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Sentinel Headache: A Warning Sign Preceding Every Fourth Aneurysmal Subarachnoid Hemorrhage

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With great interest, we read the recent retrospective study of Oda et al[1] in the *American Journal of Neuroradiology* reporting a 33.9% incidence of minor leaks preceding aneurysmal subarachnoid hemorrhage (aSAH) confirmed by neuroradiologic methods, in which the authors found a much lower incidence of sentinel headache (SH) of 11% by patient interview. Our data from an ongoing Swiss prospective observational study (ClinicalTrials.gov identifier: NCT02129010) confirms that SH preceding aSAH is not by any means a rare phenomenon. In 8 (24.2%) of 33 patients, SH was confirmed by either the patient or next of kin. Contrary to those of Oda et al,[1] the data from our study (Table) do not indicate any difference in radiologic bleeding characteristics, such as the presence of intracerebral hemorrhage and a higher rebleeding rate, or worse outcome in patients with SH. Nonetheless, mortality in our SH group was considerably high (37.5%), which once again renders distinguishing dangerous headache from innocuous headache on clinical grounds of paramount importance. In the absence of nuchal rigidity, a diminished level of consciousness, or focal neurologic deficits, any sudden onset of atypical headache should raise the suspicion of SH and should be followed by further investigations. It is therefore important to appreciate the sensitivity and specificity and the limitations of CT and lumbar puncture.[2]

Education on a primary care level is key to correctly identifying SH and preventing major aSAH with its subsequent morbidity and mortality. For example, a Swedish educational program for local physicians proved to be effective in reducing diagnostic errors by 77%.[3] Whether any of our 8 patients confirmed positive for SH previously sought medical attention was not explicitly investigated by the study protocol. To consolidate awareness among primary care physicians, this short report of prospectively collected data complementing the retrospective study of Oda et al[1] is meant to highlight the importance of SH preceding aSAH: About every fourth patient with aSAH has preceding symptoms.

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The current study was approved by the ethics committee, St. Gallen, Switzerland (EKSG 13/011/1B). All study participants or substitute decision makers gave informed consent before taking part. Study protocol can be found at ClinicalTrials.gov (Identifier: NCT02129010).

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Characteristics of patients with aneurysmal subarachnoid hemorrhage with and without sentinel headache[a]

	Sentinel Headache		No Sentinel Headache		*P* Value
Age (yr)	54.1	45.2–71.8	53.6	49.2–60.8	.8336[b]
Admission scores					
Glasgow Coma Scale	13.0	7.8–14.4	14.0	9.9–13.6	.1912[b]
Hunt and Hess Grade	3.0	2.4–4.1	3.0	2.5–3.5	.4507[b]
WFNS grade	3.0	2.2–4.1	2.0	2.0–3.2	.2618[b]
Radiologic features					
Fisher score	3.0	2.8–3.4	3.0	2.9–3.0	.1155[b]
Intraventricular hemorrhage	5	62.5%	13	52.0%	.6992[c]
Intracerebral hemorrhage	2	25.0%	4	16.0%	.6162[c]
Acute hydrocephalus	5	62.5%	19	76.0%	.6510[c]
Aneurysm location					
ACA/AcomA	2	25.0%	11	44.0%	.5436[d]
ICA/PcomA	3	37.5%	5	20.0%	
MCA	2	25.0%	8	32.0%	
Posterior circulation	1	12.5%	1	4.0%	
Aneurysm characteristics					
Dome size (mm)	6.5	4.6–10.6	7.0	6.5–7.9	.8155[b]
Neck size (mm)	3.0	1.5–5.5	3.4	2.7–5.0	.6447[b]
Aneurysm occlusion					
Surgical occlusion	4	50.0%	9	36.0%	.6573[d]
Endovascular occlusion	3	37.5%	14	56.0%	
None	1	12.5%	2	8.0%	
Further treatment					
DHC	1	12.5%	2	8.0%	1.0000[c]
VP shunt	3	37.5%	7	28.0%	.6728[c]
Balloon dilation	–	0%	8	32.0%	.1516[c]
Complications					
Angiographic vasospasm	1	12.5%	16	64.0%	.0167[c]
DIND	–	0%	10	40.0%	.0715[c]
DCI	–	0%	5	20.0%	.3023[c]
Rebleeding	–	0%	2	8.0%	1.0000[c]
Outcome at discharge					
Death	3	37.5%	5	20.0%	.3659[c]
Unfavorable (mRS 4–5)	–	0%	1	4.0%	1.0000[c]
Favorable (mRS 0–3)	5	62.5%	19	76.0%	.6510[c]
MoCA	15.0	0.4–34.2	18.0	11.0–20.9	.9108[b]
Total	8	100%	25	100%	

Note:—ACA indicates anterior cerebral artery; AcomA, anterior communicating artery; DCI, delayed cerebral ischemia; DHC, decompressive hemicraniectomy; DIND, delayed ischemic neurologic deficit; MoCA, Montreal Cognitive Assessment; PcomA, posterior communicating artery; VP, ventriculoperitoneal; WFNS, World Federation of Neurosurgical Societies grading scale.

[a] The rates of vasospasm and DIND are lower in patients with sentinel headache probably due to higher early mortality in this group. Results are presented as medians with 95% confidence intervals for nominal variables and in absolute numbers and percentages for categoric variables.

[b] Mann-Whitney test.

[c] Fisher exact test.

[d] χ^2 test.