Misdiagnosis of the Aneurysmal Subarachnoid Hemorrhage (Incidence, Cause and Clinical outcome of the Misdiagnosis)

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Introduction

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Subarachnoid hemorrhage (SAH) is associated with high morbidity and mortality. More than ten percent of patients with SAH die, and 30% of survivors are left with significant neurological disability. The most relevant prognostic factors of the aneurysmal SAH are the level of consciousness and neurologic grade on admission. Therefore, at the moment of disease, clear recognition of the signs or symptoms of aneurysmal SAH, early diagnosis and administration of the appropriate treatment are essential for improving the outcome of these patients. However, delayed diagnosis or misdiagnosis is not necessarily rare. Yet, the rate of patients with aneurysmal SAH who are misdiagnosed is not known. To determine the rate, causes, and clinical outcomes of this misdiagnosis, we reviewed medical records of consecutive patients managed by our institution in the recent five years.

Methods

This study was reviewed and approved by out Institutional Review Board (YUH-13-0343-B2)

We conducted a retrospective review of medical records of consecutive patients with an aneurysmal SAH from January 2006 to December 2010. This study included all patients presenting with symptoms or signs due to an aneurysmal hemorrhage. SAH due to other vascular disease (traumatic SAH or arteriovenous malformation or other secondary cause) was excluded. SAH was diagnosed according to computed tomography (CT) or by xanthochromia of cerebrospinal fluid (CSF) or by surgical operation. Demographic data, medical and social history, and clinical features at admission were obtained through interviews with patients and patients' family members and surrogates and medical records were reviewed.

Results

From January 2006 to December 2010, 598 patients were treated due to an aneurysmal SAH in our institution. Thirty one patients (31/598, 5.2%) were misdiagnosed at initial medical contact. Among patients who were misdiagnosed, no appropriate diagnostic imaging test (computed tomography (CT) scan) was performed in 23 patients (23/31, 74.2%) at initial medical contact. Image interpretation errors occurred in six patients (6/31, 19.4%). When a diagnostic image showed a clinically suspected negative finding, no further examination (lumbar puncture, further MR image etc.) was performed in two patients (2/31, 6.5%). Misdiagnosis of 26 patients (26/31, 83.9%) occurred in nonteaching hospitals and five patients (5/31, 16.1%) received a misdiagnosis in teaching hospitals. Clinical deterioration occurred in 14 patients (14/31, 45.2%).

Four patients (4/31, 12.9%) suffered fatal rebleeding and ten patients (10/31, 32.3%) showed neurological deterioration (Hunt-Hess grade=3) before receiving a correct diagnosis and definitive management.

Conclusions

In this study, misdiagnosis of an aneurysmal SAH occurred in 5.2% (31/598) of patients. An unfavorable outcome (Glasgow outcome scale, 1 to 3) occurred in 29.0% (9/31) of patients. More detailed examination and a low threshold for diagnostic imaging tests, such as CT scan of patients with mild symptoms suggestive of aneurysmal SAH may reduce the frequency of misdiagnosis.

Learning Objectives

Knowing the cause of misdiagnosis of aneurysmal SAH is essential factor for reduce the misdiagnosis and improving the clinical outcome.