

# Neuropsychological Status of Patients Suffering from Ruptured Brain Aneurysms: Are We Missing Something?

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Dear Editor,

Several distinguished journals, including yours have previously disseminated fascinating studies on the neural basis of human cognition and behavior. However, relatively little has been written on impaired neuropsychological function following aneurysmal subarachnoid hemorrhage and its rehabilitation. Therefore, we raise the issue here.

The risk of ruptured brain aneurysms is evaluated by different factors, including aneurysmal size, morphology, patient's age, and sex. Subarachnoid Hemorrhage (SAH) due to ruptured intracranial aneurysms is affecting 6-10 per 100.000 people/annually [1]. SAH's fatality rate is an estimated 20%-30% in the first 48 hours, and a near 50% in the first 30 days [2]. The recovery rate of ruptured brain aneurysms is generally low. In the long-term, more than ¼ of the affected would deteriorate [2,3].

SAH induces neuropsychological deficits through focal and diffuse brain injuries [2]. Common deficits include emotional changes but also, cognitive impairments e.g on memory, language, concentration, planning and logic processing (reasoning) [2,4]. Kreiter et al. introduced predictive factors of cognitive dysfunction after traumatic and non-traumatic SAH [5]. Even though a few causes of impaired neuropsychological status were recognized, there was no suggestion in the literature how the health practitioner would interfere with, to reduce it. According to the European guidelines for the management of ruptured intracranial aneurysms, there is no "gold" timing [6]. Patients with good status at admission, or good World Federation of Neurological surgeons (WFNS) scores, might have benefit of early management, at least within the first 72 hours. Although suggestions have been made, there is no evidence of how timing affects cognition in ruptured brain aneurysms. Moreover, there is also no report on how the neuropsychological status of patients changes during their hospitalization and longer term following discharge. Egeto et al. reports cognitive deficit in long-term follow-up following treatment for ruptured brain aneurysm [7]. According to his study, patients following surgical clipping had worse outcome compared to those who followed clipping on language tests and executive function. Both treatment groups were compared to healthy controls, and both groups appeared to have impaired cognitive functions, in contrast to the healthy controls. An interesting observation was made that higher blood flows such the one of the medial cerebral artery (MCA) and posterior circulation have more differences in the outcome, compared to those who had ruptured aneurysm of the anterior communicating artery (AComA). However, there was no report of how this deficit was established during the recovery time.

Therefore, we are sharing these thoughts with you. Maybe it is time to change how we approach ruptured brain aneurysm and the cognitive status of the patients, or maybe it is time to at least reconsider how we report the used treatment strategies for aneurysmal subarachnoid hemorrhage in regard to the patient neuropsychological condition. We should not be simply treating aneurysms, but instead, we should be treating patients. And patient's quality of life matters.

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