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THROUGH CEREBRAL SPINAL FLUID BRAINSTEM STIMULATION FOR VEGETATIVE STATE PATIENTS

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Objective: To work out the method which provides diffuse stimulation of brain stem reticular formation (RF) in vegetative state (VS) patients without additional damage of brainstem and thalamic structures by implanted electrodes.

Methods: Nine patients with VS for more than 3 months were treated by the method of through cerebral spinal fluid brainstem electrical stimulation (TCSFBS) for a period of 1 year. Two monopolar electrodes were implanted for TCSFBS implementation. The first electrode was inserted in the lateral ventricle of spared hemisphere. The second one was implanted in the cistern Magna or epiduraly between low margin of occipital bone and posterior arch of C1 vertebra. Clinical effects, electro-encephalogram (EEG) and auditory brainstem response (ABR) were researched in all patients during TCSFBS therapy.

Results: Such well known markers of RF activation as arousal response (AR) and desynchronization reaction (DR) were detected in all VS patients during TCSFBS. Six out of the 9 cases emerged from VS. Two out of these 6 cases regain consciousness. The other 4 patients were in MCS. The remaining 3 cases failed to emerged from VS.

Conclusion: Efficiency of RF stimulation for VS patients' treatment is shown in researches of class II evidence. Method of deep brain stimulation (DBS) with implantation of bipolar electrode in thalamic or brainstem structures provides RF activation in some VS patients. A part of VS patients do not display signs of RF activation during DBS which may be due to brainstem and thalamic lesion foci which are mandatory for post traumatic VS patients. The TCSFBS can provides activation of RF in VS patients without additional damage of thalamic and brainstem tissue in the trajectory of implanted electrodes

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