

Case Report

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Accidental Administration of Ionic Contrast Medium through Intrathecal Route

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Abstract

Context: We report a case of generalized clonic contractions that developed after accidental administration of ionic contrast medium through intrathecal route for computed tomography (CT) cisternography. Non-ionic contrast media can be delivered intrathecally, whereas this route is contraindicated for ionic contrast media.

Case details: 31 year-old woman, sodium meglumine ioxitalamate was administered through the intrathecal route, developed convulsions. Eventually she was cured with anticonvulsive agents and supportive treatment.

Discussion: Ionic contrast medium should never be administered intrathecally, or else it may cause a life-threatening neurotoxic reactions.

Keywords: Ionic contrast medium; Generalized clonic contractions

Introduction

Intrathecal administration of ionic contrast media can trigger neurotoxic reactions due to the media's hyperosmolar and ionic properties. We discuss a patient who developed convulsions following accidental administration of ionic contrast medium through intrathecal route. The appropriate management strategies for similar patients are reviewed and the need for careful use of contrast agents is emphasized as part of this case study.

Case Report

A 31 year-old woman (55 kg, 160 cm) presented to ENT (Ear, Nose and Throat) clinic for complaints of water draining from her right nostril for three days, which becoming worse while leaning forward. A CT cisternography was ordered following the initial diagnosis of rhinorrhea. During preparation for the procedure, an ionic contrast medium containing sodium meglumine ioxitalamate (Telebrix-35) was administered, instead of a non-ionic contrast medium, through the intrathecal route. The patient subsequently started presenting clonic contractions, starting from the lower legs and extending to the entire body. Diazepam (5 mg) was given intravenously to no avail. Another 5 mg of diazepam was administered, but convulsions continued and the patient was brought to the intensive care unit with generalized clonic contractions and cyanotic and unconscious presentation. She was administered 400 mg sodium thiopental, was intubated and mechanical ventilation was provided. A thiopental infusion at the rate of 3 mg/kg/hr was initiated to control contractions. An anticonvulsant agent, phenytoin, was also administered at a loading dose of 750 mg. Maintenance infusion of phenytoin at 3x100 mg was also initiated and blood levels of the medication were regularly checked. Hydration was provided by intravenous administration of crystalloid fluids at 10 ml/kg/hr. The patient was observed for 24 hours and thiopental infusion was stopped after no repeat convulsions were noted. The patient regained consciousness about 3 hours after stopping the thiopental infusion and was extubated shortly afterwards, then observed in the ICU for 48 hours before being admitted to the ENT ward. No rhinorrhea was observed at the ENT ward; however, her laboratory findings showed elevated levels of AST, ALT, LDH, CK and CK-MB during the same period. The patient was discharged from the hospital on the 9th day after the administration of the incorrect medication, with minimal amnesia and cognitive dysfunction.

Laboratory results at 15-day and one-month follow-up visits were all within normal limits (Table 1).

Discussion

We presented a case in which an ionic contrast medium was accidentally administered to a patient in order to determine the dural effect rather than the correct non-ionic medium. Clonic convulsions developed following administration of the wrong medium and they were controlled with induced barbiturate coma and anticonvulsant therapy, during which the patient's airway was secured with endotracheal intubation. The observed biochemical values of the patient in the test results were high.

The literature reports on 47 cases of accidental administration of intrathecal ionic contrast medium between 1996 and 2007 [1]. A widely accepted conclusion drawn from these cases is that only non-ionic contrast media can be delivered intrathecally, whereas this route is contraindicated for ionic contrast media.

Non-ionic and water-soluble contrast media are thought to lower the seizure threshold and increase the risk for epileptic convulsions [2]. Mutoh et al. [3] reported two cases in 2010 that developed temporary cortical blindness and generalized convulsions following non-ionic contrast medium administration during saccular aneurysm embolization.

Accidental administration of ionic compounds used for radiological examinations via the intrathecal route can result in severe side effects. Sahjpaul et al. [4] reported a case that was given intrathecal ionic

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Date	AST (7-41 U/L)	ALT (5-50 U/L)	LDH (98-192 U/L)	CK (26-140 U/L)	CK-MB (0-25 U/L)
Feb. 12	21	19	103	59	2.7
Feb. 19	116	70	434	4765	25
Feb. 20	215	79	1336	28880	120
Feb. 21	558	180	2851	>20000	28
Feb. 22	612	220	2220	42120	355
Feb.23	629	271	1480	49080	415
Mar.03	23	32	199	78	5.1

Table 1: Biochemistry panel values of the patient before and after accidental administration of ionic contrast medium on 18 Feb 2010.

contrast medium and subsequently died despite intensive medical therapy.

The abnormal elevation in biochemical parameters of our patient could be caused by the direct cellular toxic effect of the medium as well as apoptosis resulting from ischemia/reperfusion injury.

In conclusion, ionic contrast medium should never be administered intrathecally. Aggressively controlling convulsions, early intubation and aggressive hydration are the cornerstones of treatment to prevent severe outcomes or mortality should ionic contrast media be given intrathecally.

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