Aneurysm Location and Etiology of Hyponatremia Following Aneurysmal Subarachnoid Hemorrhage

Haydn Hoffman, MD; Robert Ziechmann, B.A.; Grahame Gould, M.D.; Lawrence S Chin, M.D.
Department of Neurosurgery, SUNY Upstate Medical University
Disclosures

The authors have no financial or organizational relationships with commercial interests or other entities to disclose.
Introduction

Hyponatremia is a common complication following aneurysmal subarachnoid hemorrhage (aSAH). It most commonly results from the syndrome of inappropriate antidiuretic hormone secretion (SIADH) or cerebral salt wasting (CSW). The relationship between aneurysm location and the etiology of hyponatremia has not been well characterized, and so was the subject of this study.
Methods

Retrospective analysis was performed for 114 consecutive patients who presented with aSAH and subsequently developed hyponatremia before post bleed day 14. Electronic health records were reviewed to obtain data regarding aneurysm location, treatment, etiology of hyponatremia, and Modified Rankin Scale at hospital discharge.
Results

In total there were 67 (59%) patients with anterior circulation and 47 (41%) with posterior circulation aneurysms. The majority of patients, 85 (75%), had hyponatremia due to SIADH while 14 (12%) had CSW and 15 (13%) had hyponatremia due to other causes. SIADH was more common than CSW in patients with anterior circulation aneurysms (90%) compared to those with posterior circulation aneurysms (75%). This trended toward but did not reach statistical significance (p = 0.08). More severe Hunt and Hess grades were associated with the development of CSW rather than SIADH (p = 0.002).
Discussion

Whether SIADH or CSW more commonly contributes to hyponatremia after aSAH has been a point of debate in the literature. We found that CSW is a relatively uncommon etiology of hyponatremia, occurring in only 12% of our cohort. SIADH was far more common, occurring in 75%, although the incidence of CSW increases with Hunt and Hess grade. Anterior circulation aneurysms may be associated with a higher rate of SIADH than those in the posterior circulation. We hypothesized that given the closer proximity of anterior circulation arteries to the neurohypophysis and hypothalamus, aneurysmal rupture in this location could have a greater impact on the HPA axis.
Summary Points

- In patients with aSAH, SIADH was more common than CSW.
- Higher Hunt-Hess grade was associated with a higher incidence of CSW.
- There was a higher incidence of SIADH with anterior circulation aneurysms.