Mannitol Osmotherapy in Haemodynamically Stable Head Injury Patients - Risk of Sudden Hypotension - A Case Report

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Introduction

Mannitol is widely used in the neurosurgical settings and generally considered low risk therapy[1]. Its extensive use has established inertness and relative lack of toxicity. Various side effects, such as hyperosmolar status, precipitate reduction in intra cranial pressure, rebound phenomenon and hypervolemia have been described. However, hypotension due to rapid administration has not been widely recognised[2] in neurosurgical patients. Because of the lack of awareness of this side effect, publication of this report was considered worthwhile.

Case Report

A40ycarold female who allegedly hada fail on the right side ofherbody on the road side was brought to the emergency department. There was no other history available; as no informant was accompanying her.

On examination, she was found to be drowsy, with Glasgow coma score of 12/15 and had multiple abrasions on right side of the face. She had fracture shaft of right humerus and a small lxi cm wound on anterior aspect of right thigh which was bleeding. Her pulse rate was 80/min and BP 120/70mmHg. Chest, cardiovascular and abdominal examinations did not reveal any abnormality. She was moving all her limbs except the right arm. After 1/V fluids with I L ringer lactate, she was still found to be drowsy and 20% mannitol, 150 ml was given I/V fast over a period of ten minutes. Repeat examination after mannItol infusion revealed no radial pulse and unrecordable BP. Resuscitation was started and I/V Infusion of 2L of collide was given. Right humerus fracture was immobilized. Her pulse and BP improved. CT scan of head and abdomen were normal. Chest x-ray showed no hemo or pneumothorax. Doppler examination of lower leg showed normal vessels and flow, Hemogram and biochemical parameters were within normal limits. She remained haemodynamically stable after initial episode of hypotension and sensorium improved. She Was discharged next day. On follow-up she is doing well.

Discussion

Mannitol is a 6-carbon alcohol prepared commercially by the reduction of dextrose[3]. It is used clinically as a diuretic. Adverse affects which have been reported are extension of its pharmacologic activity which arc well recognised. Hypotcusion due to rapid adminIstration has not been widely seen[1]. A study conducted by Charles et al[1] on 24 patients having coronary artery surgery, reported that there is a drop in blood pressure and peripheral vascular resistance when Mannitol 25% was given at a rate of 0, 16 g/kg/sec. The degree of drop was proportional to the dose and rate of administration. In animal studies using radiolabelled microspheres it is documented that decrease in blood pressure is because of vasodilatation in the skeletal muscle[4]. The reasons muscle arterioles respond preferentially to osmotic shifts is unclear[4]. But the response may reflect a form ofautoregularion. Change in blood flow to other organ beds were variable and unimportant.

Ourconclusions are that Mannitol results in hypotcnsion if given rapidly. In situations like head injury where blood pressure and cerebral perfusion pressure are to be maintained, we recommend that this drug should not be administered too rapidly and a close watch be kept on arterial pressure during infusion.

References

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