

Letter to the Editor

Aneurysmal subarachnoid hemorrhage occurring while driving and road traffic accidents

Dear Editor.

Several human activities such as defecation are known to trigger aneurysmal subarachnoid hemorrhage (aSAH).¹ While car drivers may experience stress-induced blood pressure elevation as high as 20 mmHg,² there has been no scientific evidence that driving triggers aSAH. Nevertheless, information on the clinical picture of aSAH occurring while driving may be useful to emergency medicine physicians/emergency medical services (EMSs), considering that drivers who experience aSAH may cause road traffic accidents (RTAs) and injury to themselves or others on the road. The behavioral response of SAH-afflicted drivers, that is, how frequently they can avoid RTAs by pulling over, has not been reported in the literature, either. Furthermore, it may be interesting to investigate how aSAH-afflicted drivers present to medical institutions. Following approval by our Institutional Ethics Committee, we conducted a single-center retrospective observational study to document the behavioral responses and mode of emergency department (ED) arrival of patients who sustained aSAH while driving. We used a

data set of 623 patients with aSAH (218 men/405 women; mean age, 63.9 ± 14.8 years) admitted to our ED between January 2008 and December 2020. Among them, 16 patients (6 men/10 women; mean age, 53.7 ± 11.0 years) had sustained an aSAH while driving, with an overall frequency of 2.6%. A ruptured aneurysm was located in the anterior circulation in 14 and in the posterior circulation in the other 2. The behavioral response of the 16 aSAH-afflicted drivers is shown in Figure 1. Five drivers (31%) lost control of their vehicle, causing an RTA. All of the five drivers were found unresponsive in his/her vehicle, and a call for EMS had been made either by police officers or by witnesses of the RTA. The other 11 drivers (69%) avoided an RTA by pulling over. Among them, six made an emergency call by themselves or drove to a nearby ED. However, the other five drivers were unable to make an emergency call. Mostly, passersby who found the driver lying unconscious behind the wheel made an emergency call. Regarding the outcomes evaluated at discharge, 13 drivers had a Modified Rankin Scale score of 3 or less.

Response of drivers after sustaining aSAH (n=16)

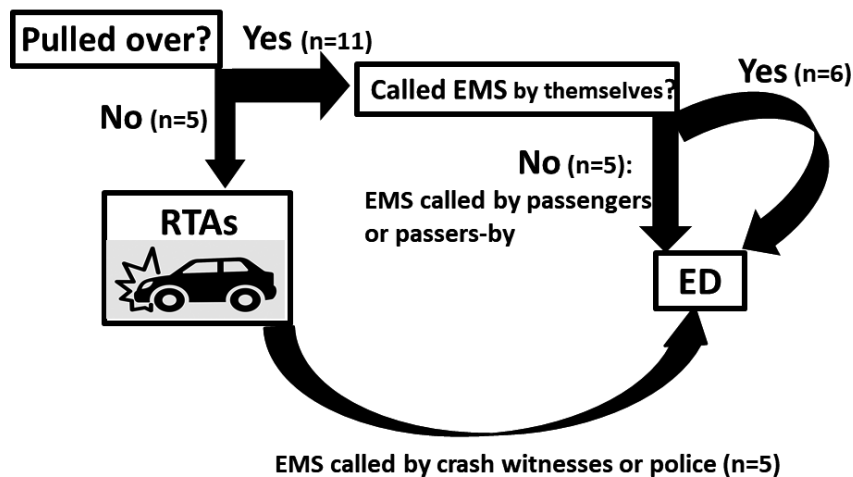


Fig. 1. The response of 16 drivers after sustaining aneurysmal subarachnoid hemorrhage (aSAH) is shown. Five (31%) caused a road traffic accident (RTA). They were brought to our emergency department (ED) after either police officers or witnesses of the RTA called emergency medical services (EMSs) for help. The other 11 (69%) were able to avoid RTA by pulling over: while 6 were able to make an emergency call by themselves, the other 5 were unable to do so: passersby who found the driver lying unconscious behind the wheel made an emergency call.

Patients who sustain aSAH frequently experience loss of consciousness (either transient or long-lasting).³ A recent study found that approximately 40% of patients with aSAH had experienced loss of consciousness by the time they arrived at ED.⁴ The frequency of RTA in aSAH-afflicted drivers (31%) seems to be compatible with that finding. However, our study has many limitations: for example, while the proportion of the posterior circulation aneurysms in our cohort appears to be high (2/16, 13%), no definite conclusion on the relationship between aneurysm location and probability of causing RTA could be drawn because of the small sample size. Prospective, multicenter studies are warranted to confirm our finding. Interestingly, nearly half of drivers who avoided RTA by pulling over were unable to make an emergency call, which might have resulted in therapeutic delay. Introduction of artificial intelligence to the cockpit, including facial motion recognition techniques,⁵ may enable earlier detection of drivers who cannot make an emergency call.

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DISCLOSURE

Approval of Research protocol: The study design was approved by Saiseikai Utsunomiya Hospital Institutional Review Board (No. 2017-0013).

Informed Consent: Our IRB determined that written consent from each patient was not necessary.

Registry and the Registration No. of the study/Trial: N/A.

Animal Studies: N/A.

Conflict of Interest: None declared.

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