Warfarin-induced Isolated Spontaneous Subarachnoid Hemorrhage: Rare Case Report

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Case Report

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Warfarin-induced Isolated Spontaneous Subarachnoid Hemorrhage: Rare Case Report

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Abstract

Subarachnoid hemorrhage (SAH) is mostly associated with head trauma. Non-traumatic subarachnoid hemorrhage is mostly due to vascular abnormalities: either hemorrhage from ruptured aneurysm or bleeding from atriovenous malformation. Aneurysmal hemorrhage is the biggest cause in non-traumatic cases. Warfarin is associated with cerebral intraparenchymal hemorrhage, but it is rarely associated with SAH. Here, we report a case of a 45-year old male patient who was admitted to the neurology ward of our hospital due to acute ischemic stroke. The patient was treated with a vitamin K antagonist (warfarin). However, on the third day, his condition deteriorated (his GCS regressed from 11/15 to 5/15). Pupils were anisocoric. Brain CT done immediately showed extensive subarachnoid hemorrhage without intraparenchymal involvement. The patient was intubated and transferred to the intensive care unit. Due to his poor condition, neurosurgical intervention could not be done. The patient was managed conservatively, but the patient passed away 4 days later in the intensive care unit.

Warfarin is rarely associated with subarachnoid hemorrhage, especially when it is only isolated subarachnoid hemorrhage. Aneurismal rupture and trauma should be excluded before diagnosis of warfarin related SAH is made.

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Introduction

Subarachnoid hemorrhage accounts for 3% of all strokes, and 5% of stroke related deaths and for more than one quarter of of potential life years lost due to stroke [¹]. Majority of cases of non-traumatic SAH are due vascular abnormality either ruptured aneurysm (85% of cases) or other vascular malformations [², ¹¹]. Other associated etiologies of spontaneous SAH include dural fistula or dural sinus thrombosis, cocaine use and coagulation disorders [⁶]. Use of anticoagulation is associated with increased risk of intracranial hemorrhage. However, in most of the cases warfarin causes intraparenchymal hemorrhage rather than subarachnoid bleeding [³, ⁴].
The occurrence of isolated subarachnoid hemorrhage without involvement of cerebral parenchyma is rare finding \[5\]. Here we present a case of isolated subarachnoid hemorrhage without parenchymal involvement after treatment with warfarin for acute ischemic stroke.

**Case Presentation**

45-year old male patient was admitted the emergency to the neurology ward of our hospital with decreased level of consciousness (GCS of 11/15) and left side weakness (power 1/5 on MRC scale). Brain MRI with diffusion sequence showed multiple cerebral infarct (see figure 1). The patient was admitted to the neurology ward. He had no prior history of hypertension, diabetes mellitus, known cardiac disease or coagulation disorder. He had no previous history of stroke. He had no history of drug abuse. His baseline ECG and transthoracic echocardiography did not show any underlying cardiac pathology. MRI Cerebral angiography did not show underlying stenosis or aneurysm (see figure 2). The patient was admitted to the neurology ward. He was treated with a vitamin K antagonist (warfarin) for secondary prevention with regular INR control. However, on the third day of treatment, his condition deteriorated (his GCS regressed from 11/15 to 5/15). Pupils were anisocoric. Brain CT done immediately showed extensive subarachnoid hemorrhage without intraparenchymal involvement (see Figure 3). Laboratory investigation showed INR of 2.8 APTT 52. The patient was intubated and transferred to the intensive care unit. Due to his poor condition, neurosurgical intervention could not be done. The patient was managed conservatively, but unfortunately the patient passed away 4 days later in the intensive care unit.

Since there was no associated other risk factors for subarachnoid hemorrhage, warfarin administration was considered as the potential cause of acute subarachnoid bleeding in this case. Mostly warfarin is associated with intracranial hemorrhage other than SAH. What makes this case interesting is that the patient developed isolated subarachnoid hemorrhage without cerebral parenchymal involvement.
Figure 1: A, B: Brain Diffusion & ADC MRI sequences showing multiple diffusion restrictions consistent with acute infarct.

Figure 2: Non-Contrast Brain CT; A, B, C showing subarachnoid hemorrhage in the basal cisterns and sylvian fissure without intraparenchymal bleeding.

Figure 3: A, B, C & D: Brain MR Angiography, not showing any evidence of vascular malformation.
Discussion

Subarachnoid hemorrhage (SAH) is mostly caused by trauma or aneurismal rupture in most cases. SAH is a serious neurologic emergency with an incidence of 6–7 cases per 100,000 per year. SAH has 40% mortality among hospitalized patients for Acute SAH. Nearly 85% of spontaneous SAH cases are due to rupture of an intracranial aneurism \[3, 7\]. Epidemiological data on SAH risk factors are not well established. Associated risk factors are smoking, hypertension, and excessive alcohol intake \[12\]. About 15% of spontaneous SAH patients have no angiographic finding of demonstrable source of hemorrhage. Intracranial hemorrhage is one of the most serious complications of warfarin anticoagulation. Intracranial hemorrhage associated with warfarin can be categorized into intraparenchymal, subdural/epidural, and subarachnoid \[9\]. Intraparenchymal hemorrhage accounts approximately 70% of anticoagulation-associated intracranial hemorrhages. Occurrence of isolated subarachnoid hemorrhage is rare. Up to now very few cases have been reported in the literature \[13\].

Use of vitamin K antagonists is associated increased risk of hemorrhage. Warfarin increases the overall risk of intracranial hemorrhage and is responsible for higher mortality and disabilities among its users \[8\]. According to Mattle et al, patients on vitamin K antagonist have a four times higher incidence of extracranial/intracranial bleeding (subdural, epidural, and subarachnoid hemorrhage) than the general population (25 of the 155 studies investigated) \[10\].

Warfarin-related intraparenchymal hemorrhage is a common incidence in the literature. Nevertheless, isolated spontaneous subarachnoid hemorrhage in these patients is a rare occurrence. Patients on anticoagulation may develop SAH on minimal head trauma, therefore it should be excluded. For accurate diagnosis of warfarin induced SAH, presence of intracranial aneurysm or other intracranial vascular abnormality should be excluded through cerebral angiography and magnetic resonance imaging \[14\]. Our case was in the hospital when he was anticoagulated for acute ischemic stroke. He did not suffer any head trauma. MR angiography excluded any intracranial aneurysm. Likewise brain MRI did not show any vascular anomaly. Warfarin associated SAH should be managed with correction of the INR to reduce the risk of expanding hemorrhage \[15\]. The present case was treated with fresh frozen plasma and Vitamin K, but due to poor condition he did not survive, we lost the patient due to massive SAH.
Conclusion

Oral Anticoagulation is mostly associated with cerebral intraparenchymal hemorrhage. Warfarin related Isolated SAH is very rare event. Patients on warfarin should be monitored for the possibility of SAH. Here we reported an interesting and rare case of isolated warfarin induced SAH.

Consent for publication: Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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