Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Radiology

Cerebral Ischaemia Secondary to Anticoagulant Treatment in a Haemophiliac Patient: A Case Report

A H. Keita[1*], F. Sidibe[1], Y. Bouktib[1], B. Bouktakioute[1], N. Najat Idrissi Ganouni[1]

[1]Department of Radiology, Arrazi, CHU Mohamed VI Marrakech, Morocco

DOI: 10.36347/sjmcr.2023.v11i10.046 | **Received:** 06.09.2023 | **Accepted:** 11.10.2023 | **Published:** 29.10.2023

***Corresponding author:** A H. Keita
Department of Radiology, Arrazi, CHU Mohamed VI Marrakech, Morocco

Abstract **Case Report**

We report the case of a 21-year-old patient who had been treated for haemophilia A since the age of 8. He had a family history of haemophilia, as his maternal uncle also suffered from the disease. During his life, he had suffered several episodes of joint and muscle haemorrhages for which he had received replacement therapy with recombinant factor VIII (Kogenate). However, three months after his last treatment, the patient developed headaches and neurological deficits, in particular paresthesias in his lower limbs. Cerebral magnetic resonance imaging (MRI) revealed nodular and focal signal abnormalities in several brain regions, as well as minimal triventricular hydrocephalus with intraventricular haemorrhage. This clinical and radiological presentation led to the diagnosis of cerebral ischaemia secondary to anticoagulant treatment.

Keywords: Haemophilia, Ischemia, Haemorragie, Imagery, Factor VIII.

INTRODUCTION

Haemophilia is an inherited blood disorder characterised by a deficiency in clotting factor, making patients prone to prolonged bleeding, particularly from joints and muscles. The main treatment for haemophilia is the administration of recombinant clotting factor, such as factor VIII, to correct the deficiency and prevent bleeding [1]. However, frequent use of recombinant coagulation factors can lead to complications, including rare but serious thrombotic events [2]. In this study, we report the case of a young patient with haemophilia since the age of 8, treated with recombinant factor VIII (Kogenate), who showed foci of ischaemia on MRI. Brain MRI was performed because of the patient's neurological symptoms. MRI images showed nodular and punctiform signal abnormalities in several brain regions, including frontal, periventricular, corpus callosum, midbrain and vermis. These signal abnormalities were hyperintense on T2, T2 Flair and diffusion sequences, with diffusion restriction (ADC).

OBSERVATION

Our 21-year-old patient was diagnosed with haemophilia type A at the age of 8. He had a family history of the disease, his maternal uncle also being affected. Over the course of his life, the patient experienced several episodes of joint and muscle haemorrhage, including a right knee haemarthrosis at the age of 8, a left ankle haemarthrosis at the age of 16, and a spontaneous psoas haematoma at the age of 20. To treat these bleeds, the patient received intravenous recombinant factor VIII (Kogenate). Factor VIII levels at the time of these episodes were 21%, 25% and 19% respectively. The dosage of Kogenate varied according to the severity of the bleeding episode, but in all cases it was administered over 10 minutes, over a period of 1 to 7 days. However, three months after the last treatment, the patient began to experience severe headaches, accompanied by paresthesias in the lower limbs. His initial clinical examination revealed normal blood pressure (12/8 mmHg) and factor VIII estimated at 37%. Brain MRI was performed because of the patient's neurological symptoms. MRI images showed nodular and punctiform signal abnormalities in several brain regions, including frontal, periventricular, corpus callosum, midbrain and vermis. These signal abnormalities were hyperintense on T2, T2 Flair and diffusion sequences, with diffusion restriction (ADC). There was no contrast after contrast injection. In addition, MRI revealed minimal tri-ventricular hydrocephalus and intra-ventricular haemorrhage in the occipital horns (Figures 1-4).

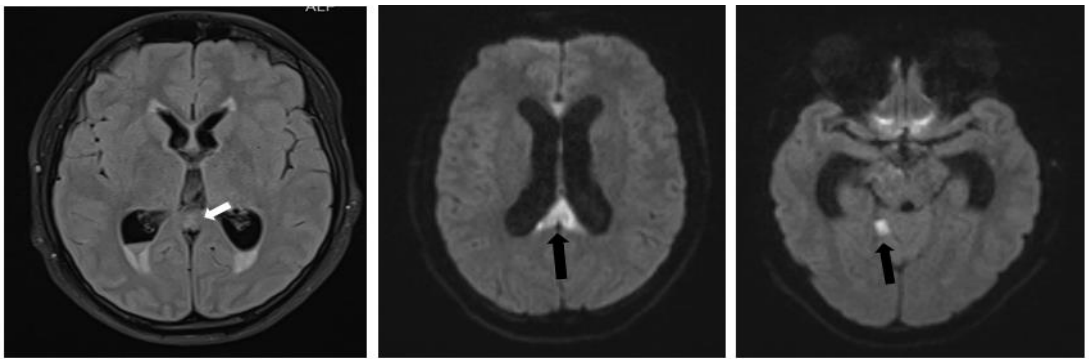

Figure 1: Axial Flair (a) and diffusion sequences (b,c), signal anomaly in the corpus callosum (white arrow), intraventricular haemorrhage (black arrow)

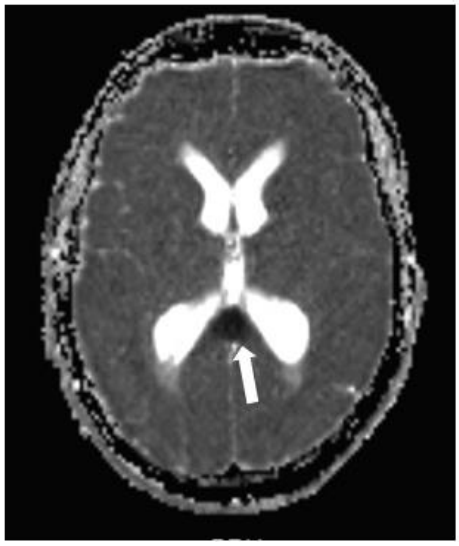

Figure 2: Axial ADC sequence, Corpus callosum signal abnormality without diffusion restriction

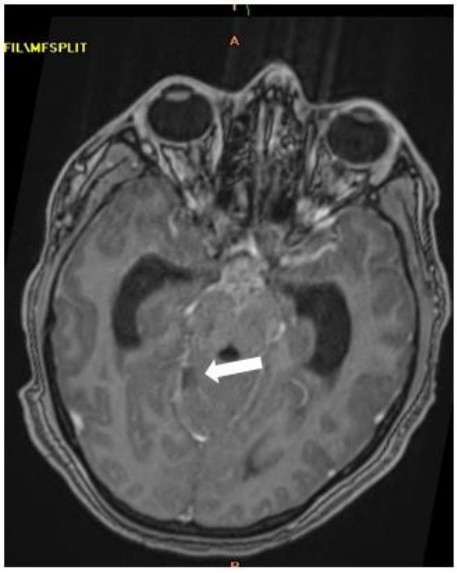

Figure 3: Axial T1 sequence after injection of Gadolenium, no contrast of the signal anomaly in the vermis

DISCUSSION

Cerebral ischaemia secondary to anticoagulant therapy is a rare but serious complication in haemophilia patients. This condition poses a clinical challenge as it conflicts with the general expectation that haemophilia patients have an increased risk of bleeding, rather than thrombosis.

Several potential mechanisms may contribute to cerebral ischaemia in haemophilia patients on anticoagulant therapy, requiring careful evaluation [3, 4].

Coagulation imbalance

A key point to consider is coagulation imbalance in haemophilia patients. When these patients frequently receive recombinant coagulation factors to treat bleeding, an imbalance can occur between the procoagulant and anticoagulant factors in the coagulation system. This imbalance can lead to thrombus formation, even in individuals with a predisposition to haemorrhage. Factor VIII, used in the treatment of haemophilia A, is one of the coagulation factors that can contribute to a pro-coagulant state when administered in excess [5].

Arterial thrombosis

Arterial thrombosis, although rare in haemophilia patients, may occur due to the procoagulant effect of replacement therapy. Arterial thrombosis, including ischaemic stroke, can lead to tissue ischaemia, including in the brain [6].

Vascular complications

Recurrent bleeding into joints and muscles in haemophilia patients can lead to vascular changes, particularly endothelial damage. These vascular changes can be a contributing factor to thrombosis by promoting thrombus formation [7].

Monitoring and management

Careful monitoring of haemophilia patients on replacement therapy is essential, particularly those with near-normal factor VIII levels, as they may be at increased risk of developing thrombotic events. This requires regular assessment of coagulation function and clinical parameters such as blood pressure and neurological symptoms. If cerebral ischaemia is suspected, imaging studies such as MRI are essential to establish an accurate diagnosis [8, 9].

Prevention

Prevention of cerebral ischaemia in haemophilia patients is based on balanced coagulation management, avoiding both excessive bleeding and thrombosis. The dosage of replacement therapy should be adapted to the severity of the bleeding episode, avoiding excessive administration of coagulation factors. An individual assessment of thrombotic risk is also necessary to determine the duration and intensity of anticoagulant treatment [10].

CONCLUSION

Cerebral ischaemia secondary to anticoagulation therapy is a rare but potentially serious complication in haemophilia patients. Understanding the underlying mechanisms and appropriate coagulation management are essential to prevent such complications. Close patient monitoring and individual risk assessment are necessary to balance the benefits and risks of anticoagulant therapy in haemophilia patients.

REFERENCES

1. Leebeek, F. W., Eikenboom, J. C. J., & Castaman, G. (2019). Acquired von Willebrand syndrome in patients with angiodysplasia. *New England Journal of Medicine*, *380*(14), 1372-1374.
2. Mannucci, P. M., Schutgens, R. E. G., & Santagostino, E. (2017). How I treat age-related morbidities in elderly persons with hemophilia. *Blood*, *130*(4), 406-413.
3. Franchini, M., Tagliaferri, A., & Mannucci, P. M. (2010). The management of hemophilia in elderly patients. *Clinical Interventions in Aging*, 5, 101-106.
4. Srivastava, A., Brewer, A. K., Mauser-Bunschoten, E. P., Key, N. S., Kitchen, S., Llinas, A., ... & Treatment Guidelines Working Group The World Federation Of Hemophilia. (2013). Guidelines for the management of hemophilia. *Haemophilia*, *19*(1), e1-e47.
5. Kulkarni, R., Soucie, J. M., & Lusher, J. M. (2007). Sites of initial bleeding episodes, mode of delivery and age of diagnosis in babies with haemophilia diagnosed before the age of 2 years: a report from The Centers for Disease Control and Prevention's (CDC) Universal Data Collection (UDC) project. *Haemophilia*, *13*(4), 380-387.
6. Fischer, K., Astermark, J., & van der Bom, J. G. (2010). Prophylactic treatment for severe hemophilia: comparison of an intermediate-dose to a high-dose regimen. *Blood*, *115*(2), 395-400.
7. Gouw, S. C., Van Der Bom, J. G., Ljung, R., Escuriola, C., Cid, A. R., Claeyssens-Donadel, S., ... & van den Berg, H. M. (2013). Factor VIII products and inhibitor development in severe hemophilia A. *New England Journal of Medicine*, *368*(3), 231-239.
8. Iorio, A., Iserman, E., & Blanchette, V. (2017). Birth cohort effects on the bleeding phenotype in children with severe haemophilia A. *Haemophilia*, *23*(6), 858-864.
9. Chalmers, E. A., Brown, S. A., Keeling, D., Liesner, R., Richards, M., Stirling, D., ... & Paediatric Working Party of UKHCDO. (2007). Early factor VIII exposure and subsequent inhibitor development in children with severe haemophilia A. *Haemophilia*, *13*(2), 149-155.
10. Oldenburg, J., Optenberg, M., & Kurnik, K. (2005). Acquired von Willebrand syndrome in paediatric patients with congenital heart disease. *Thrombosis and Haemostasis*, *93*(3), 481-487.