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1: Invest Radiol. 2002 Oct;37(10):542-51.

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Neurotoxicity of angiographic carbon dioxide in the cerebral vasculature.

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RATIONALE AND OBJECTIVES: This study was undertaken to resolve conflicting evidence about the neurotoxicity of carbon dioxide gas as an angiographic contrast medium within the cerebral vasculature. MATERIALS AND METHODS: Single intracarotid injections or five consecutive intracarotid injections, at 2-minute intervals, of carbon dioxide, iopromide or saline, were given to 32 rabbits under clinically relevant conditions. Extravasation of Evans blue and Tc-pertechnetate was used to determine blood-brain barrier damage at 30 minutes or 6 hours after injection. At 6 hour after multiple injections, brains were removed for histologic examination. RESULTS: A single intracarotid injection of carbon dioxide caused minimal blood-brain barrier breakdown, whereas multiple injections caused significant breakdown that was still present at 6 hours after the injections. All carbon dioxide-injected brains that underwent histologic examination showed evidence of irreversible brain damage in the injected hemisphere. CONCLUSIONS: This study confirms the neurotoxicity of carbon dioxide within the cerebral vasculature and its unsuitability for clinical use in cerebral angiography.

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