



Sentinel Headache as a Prodrome of Aneurysmal Rupture: a Systematic Review

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Introduction

The Sentinel Headache (SH) is a secondary headache known for sudden onset, and duration of hours or days. It can be the thunderclap type or a change in the usual headache pattern. Usually precedes a subarachnoid hemorrhage (SAH) in days or weeks and can have multiple etiologies, like intracranial aneurysm rupture (IAR).

Objective

Describe the epidemiology, temporality, headache pattern, rebleeding odds, and the ability to recognize the SH as a prodrome of IAR based on a systematic literature review.

Methods

A search was performed using the descriptors "Sentinel Headache" AND ("aneurysm" OR "intracranial aneurysm" OR "aneurysm rupture" OR "ruptured aneurysm") in the databases PubMed, Scopus, and ScienceDirect. There was no date limit. Grey literature was not researched. Only observational studies, like cohort, transversal, and case control were selected. Other etiologies related to SH, intervention studies that analyzed only radiologic features, and reviews were excluded. The article selection was made independently by 2 authors with a high concordance index ($k=0,967$). The checklist of Prisma 2020 was followed. Rayyan app was utilized to organize the articles by peer analysis. After duplicate exclusion, 60 articles remained. They were screened by title (25 exclusions) and abstract (26 exclusions), and 9 were included in the review.

Results

The 9 selected studies estimated the incidence of SH in SAH cases by IAR. Two of them were retrospective based on medical records analysis with an incidence ranging from 6-13,8%, with the possible bias of forgetting or not asking about SH. Another 7 studies made the same evaluation by questioning the patients or their family members about thunderclap headaches or changes in headache patterns before the IAR. The incidence of SH in these studies ranged from 17,3 - 47,5%, in line with a 2003 systematic review that estimated this incidence to be between 10-43%. In a study, of the 148 cases with possible SH, 37 (25%) were due to SAH, with IAR being confirmed in 21 (14,2%) of these cases. Of the IAR confirmed cases, 6 did not perform the cranial CT scan, 6 had a normal result, and 4 evolved to death before the exam. Distinct temporality definitions of SH corroborate the heterogeneity of available epidemiological data. Two studies analyzed the average length of days before the IAR with the presence of SH, with an average of 5 days and 10,6 days, with 91,7% occurring within 30 days before the SAH. Two other studies analyzed the SH pattern within 3 months before the SAH caused by IAR. One found a thunderclap pattern in 7 (17,5%) of 40 patients, changes in headache pattern in 11 of 31 patients who presented chronic headache, and the onset of new headache in 3 (7,5%) patients. This was the only study to analyze the headache pattern according to International Headache Society. The other found that out of 91 patients with SAH, 24 presented SH; 13 (54,2%) described a throbbing headache, 10 (41,6%) reported an explosive headache, and 1 (4,2%) described a heavy headache. Only 9 (37,5%) of these sought medical care, of which 6 (66,7%) were submitted to a cranial CT scan with normal findings and without a vessel study, essential to early identification of the aneurysm. Two studies analyzed the SH and the bleeding risk with different findings. One found a rebleeding chance 10 times higher before the obliteration of the aneurysm in patients who previously had SH compared to those without SH. However, other study did not show statistical significance in the increased risk of rebleeding among patients who presented SH.

Conclusion

SH is commonly associated with IAR, preceding the event in about a month in most cases. The recall bias is a limitation that can discord the real incidence of SH. There is a need for more studies to evaluate the relationship between SH and IAR and rebleeding. The knowledge of SH by the physician is relevant, once the early aneurysm diagnosis can reduce morbimortality.

Keywords: Sentinel headache; Aneurysmal; Subarachnoid hemorrhage.