

Role of Atmospheric Pressure as a Trigger for Subarachnoid Hemorrhage

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Studies suggest that there is a link between temperature decline from the highest of the previous day (TDP) to the lowest of the event day with the incidence of subarachnoid hemorrhage (SAH).¹ The impact of weather conditions, particularly the atmospheric pressure, on the occurrence of cerebral hemorrhage is well described in the literature. Several studies have reported a potential correlation between environmental factors and SAH onset, while certain others have not found a significant association, resulting in controversy due to different assessment of meteorological factors, patient selection, target geographical area and study design.²⁻⁸ The atmospheric pressure is related to the temperature variation and atmospheric pressure determines nature of temperature fluctuation, magnitude of change and persistence duration. However, using prefecture-wide survey data amassing all patients with SAH in the defined area, has minimized referral and selection biases and proved the correlation of TDP with the incidence of spontaneous SAH. The triggering effect of TDP was prominent in younger women patients <65 years old. Interestingly, variations in barometric pressure are reported to be associated with the development of intracerebral hemorrhages, including SAH. It is possible that the effect depends on the change of magnitude of the barometric pressure, and secondary manifesting, as temperatures changes in preceding days and onset of new-onset SAH ictus. This aspect has been evaluated by various authors.^{5,8-10}

Previous studies from the Netherlands, Japan and Northern France revealed significant associations between low daily temperatures and SAH.^{2,3,11} Conversely, such an association was not found to be significant in studies from Germany and the US.^{4,6} Although the study has many concerns (a small sample size; flack of atmospheric pressure trend over SAH ictus and limited information about exposure to cold, usage of protective clothing and living room modifications),⁷ to add further, investigating environmental factors not only will help to know the impact of atmospheric pressure as a risk factor to trigger SAH but also shall help in deciding how the environment around these patients needs to be managed in critical care settings. The biggest challenge for the researcher would be to identify whether it is low pressure,¹² or high atmospheric pressure,⁵ which is more important. Additionally, it will help to guide how the patients with diagnosed, yet unruptured, aneurysms can be managed and what kind of day-to-day activities in what weather conditions they can participate in.

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