

Case Report

Thalamic Haemorrhage in Methanol Intoxication: An Autopsy Case Report

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ABSTRACT

Intentional or accidental poisoning of methanol is common as it is used in many daily used chemicals. Manifestation of its toxicity is delayed until oxidation is done by the liver to formaldehyde and formic acid. It mainly affects the central nervous system, especially basal ganglia. This is a case of a person who took methanol accidentally. He developed hyperdensity in the thalamus on CT after 10 days and died two days after that. On post-mortem, there was diffuse haemorrhage in the right thalamus and patchy haemorrhage into the white matter surrounding the left thalamus. This is the first case of post-mortem finding of thalamic haemorrhage in methanol poisoning from India.

Key Words: Thalamic haemorrhage; Methanol; Accidental poisoning; Basal ganglia

INTRODUCTION

Methanol is commonly found in various commercial products such as antifreeze, perfumes, photocopier fluid, as well as in methylated spirit. Poisoning often occurs as a result of accidental or intentional intake. Methanol toxicity is mainly due to formaldehyde and formic acid, formed during its oxidization by the liver. As a result, manifestations of toxicity may be delayed for hours.¹ It mainly affects the central nervous system, especially basal ganglia, causing haemorrhagic and non-haemorrhagic damage to putamen; it also causes ischaemic cell damage of the hippocampus; cystic necrosis of cerebral white matter; and, haemorrhagic necrosis of the thalamus, putamen and globus pallidus.¹ The characteristic lesion of

methanol poisoning is haemorrhagic putaminal necrosis on MRI.²

In this case, there was haemorrhage in the thalamus of a person, who consumed methanol accidentally and survived for 12 days. To the best of this author's knowledge, this is the first postmortem case report of methanol poisoning with thalamic haemorrhage from India.

The Case: A person, who worked as a carpenter in a shop, drank methylated spirit (used as paint thinner) accidentally, mistaking it for water at his workplace. He vomited immediately and washed out his mouth. The next day, he had two or three episodes of vomiting, but otherwise was quite well. On the third day, he started vomiting continuously and became unconscious, for which he was taken to the casualty of All India Institute of Medical Sciences (AIIMS), New Delhi in a gasping state. Treatment was started as per the history of methylated spirit ingestion. On the second day of admission, he developed signs of toxic encephalopathy. After 1 week in the hospital, a CT scan of the brain was done, which showed hyper-density in the thalamus. MRI was advised, but the patient died 2 days later. Cause of death was opined as 'refractory shock/acute kidney injury due to paint thinner poisoning.'

An autopsy was done the next day. Examination revealed most of the internal organs to be congested; lungs were oedematous, and liver was enlarged with fatty changes. About 500 ml straw coloured fluid was present in the peritoneal cavity.

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Brain parenchyma was softened and it was not possible to remove it intact; it was decided to remove the brain in two halves. As dissection was done to remove the upper half, the right thalamic region revealed diffuse haemorrhage in the grey matter and surrounding white matter, while the left thalamic region showed patchy haemorrhage in the surrounding white matter (Fig 1). Both the thalamic regions were removed and dissected. On dissection, the right thalamic region confirmed the presence of diffuse haemorrhage into the grey matter and surrounding white matter (Fig 2). Left thalamic region showed patchy haemorrhage into the surrounding white matter (Fig 3).



Fig 1: Haemorrhage in right thalamic (thick arrow) and left thalamic (thin arrow) regions (*brain dissected in situ*)



Fig 2: Section of right thalamic region showing diffuse haemorrhage into thalamus and surrounding white matter



Fig 3: Left thalamic region showing diffuse haemorrhage into surrounding white matter

DISCUSSION

Methanol poisoning can be accidental as well as intentional. Its toxicity is mainly due to formaldehyde and formic acid formed during the process of oxidation of methanol by the liver and as such, manifestations may take hours to develop.¹ In this case, the person had taken methylated spirit accidentally for water and only on the second day, he developed vomiting and then became unconscious. On the 10th day, his CT scan showed hyperdensity in the thalamus. A study by Bessell-Browne et al on two patients, showed bilateral putaminal low attenuation, but no putaminal or other focal haemorrhages on CT on the 4th day in one of their patients.³ Similarly, in the other patient, cerebral deep white matter showed low attenuation on CT, but no haemorrhage on the 15th day; however, scattered foci of haemorrhage was seen at the grey-white interface of the cerebrum on MRI.

In this case, the brain parenchyma was soft and oedematous, and diffuse haemorrhage was found in the grey matter of right thalamus, as well as surrounding white matter. This finding is comparable to the study of Karayel et al on 17 cases of methanol intoxication.¹ They found moderate cerebral oedema in 8 cases, and haemorrhagic necrosis was seen in the thalamus, putamen and globus pallidus in another 5 cases. McLean et al presented a clinical and pathological study of 2 patients, one of whom survived about one year with residual paralysis and deformity of all the limbs and blindness, while the other patient survived about nine months with residual paralysis of all the limbs and only hand movement perception with the eyes. They found bilateral symmetrical cystic areas of necrosis throughout the subcortical white

matter and symmetric areas of cystic infarction throughout the substances of putamen, but globus pallidus, hypothalamus and thalamus was unremarkable.

There are many causes of non-traumatic thalamic haemorrhage, most common being hypertension. Risk factors include obesity, diabetes mellitus and cardiac diseases.⁵ None of these risk factors were present in this case.

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