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Aneurysmal Subarachnoid Hemorrhage and Severe, Catheter-Induced Vasospasm Associated with Excessive Consumption of Caffeinated Energy Drink

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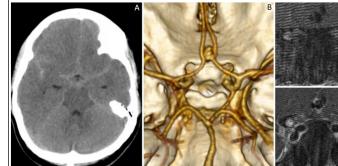
Introduction

Excessive consumption of legal, over-the-counter stimulants is associated with coronary vasospasm, thrombotic complications, and sudden cardiac death; however, their untoward effects on cerebrovascular physiology are not yet described in the neuro-interventional literature. Patients are increasingly exposed to high levels of these vasoactive substances in the form of caffeinated energy drinks and specialty coffees.

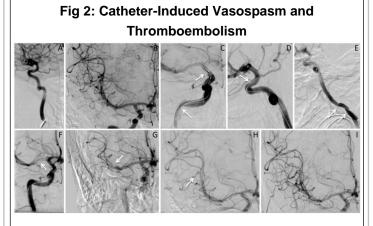
Methods

We report a case of aneurysmal subarachnoid hemorrhage (SAH) and severe, catheter-induced vasospasm during attempted endovascular repair of a ruptured anterior communicating artery (AComA) aneurysm in the setting of excessive energy drink consumption. We review the literature and alert clinicians to this potentially serious complication.

Fig 1: Ruptured ACom Aneurysm



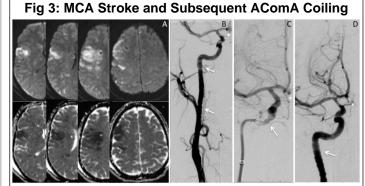
A. Axial non-contrast CT demonstrating basal cistern SAH extending up into the anterior inter-hemispheric fissure.
 B. 3D CTA reconstruction demonstrating 5mm dysplastic ACom aneurysm.
 C. Coronal high-resolution MR vessel wall imaging demonstrating copious enhancement of the ACom aneurysm identifying the rupture point (upper panel pre-contrast, lower panel post-contrast)



A+B. Control runs demonstrating ACom aneurysm and no vasospasm. C. Petrous cavernous and clinoid segment ICA vasospasm with flow limitation. D. Improved flow after removal of guide catheter. E. Proximal ICA vasospasm. F. Development of M1 segment clot which subsequently dislodged with IA reopro. G. M2 branch thromboembolic occlusion. H. Mechanical thrombectomy with Solitaire retrieval device. I. Final run with resolution of clot.

Results

A 44yF presented as a HH2, F3 SAH secondary to a ruptured, wide-necked, 5-mm AComA aneurysm. She had habitual, excessive energy drink consumption including 5 oversized-cans of a commercial energy drink consumed that day. Prior to bringing a 6F Cook Shuttle into the distal R CCA, the patient was fully heparinized (ACT > 250). During attempted balloon-assisted coiling, she developed severe, flow-limiting, catheter-induced, precavernous-ICA vasospasm with subsequent thromboembolism into the right MCA. This was managed with withdrawal of the offending catheters, oro-gastric ASA, intra-arterial ReoPro (5mg), and mechanical thrombectomy. Although she suffered a sizeable right MCA stroke, her aneurysm was successfully treated the following day after intra-arterial injection of verapamil through the guide catheter with notably less catheter-induced spasm.



A. Right MCA stroke. B-D. Retreatment angiogram. B.
Residual ICA Vasospasm (arrows) and filling of AComA(*).
C. Increased catheter induced vasospasm (arrow) which subsequently resolved with IA verapamil and repositioning of catheter. D. Post-coiling run with occlusion of aneurysm (*) and non-flow limiting residual vasospasm (arrow).

Conclusions

Energy drink beverages are an increasingly popular form of caffeine consumption (80-160mg caffeine/drink) and also contain other vasoactive substances. These beverages are associated with endothelial dysfunction, vasoconstriction, thrombosis, and platelet aggregation. It is plausible that excessive energy drink consumption played a role in the unusual occurrence of such severe, catheter-induced vasospasm and clot formation. We recommend that clinicians routinely query their patients about excessive energy drink consumption.

References

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