Interdisciplinary Neurosurgery: Advanced Techniques and Case Management 9 (2017) 34–38

Contents lists available at ScienceDirect

Interdisciplinary Neurosurgery: Advanced Techniques and Case Management

journal homepage: www.inat-journal.com

Technical Note & Surgical Technique

Common cold is the most frequent cause for misdiagnosing aneurysmal SAH

Tetsuhisa Yamada, M.D. [a,*], Yoshihiro Natori, M.D. Ph.D. [b]

[a] Department of Emergency Medicine, Iizuka Hospital, 3-83 Yoshiomachi, Iizuka-city, Fukuoka 820-8505, Japan
[b] Department of Neurosurgery, Iizuka Hospital, 3-83 Yoshiomachi, Iizuka-city, Fukuoka 820-8505, Japan

ARTICLE INFO

Article history:
Received 23 December 2016
Revised 31 January 2017
Accepted 5 February 2017

Keywords:
Subarachnoid hemorrhage
Misdiagnosis
Re-bleeding

ABSTRACT

Background: Misdiagnosis of subarachnoid hemorrhage has been hypothesized to affect outcomes. We studied patients with SAH who were admitted to our hospital to identify ways to prevent misdiagnosis.
Methods: A total of 709 patients with subarachnoid hemorrhage were admitted to the Department of Neurosurgery of our hospital from January 2003 through December 2014. Fifty patients (7.05%) received a misdiagnosis. The patients were divided into a misdiagnosis group and a correct diagnosis group and compared. We examined the clinical features associated with misdiagnoses in the 41 patients with a misdiagnosis.
Results: There were statistically significant differences between the misdiagnosis group and correct diagnosis group in age ($p = 0.017$), status at onset ($p = 0.020$), symptoms ($p = 0.000402$), period from symptom onset ($p = 1.03 \times 10^{-5}$), transportation ($p = 4.57 \times 10^{-27}$), Hunt & Kosnik grade ($p = 3.23 \times 10^{-48}$), WFNS grade ($p = 2.22 \times 10^{-25}$), type of medical institution ($p = 2.17 \times 10^{-39}$), bleeding source ($p = 0.041$), and the modified Rankin Scale at discharge ($p = 2.24 \times 10^{-5}$).
Conclusions: Subarachnoid hemorrhage was misdiagnosed as a common cold in younger patients in whom headache suddenly developed at rest, but symptoms were mild, and the patient was brought to a general practitioner at a clinic by means other than an ambulance on the day after onset or subsequently. Misdiagnosis can be prevented by suspecting subarachnoid hemorrhage and performing imaging examinations; obtaining a detailed medical history is therefore essential.
© 2017 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

The primary care of patients with non-traumatic subarachnoid hemorrhage (SAH) has a major impact on factors affecting outcomes, such as rebleeding and subsequent cerebrovascular spasm. The correct diagnosis of SAH and early initiation of appropriate treatment are therefore essential [1–8]. In fact, general or emergency physicians examine most patients with SAH at initial presentation, rather than neurosurgeons [3,5–12]. When a patient with SAH undergoes a medical examination for typical symptoms (e.g., sudden intense headache), the diagnosis is straightforward [1,3–12]. However, the presence of mild symptoms or symptoms other than headache may lead to misdiagnoses. We studied patients with SAH who were admitted to our hospital in an effort to identify ways to prevent misdiagnoses.

2. Methods

A total of 704 patients with SAH were admitted to the Department of Neurosurgery of our hospital from 2003 through 2014. Fifty patients (7.05%) received a misdiagnosis, defined as a diagnosis other than SAH at the first medical examination. Forty-one patients (5.78%) were given a misdiagnosis of a common cold. This subgroup included patients who had symptoms such as vomiting, diarrhea, fatigue, tension-type headache, heat stroke, or no particular symptoms. We compared the patients who had a diagnosis of a common cold (misdiagnosis group, 41 patients) with the patients who had a diagnosis of SAH (correct diagnosis group, 659 patients) at the first medical examination. The following variables were studied: age, sex, onset, symptoms, admission time from symptom onset, transportation, Hunt & Kosnik (H & K) grade, World Federation of Neurological Surgeons (WFNS) grade, type of medical institution, bleeding source, and modified Rankin Scale (mRS) at discharge. The time of misdiagnosis was referred to as the "initial examination," and the time of diagnosis was referred to as the "diagnostic examination." The onset day of SAH was designated as day 0. The following variables were studied in the patients with a

* Corresponding author at: 3-83 Yoshiomachi, Iizuka-city, Fukuoka 820-8505, Japan.
E-mail address: tyamadah4@aih-net.com (T. Yamada).

http://dx.doi.org/10.1016/j.inat.2017.02.006
2214-7519/© 2017 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

misdiagnosis: age, sex, interval from symptom onset to initial examination, symptoms at initial examination, H & K grade and WFNS grade at initial examination, type of medical institution performing initial examinations, transportation to initial examination, diagnosis at initial examination, imaging findings at initial examination, interval from symptom onset to diagnostic examination, symptoms at diagnostic examination, H & K grade and WFNS grade at diagnostic examination, medical institution performing diagnostic examination, transportation to diagnostic examination, imaging findings at diagnostic examination and Fisher group of CT, diagnostic methods, bleeding source, rebleeding, treatment methods, and outcomes at discharge. The results were statistically analyzed with the use of *t*-tests and chi-square tests. *p* values of less than 0.05 were considered to indicate statistical significance. All SAH in correct diagnosis group were final diagnosed with images (CT or MRI).

3. Results

The average age (±SD) of the 709 patients with SAH was 65.5 (±14.9) years. The male:female ratio of the patients was 1:1.62. A comparison between the misdiagnosis group and the correct diagnosis group is shown in Table 1. There were statistically significant differences in age ($p = 0.017$), onset ($p = 0.020$), symptoms ($p = 0.000402$), period from symptom onset ($p = 1.03 \times 10^{-5}$), transportation ($p = 4.57 \times 10^{-27}$), H & K grade ($p = 3.23 \times 10^{-48}$), WFNS grade ($p = 2.22 \times 10^{-25}$), type of medical institution ($p = 2.17 \times 10^{-39}$), bleeding source ($p = 0.041$), and mRS at discharge ($p = 2.24 \times 10^{-5}$). The clinical characteristics of the 41 patients who received a misdiagnosis are summarized in Table 2.

Table 1
Comparison between misdiagnosis group and correct diagnosis group.

		Misdiagnosis $N = 41$	Correct diagnosis $N = 659$	*p* value
Age	Mean ± SD years	58.8 ± 18.0	65.9 ± 14.6	*0.017 (*t*-test)
Sex	Male	15	180	0.199
	Female	26	479	(χ^2test)
Onset	Rest	26	222	*0.020
	Light exercise	14	303	(χ^2test)
	Heavy exercise	1	9	
	Unknown	0	125	–
Symptoms	Headache	16	121	*0.000402
	Headache + α	20	264	(χ^2test)
	Vomiting or vomiting + α	2	43	
	Drowsiness, dullness, DOC, CPA	3	231	
Admission	Day 0	29	615	$*1.01 \times 10^{-6}$
	Days 1, 2, 3	9	36	(χ^2test)
	Day 4 or subsequently	3	8	
Ambulance or walk in	Walk in	36	112	$*4.57 \times 10^{-27}$
	Ambulance	5	547	(χ^2test)
Hunt & Kosnik grade	1	37	60	$*3.23 \times 10^{-48}$
	2, 3, 4, 5	4	599	(χ^2test)
WFNS grade	I	37	127	$*2.22 \times 10^{-25}$
	II, III, IV, V	4	532	(χ^2test)
Medical institution	Clinic	25	27	$*3.67 \times 10^{-42}$
	Clinic (neurosurgeon)	2	39	(χ^2test)
	General hospital	10	86	
	ER	4	507	
Bleeding source	ACA, A-com	13	174	*0.041
	IC	15	154	(χ^2test)
	MCA	8	97	
	PCA, BA, VA	1	66	
	Unknown	4	168	
mRS of discharge	0, 1, 2	30	249	$*2.24 \times 10^{-5}$
	3, 4, 5	8	185	(χ^2test)
	6	3	222	

DOC: disturbance of consciousness, CPA: cardiopulmonary arrest, WFNS: World Federation of Neurological Surgeons, ACA: anterior cerebral artery, A-com: anterior communicating artery, IC: internal carotid artery, MCA: middle cerebral artery, PCA: posterior cerebral artery, BA: basilar artery, VA: vertebral artery.
* $p < 0.05$.

3.1. Initial examination

Medical examinations were initially performed on day 0 in 29 patients, from days 1 to 3 in 9 patients, and on day 4 or subsequently in 3 patients. As for symptoms, 16 patients had only headache, 17 had headache and vomiting, 1 had headache and earache, 1 had headache and dizziness, 1 had headache and pharyngeal pain, 2 had vomiting and diarrhea, 1 had dullness, 1 had dullness and eye pain, and 1 had drowsiness. The H & K grade of SAH was 1 in 37 patients and 2 in 4 patients. The WFNS grade of SAH was I in 37 patients and II in 4 patients. The type of medical institution initially consulted was a clinic by 27 patients (18 internal medicine, 2 cardiology, 1 surgery, 2 orthopedics, 2 otorhinolaryngology, and 2 neurosurgery), a general hospital by 10 patients (9 general physicians, 1 neurologist), and a critical care center by 4 patients (2 general physicians and 2 emergency physicians). Four patients were transported to medical institutions by ambulance, and the other 37 patients were transported by other means. The misdiagnosis made at the initial medical examination was a common cold in 26 patients, diarrhea and vomiting in 3, vomiting in 1, heat stroke in 1, tension-type headache in 1, fatigue in 1, prolonged effect of benzodiazepine in 1, and no particular symptoms in 7. Diagnostic imaging comprised computed tomography (CT) of the head in 3 patients and magnetic resonance imaging (MRI) of the head in 1 patient, but did not result in a diagnosis of SAH. Two patients were given misdiagnoses by neurosurgeons.

3.2. Diagnostic examination

SAH was diagnosed on day 0 in 3 patients, on days 1 to 3 in 17 patients, on days 4 to 14 (referred to as the "cerebrovascular spasm" period) in 19 patients, and on day 15 or subsequently in 2 patients. The latest diagnosis of SAH was made on day 19. As for the symptoms at the time of diagnosis, 16 patients had headache, 9 had headache and vomiting, 1 had headache and paresthesia, 1 had headache and loss of consciousness, 1 had headache and fever, 1 had headache and hemiparesis, 4 had hemiparesis, 1 had vomiting, 1 had vomiting and fever, and 6 had disturbed consciousness or restlessness. The H & K grade of SAH was 1 in 20 patients, 2 in 13 patients, 3 in 4 patients, 4 in 3 patients, and 5 in 1 patient. The WFNS grade of SAH was I in 25 patients, II in 11 patients, III in 3 patients, and IV in 2 patients. As for the type of medical institution, the diagnosis was made at a clinic in 9 patients (internal medicine, 1; neurosurgery, 8), a general hospital in 13 patients (internal medicine, 10; cardiology, 1; neurology, 1; neurosurgery, 1), and a critical care center in 19 patients (general physicians, 5; emergency physicians, 14). The diagnosis was made by neurosurgeons in 9 patients. Five patients were admitted to the hospital on the first medical examination. Fifteen patients were transported by ambulance, and 21 patients were transported by other means. Diagnostic imaging comprised CT of the head in 33 patients, MRI of the head in 7 patients, and both in 1 patient. The diagnostic method was CT in 31 patients, MRI in 6 patients, and lumbar tap in 4 patients. The bleeding source was an anterior communicating artery aneurysm in 12 patients, an internal carotid artery aneurysm in 15 patients, a middle cerebral artery aneurysm in 8 patients, an anterior cerebral artery aneurysm in 1 patient, a vertebral artery dissection in 1 patient, and unknown in 4 patients. Symptoms and imaging

Download English Version:

https://daneshyari.com/en/article/5629443

Download Persian Version:

https://daneshyari.com/article/5629443

Daneshyari.com