arrest (DHCA) at Hôpital Sacré-Coeur (a research hospital affiliated with the Université de Montréal) between 2005 and 2010. This surgical procedure was employed in these patients to repair aortic defects. The main objective of the study was to estimate the prevalence of conscious mental events during DHCA. A total of 33 patients returned completed questionnaires (70 were sent). Three patients (9%) reported conscious mental activity. The three patients were interviewed following the receipt of the completed questionnaires.

The case of one patient is particularly worth reporting. This patient, J.S., was 31 weeks pregnant when, on October 26, 2008, she woke up feeling short of breath and weak (J.S. was then 31-year-old). She was transported to Hôpital Sacré-Coeur by ambulance. Using transoesophageal echocardiography, physicians found out that she was suffering from an ascending aortic dissection.

J.S. first underwent an emergency caesarean section. After having successfully delivered a baby boy, she was then transferred to a surgery room to undergo the replacement of the ascending aorta. She did not see or talk to the members of the surgical team, and it was not possible for her to see the machines behind the head section of the operating table, as she was wheeled into the operating room. J.S. was given general anesthesia and her eyes were taped shut.

At one point during surgery, J.S. claims to have had an out-of-body experience (OBE). From a vantage point outside her physical body, she apparently “saw” a nurse passing surgical instruments to the cardiothoracic surgeon. She also perceived anesthesia and echography machines located behind her head. We were able to verify that the descriptions she provided of the nurse and the machines were accurate (this was confirmed by the cardiothoracic surgeon who operated upon her). Furthermore, in the OBE state J.S. reported feelings of peace and joy, and seeing a bright light.

Reports of independently corroborated veridical OBE perception during cardiac arrest have previously been published (for instance,

see¹). Here it cannot be determined with certainty whether the subjective experience reported by J.S. occurred precisely during the cardiocirculatory arrest (which lasted for 15 min). Nonetheless, the tantalizing case of J.S. raises a number of perplexing questions. For this reason, we hope that it will stimulate further research with regard to the possibility of conscious mental activity during cardiocirculatory arrest.

Conflict of interest statement

No conflicts of interest to declare.

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References

1. Van Lommel P, Wees Van R, Meyers V, et al. Near death experience in survivors of cardiac arrest: a prospective study in the Netherlands. *Lancet* 2001;358:2039–45.
2. Parnia S, Waller D, Yeates R, et al. A qualitative and quantitative study of the incidence, features and aetiology of near death experiences in cardiac arrest survivors. *Resuscitation* 2001;48:149–56.
3. Schwaning J, Eisenberg PR, Schechtman KB, et al. A prospective analysis of near death experiences in cardiac arrest patients. *J Near-Death Stud* 2002;20:215–32.
4. Greyson. Incidence and correlates of Near Death Experiences in a cardiac care unit. *Gen Hosp Psychiatry* 2003;25:269–76.
5. Clute HL, Levy WJ. Electroencephalographic changes during brief cardiac arrest in humans. *Anesthesiology* 1990;73:821–5.

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