Comments on ‘Hemodynamic Features of Non-Aneurysmal Subarachnoid Hemorrhage in a Case of Familial Moyamoya Disease’ after a 4-Year Transcranial Doppler Ultrasound Follow-Up

Massimiliano Toscano, Edoardo Vicenzini, Vittorio Di Piero
Department of Neurology and Psychiatry, Sapienza University of Rome, Rome, Italy

Dear Sir,

We previously described the case of a 57-year-old woman with familial moyamoya disease who presented with subarachnoid hemorrhage not due to ruptured intracranial aneurysm (NASAH) [1]. The peculiar feature of the described case was that intracranial vessels showed a persisting high flow velocity and low resistance pattern, except for the right MCA, which showed very high flow velocity and normal flow resistive indices in the acute phase, with an unexpected further increase in blood flow velocity and a progressive lowering of resistance indices, in seriated transcranial Doppler examinations. In the light of the absence of clinical and radiological signs of vasospasm, and considering both the excellent outcome of the patient as well as the stability of the observed hemodynamic pattern after 1 month, we advanced the hypothesis that the progressive paradoxical increase in blood flow velocity in our patient represented a post-SAH reversion to a previous abnormal pattern typical of moyamoya collaterals (i.e. high flow velocity and low resistance).

Since no follow-up data are nowadays available on these very rare patients, we are performing a follow-up, now at the 4th year, in order to confirm the aforementioned hypothesis and to address intracranial vessel hemodynamic feature through time, to consider eventual revascularization. Therefore, complete neurological and neurosonological examination have been performed twice a year.

It is noteworthy that no change in the hemodynamic pattern was noted so far, and that the patient is currently asymptomatic during the last 4 years, all intracranial vessel showed stable high flow velocity and low resistive indices observed in the acute phase, reflecting a collateral network pattern frequently described in moyamoya patients [2].

On the other hand, this was not the case of the right MCA: the paradoxical increase in blood flow velocity (along with the progressive lowering of resistance indices), reached a plateau phase after the first year, and has been remaining stable since the last 3 years.

This seems to confirm our hypothesis: in the acute phase, the presence of SAH significantly increased pulsatility indices, probably reflecting a global change in vascular peripheral resistance; consequently, the subsequent lowering of resistive indices until a plateau phase has to be considered a return to a pre-bleeding condition.

Given the negative correlation between increasing flow velocity and decreasing flow resistance found in arteries with constant diameter [3], this also explains the features seen for blood flow velocity after the acute phase: after a lowering in the acute phase (in response to the increased pulsatility indices), the further increase to a plateau actually represents a return to a previous abnormal pattern after the subarachnoid bleeding.

Disclosure Statement

The authors have no conflicts of interest to disclose.

References