Case Report

Anticoagulant Therapy and Road Traffic Accident - "Double Danger"

Sentitoshi*, Pramod Kumar GN**, Balaraman R***

ABSTRACT

Oral anticoagulants are commonly prescribed in heart disease, geriatric patients and cases predisposed to thrombotic phenomenon. There is always a danger of haemorrhagic complications of these drugs, either spontaneous or associated with trauma. This article is of a patient on anticoagulant therapy with minor trauma to the head resulting from a road traffic accident with severe intracranial haemorrhage resulting in death.

Key Words: Oral anticoagulant; Intracranial haemorrhage; Head injury; Road traffic accident

INTRODUCTION

Oral anticoagulant (OAC) therapy is prescribed to prevent thromboembolic complications in cases with atrial fibrillation, deep venous thrombosis, surgically placed cardiac valves, etc.[1] Haemorrhagic diathesis is a possible complication of anticoagulant therapy, of which the most serious and lethal is intracranial haemorrhage (ICH).[2,3] The inherent risk of ICH in patients without OACs is strongly related to patient age and hypertension, but in patients on OACs it has been hypothesized to be this inherent risk multiplied by a factor determined by intensity of anticoagulation.[4] Conventional intensities of anticoagulation (INR: 2.5–4.5) increase the risk of ICH 7–10 fold.[5,6] Mina et al noted that a head injury patient with preinjury anticoagulation had a 4–5 fold higher risk of death than the non-anticoagulated patient.[7] The mortality of OAC-associated ICH is approximately 60%, making these strokes far more lethal than brain infarction.[8]

Intra-cranial bleeding is also the most common contributing factor for death associated with head injury in road traffic accident.[9,10]

In this article, we present a case of head injury on anticoagulant therapy.

The Case: A 60-year-old female was brought dead to the hospital, with a history of road traffic accident. She was a known case of hypertension and rheumatic heart disease on medical treatment, with a history of mitral commissurotomy, done for mitral valve stenosis. At the time of her death, she had mitral and tricuspid valve regurgitation and pulmonary arterial hypertension. Detailed history of the incident revealed that she had been heading for her regular postoperative follow-up on a motorbike as a pillion rider when, as a result of speeding over a speed breaker she was thrown off the bike and landed on her back with her head hitting the ground. She was taken to the casualty of the nearest government hospital where the duty doctor noted a contusion on the posterior scalp with no loss of consciousness or vomiting, for which she was treated and then discharged. The patient resumed her journey for her follow-up consultation.

*(*Author for correspondence*): Dept of Forensic Medicine, Mahatma Gandhi Medical College & Research Institute, Pillaiyarkuppam, Pududcherry 607402. Email: dr.senti@yahoo.co.in

**Dept of Forensic Medicine, Mahatma Gandhi Medical College & Research Institute, Pillaiyarkuppam, Pududcherry 607402.

***Dept of Forensic Medicine, Indira Gandhi Government General Hospital, Puducherry.

The consultant documented that the patient reached in a drowsy state with thready pulse and blood pressure difficult to elicit, for which he referred the patient immediately back to the government hospital for further evaluation, where she was declared brought dead. The entire incident from the time of fall from the bike to the moment she was declared dead occurred over a period of about 3 hours.

The patient had been on the following medications: bisoprolol, spironolactone, furosemide, acenocoumarol (oral anticoagulant), etc.

An autopsy was done on the deceased, which revealed a contusion on the scalp over the occipital area of 3x2.5 cm size. Skull bones were intact; intracranially the meninges were congested, and there was a 7x4.5 cm size sub-arachnoid haemorrhage over the right temporal area. A contre-coup injury on the midline and right of frontal brain was noted but no corresponding coup injury over the occipital part of the brain was present (**Fig 1**). The base of the brain showed presence of subdural haematoma with subarachnoid haemorrhage (**Fig 2**). On examination of the heart, the pericardium was found adhered to the anterior wall of the heart. On opening the heart, all the chambers were dilated and tricuspid valve showed commissurotomy with area of thickening and calcification. The cause of death was opined as 'subdural haematoma with sub-arachnoid haemorrhage following head injury due to fall from bike.'

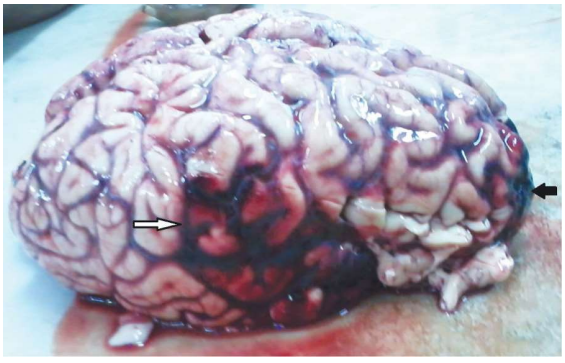

Fig 1: Subarachnoid haematoma on right temporal area *(white arrow)* and contre-coup injury on frontal lobe *(black arrow)*

DISCUSSION

Intracranial haemorrhage, a common occurrence in road traffic accidents associated with head injury often cause death. But in this particular case with a head injury, complication of anticoagulant drug therapy needs to be considered.

Whether the anticoagulant caused the intracranial bleed prior to head injury as a complication of anticoagulant therapy needs to be debated. If such a doubt existed in this case however, it can be excluded, as the deceased did not give any history of altered state of mind or features suggesting intracranial bleed prior to the fall, the first time she consulted the doctor following fall from the bike.

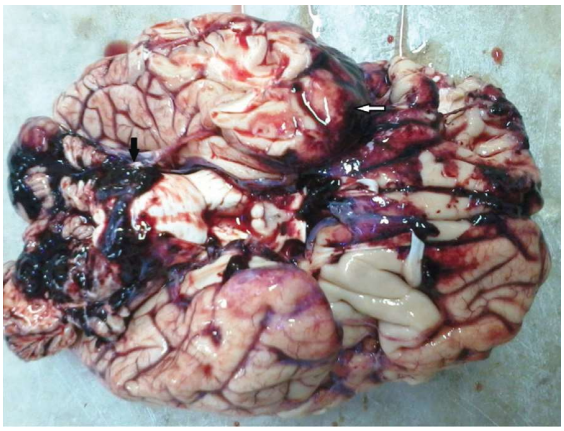

Fig 2: Subdural hematoma over base of brain with subarachnoid haemorrhage

More importantly, the real problem for a doctor in such cases is any legal aftermath with regard to management, by way of failing to timely diagnose and manage ICH that resulted in fatal outcome. And so the question is, should such cases be managed the same way as head injury with no OAC therapy, or should it be managed differently?

As an answer to the above question, The European Federation of Neurological Societies 2002 Guidelines clearly recommends that all anticoagulated patients with minor head injury must be subjected to an initial CT scan at admission, with 24-hr period of close neurologic observation, and then a second CT scan before discharge.[1,11] Studies conducted by Karni et al[12] and Reynolds et al[13] on the risk of intracranial haemorrhage in anticoagulated patients with minor head injury on a first CT scan suggest 7% risk in the general population, and 25% in patients older than 65 years, respectively.

CONCLUSION

Trauma in patients on OAC therapy gives rise to a double danger for the risk of fatal intracranial haemorrhage. This means that doctors must be cautious in managing such cases avoiding any room for complacency to detect and manage early features of any complications, and therefore avoid legal aftermath related to management of such cases.

REFERENCES

1. Leiblich A, Mason S. Emergency management of minor head injury in anticoagulated patients. *Emerg Med J* 2011;28:115–118.
2. Stroke Prevention in Atrial Fibrillation Investigators. Bleeding during antithrombotic therapy in atrial fibrillation. *Arch Intern Med* (In press).
3. Van der Meer FJM, Rosendaal FR, Van den Broucke JP, Briet E. Bleeding complications in oral anticoagulant therapy. *Arch Intern Med* 1993;153:1557–1562.
4. Wintzen AR, De Jonge H, Loeliger EA, Botts GT. The risk of intracerebral hemorrhage during oral anticoagulant treatment: a population study. *Ann Neurol* 1984;16:533–558.
5. Anticoagulants in the Secondary Prevention of Events in Coronary Thrombosis (ASPECT) Research Group. Effect of long-term anticoagulant treatment on mortality and cardiovascular morbidity after myocardial infarction. *Lancet* 1994;1:499–503.
6. Franke CL, De Jonge J, Van Swieten JC, Op de Coul AAW, Van Gijn J. Intracerebral hematomas during anticoagulant treatment. *Stroke* 1990;21:726–730.
7. Mina AA, Knipfer JF, Park DY, Bair HA, Howells GA, Bendick PJ. Intracranial complications of preinjury anticoagulation in trauma patients with head injury. *J Trauma* 2002;53:668–672.
8. Hart RG, Boop BS, Anderson DC. Oral anticoagulants and intracranial hemorrhage facts and hypotheses. *Stroke* 1995;26: 1471–1478.
9. Sharma BR, Harish D, Singh G, Vij K. Patterns of fatal head injury in road traffic accidents. *Bahrain Med Bull* 2003;25(1): 22–25.
10. Akang EEU, Kuti MA, Osunkoya AO, et al. Pattern of fatal head injuries in Ibadan - a 10 year review. *Med Sci Law* 2002; 42:162–166.
11. Lavoie A, Ratte S, Clas D, Demers J, Moore L, Martin M, Bergeron E. Preinjury warfarin use among elderly patients with closed head injuries in a trauma center. *J Trauma* 2004;56(4): 802–807.
12. Karni A, Holtzman R, Bass T, Zorman G, Carter L, Rodriquez L, Bennett-Shipman VJ, Lottenberg L. Traumatic head injury in the anticoagulated elderly patient: a lethal combination. *Am J Surg* 2001;67(11):1098–1100.
13. Reynolds FD, Dietz PA, Higgins D, Whitaker TS. Time to deterioration of the elderly, anticoagulated, minor head injury patient who presents without evidence of neurologic abnormality. *J Trauma* 2003;54(3):492–496.