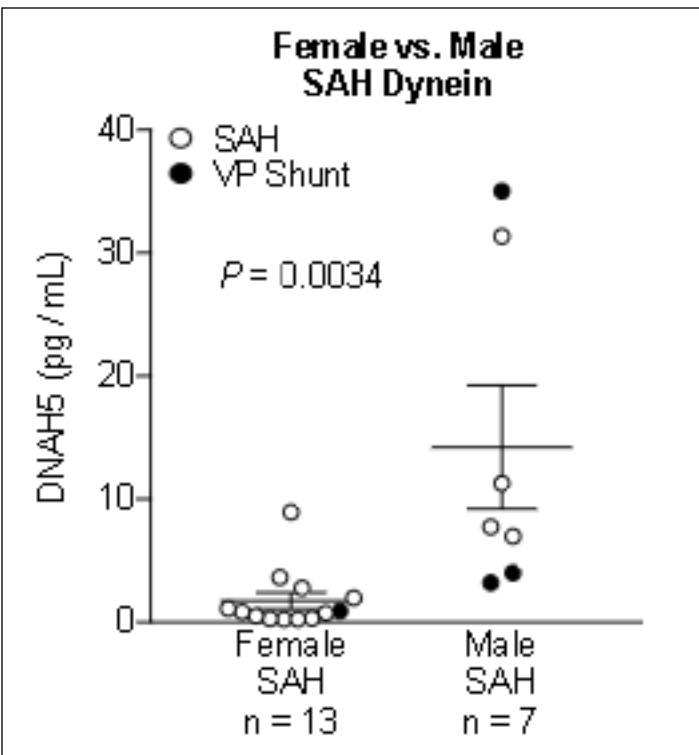


Introduction

Hydrocephalus following aneurysmal-pattern subarachnoid hemorrhage (apSAH) often necessitates procedural intervention but pathophysiology of this process is incompletely understood. Loss of ependymal cilia, which have a role for cerebrospinal fluid (CSF) dynamics, may play a significant role in both acute and chronic hydrocephalus following apSAH. We hypothesized apSAH patients requiring ventriculoperitoneal shunt (VPS) have increased exuded cilia in their CSF.

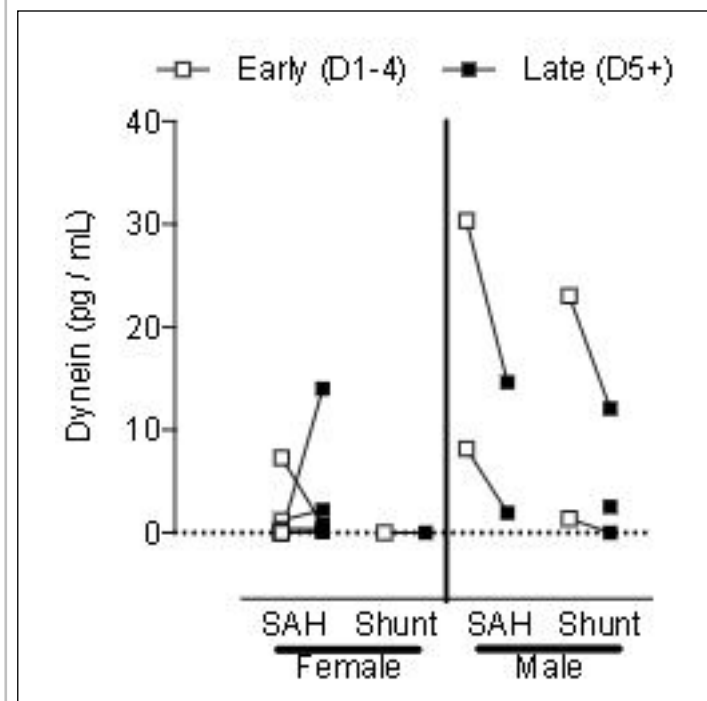


Methods

We performed a prospective study of 40 patients' CSF, 20 apSAH and 20 controls. We collected multiple CSF samples from each apSAH patient's external ventricular drain at various timepoints (post-bleed day 0-1, 4-6, and/or the day of EVD removal) and a single CSF sample from each control during their elective craniotomy. The samples underwent ELISA evaluation for DNAH5 (MyBioSource) concentrations.

Results

Forty patients were enrolled, 20 in each group. The apSAH group consisted of 65% females (13/20). The control group consisted of 90% females (18/20). In the apSAH group, CSF DNAH5 was higher in males compared to females ($p=0.0034$). DNAH5 also demonstrated a decreasing trend in the male apSAH group when comparing early (post-bleed day 0-4) DNAH5 concentration vs late (day 5+). There was not a significant difference in CSF DNAH5 concentration between the control and apSAH groups.



Conclusions

This pilot study demonstrates the cilia marker DNAH5 is detectable in CSF of patients with apSAH. Additionally, males have a higher DNAH5 concentration than females with apSAH hydrocephalus. The findings of the male apSAH group requiring 75% of VPS placement and a decreasing trend of CSF DNAH5 concentration while managing hydrocephalus are of uncertain clinical importance. Altogether these findings suggest ependymal cilia changes in apSAH play a role in associated hydrocephalus.

Learning Objectives

By the conclusion of this session, participants should be able to:

- 1) Describe initial cerebrospinal fluid DNAH5 concentration differences between males and females with hydrocephalus following apSAH,
- 2) Discuss cerebrospinal fluid DNAH5 trend differences between males and females with hydrocephalus following apSAH.

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