

Patient awakes from post-traumatic minimally conscious state after administration of depressant drug

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A patient who had suffered a traumatic brain injury unexpectedly recovered full consciousness after the administration of midazolam, a mild depressant drug of the GABA A agonists family. This resulted in the first recorded case of an "awakening" from a minimally-conscious state (MCS) using this therapy. Although similar awakenings have been reported using other drugs, this dramatic result was unanticipated. It is reported in *Restorative Neurology and Neuroscience*.

Traumatic brain injuries occur at high rates all over the world, estimated at 150-250 cases per 100,000 population per year. These injuries can result in several outcomes, ranging from vegetative state, minimally conscious state, severe disability to full recovery. In most cases, the outcome will cause catastrophic changes for his/her family and a significant drain on both human and financial resources.

Two years after the injury caused by a [motor vehicle accident](#), the patient was mildly sedated, in order to undergo a CT scan, using midazolam instead of the more commonly used propofol. As the authors described in the article, the patient began to interact with the anesthetist and soon after with his parents. He talked by cellphone with his aunt and congratulated his brother when he was informed of his graduation; he recognized the road leading to his home. When he was asked about his car accident, he did not remember anything and apparently he was not aware of his condition. This clinical status lasted about two hours after

drug [administration](#) and disappeared quickly thereafter, taking the patient back to the previous condition.

To further investigate this phenomenon, the researchers collected extensive EEG scans before, during, and after administration of midazolam. Using sophisticated data analysis, they were able to show the locations within the brain where the drug induced changes and followed the onset and the decline of the effects.

They noted that the patient could have also been diagnosed with the classic symptoms of catatonia, based on the similarity of the EEG sometimes observed in that pathology. Catatonia can be a manifestation of a non-convulsive status epilepticus (NCSE). The authors were thus faced with a two-fold mystery: Is this a case of catatonia mimicking a case of MCS or does the MCS, as a syndrome in itself, also include elements of a catatonic nature? Do the relative contributions of MCS versus catatonia in the individual patient determine whether or not he/she will respond to GABA A agonist drugs?

Maria Chiara Carboncini, MD, Medical Director of the Brain Injury Unit, Department of Neuroscience, University Hospital of Pisa and Adjunct Professor, University of Pisa, Italy, states, "Considering the MCS from this point of view could pave the way to new perspectives for both therapy and clinical management: at least a part of MCS patients could in fact benefit from treatment with non-selective GABA A agonists...." She also notes that as a practical consequence, "such [patients](#) should be tested not only with GABA A selective drugs like zolpidem, but also with GABA A non-selective drugs like benzodiazepines."

More information: "A case of post-traumatic minimally conscious state reversed by midazolam: Clinical aspects and neurophysiological correlates," by Maria Chiara Carboncini, Andrea Piarulli, Alessandra Virgillito, Pieranna Arrighi, Paolo Andre, Francesco Tomaiuolo,

Antonio Frisoli, Massimo Bergamasco, Bruno Rossi and Luca Bonfiglio.
Restorative Neurology and Neuroscience, November 2014, [DOI:
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