

Isolated cerebellar damage caused by carbon monoxide intoxication

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DESCRIPTION

An unconscious 5-year-old girl with convulsions was admitted to emergency department. Her blood carboxyhaemoglobin level was 7.3%. CO intoxication was presumed and she was referred to our department for a brain MRI. In addition to conventional sequences, diffusion-weighted imaging (DWI) was also performed.

Whereas there was no pathological signal change on supratentorial images, symmetrical lesions in the grey matter were observed in both cerebellar hemispheres. MRI showed hypointensities on T1weighted image (figure 1A), hyperintensities both on T2-weighted image (figure 1B) and fluid-attenuated inversion recovery image in these

affected areas. A diffusion-weighted MRI revealed restricted diffusion pattern due to cytotoxic oedema (figure 2A, B) as well. As a result, CO intoxication with isolated cerebellar damage was confirmed as the final diagnosis based on these MRI findings.

CO is a highly toxic gas affecting predominantly the central nervous system. Clinical features of poisoning are generally non-specific and its severity ranges from mild headache to death depending on the concentration of the exposed gas and exposure duration. In CO poisoning, as is in other hypoxic ischaemic central nervous system events, relatively poor vascularisation and 'watershed' areas are more vulnerable and affected earlier.¹ The most sensitive

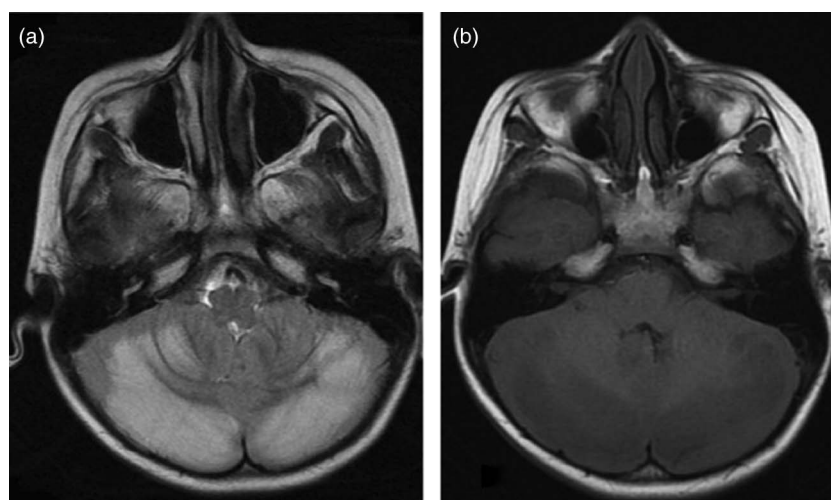


Figure 1 Axial T2-weighted image (A) showing hyperintense and T1WI (B) showing hypointense lesions in grey matter of the both cerebellar hemispheres.

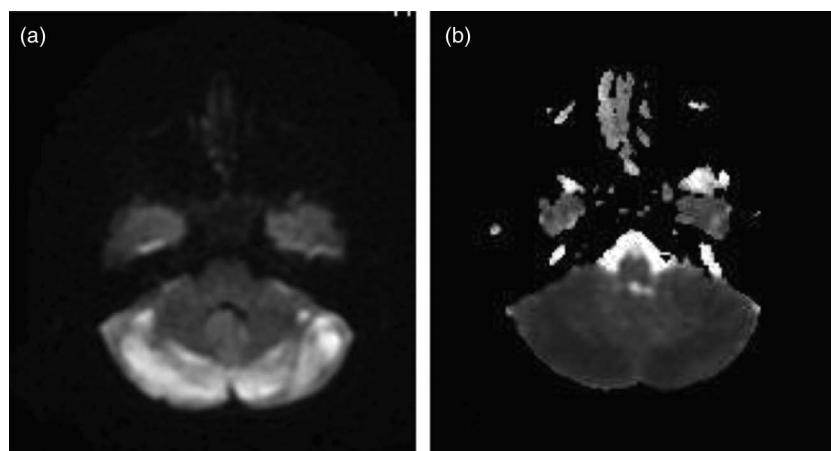


Figure 2 In both cerebellar hemispheres hyperintensity on diffusion-weighted imaging (A) and hypointensity on apparent diffusion coefficient (ADC) mapping (B) compatible with diffusion restriction due to early ischaemia.



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brain regions to hypoxia are the cerebral cortex, white matter, basal ganglia and Purkinje cells in the cerebellum.² The lesions identified in the MRI are commonly located in supratentorial region and cerebellar lesions often coincide with supratentorial ones. However, isolated cerebellar lesions without supratentorial involvement may be the only MRI findings in CO poisoning.

Learning points

- In CO poisoning, as is in other hypoxic ischaemic central nervous system events, relatively poor vascularisation and 'watershed' areas are more vulnerable and affected earlier. The most sensitive brain regions to hypoxia are the cerebral cortex, white matter, basal ganglia and Purkinje cells in the cerebellum.
- In MRI, cerebellar lesions usually coincide with supratentorial ones. However, isolated cerebellar lesions may be the only MRI findings in CO poisoning.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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