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Original Research Paper

Choice of scolicidal agent in surgery for hydatid cyst disease- Should anaesthetist be concerned?

Anaesthesiology

KEYWORDS: Hydatid cyst of liver, Laproscopy, hypernatremia, Scolicidal agent

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ABSTRACT

Hydatid cyst disease is known for its most dreaded complication of anaphylactic reaction. The anaesthetist is watchful during the perioperative period for any signs and symptoms suggestive of any allergic reaction and is prepared to manage the catastrophe immediately. However scolicidal agent used in the surgery do have important anaesthetic implication in successful management of hydatid cyst disease. Anaesthetist should be aware of the scolicidal agent to be used intraoperatively, so that the related complications can be anticipated and managed if required. We describe the case of 40 year old female posted for laproscopic surgery for hydatid cyst of liver where severe hypernatraemia as a complication of scolicidal agent was timely detected and was successfully managed.

Introduction:

Hydatid cyst is known for its very dreaded complication of anaphylactic reaction in the intraoperative and postoperative period. Scolicidal agent used by the surgeon is often not given due importance in the anaesthetic management of these patients. Variety of scolicidal agents are available and anaesthetist should have knowledge about the scolicidal agent being used intraoperatively and must anticipate the associated complications. Hypernatraemia is a complication which might occur in the intraoperative or postoperative period if hypertonic saline is used as scolicidal agent in higher concentration and disproportionate quatity. Surgeon and anaesthetist should work as a team; any lack in communication between them could result in significant morbidity and mortality.

Case report:

Forty year old female presented with complaint of abdominal pain in right upper abdomen since 1 month. The USG report was suggestive of single hydatid cyst measuring 10x12x8 cm in right lobe of liver. During the preanaesthetic check-up, patient was diagnosed with diabetes mellitus which was well controlled on oral hypoglycaemic agents. Blood investigations were within normal limits and chest x-ray ruled out any daughter hydatid cyst in lung. The patient was given ASA-I physical status for anaesthesia. Patient was kept NPO as standard ASA guidelines. Patient was premedicated with tablet alprazolam 0.5 mg on the night before surgery. Blood grouping and cross matching done, availability of adequate blood and blood products was ensured on the day of surgery. Morning dose of oral hypoglycaemic agent was omitted and fasting blood sugar on the day of surgery was normal. Patient was shifted inside the operation theatre and standard ASA monitors were attached. 18G IV cannula was secured over dorsum of right hand and ringer lactate was started. Patient was premedicated with Inj.Midazolam 0.02mg/kg IV and Inj. Fentanyl 2mcg/kg IV. Patient induced with Inj. Propofol 1-2mg/kg IV and after check ventilation Inj. Vecuronium 0.1mg/kg IV given. After 3 minutes patient intubated with ET tube No.7 and maintained on oxygen, air and sevoflurane with Inj.Vecuronium given intermittently based on TOF count. Patient was covered with warming blanket and nasopharyngeal temperature probe was placed for temperature monitoring. Intraoperative blood sugars were maintained between 120-180 mg/dl. However, when fifteen minutes had elapsed from the time of initiation of irrigation of cyst with scolicidal agent, 5-6 atrial premature contractions per minute were observed on cardioscope which subsequently decreased to 1-2 atrial premature contractions every 1 minute once the depth of anaesthesia and hydration were ensured. The surgery lasted for 3 hours. There was no untoward event recorded at the time of cyst excision. At the end of the surgery, patient was reversed with Inj. Neostigmine 0.05 mg/kg IV and Inj.Glycopyrolate 0.01mg/kg IV. Following extubation patient was drowsy, was following verbal commands with adequate muscle tone clinically and on neuromuscular monitoring and so was shifted to PACU for observation. In PACU patient received supplemental oxygen at 4L/min with continuous haemodynamic and pulse oximeter monitoring. After one hour of observation in PACU, patient became irritable and agitated. Patient was not following verbal commands. HR was 136/min with 1-2 APC's/min, BP-120/80 mm Hg and saturation was 98% on 28% fiO2. Immediately patient was given 100% oxygen and Inj.Mizazolam 2 mg IV. Subsequently over a period of 5 minutes, the patient became calm with adequate spontaneous respiration. Immediately blood sample for ABG, serum electrolytes and blood sugar were drawn. Patient was put on facemask with reservoir bag. The ABG report and blood sugar level were normal. Serum electrolyte report showed serum sodium to be 174 mEq/L. The surgeon was informed about the event and on discussion surgeon informed about the use of 3 litres of 20% Inj. Sodium chloride solution as scolicidal agent unlike injection cetrimide which is rountinely used in our set up and its substitution with hypertonic saline was not brought to the notice of the periopertive anaesthetist. Right side subclavian vein was cannulated for CVP monitoring. CT scan head was done and was found to be normal. Patient was shifted to ICU for monitoring and management of hypernatremia. On 1st postoperative day, serum sodium decreased to 164 mEq/L and patient became oriented to time, place and person. She was shifted to step down ICU and was discharged from the hospital after 5 days of stay with no further complications.

Discussion

There have been literature published in the past where hypernatremia has been documented as a fatal complication wherein hypertonic saline was used as scolicidal agent. However in the previous case reports, the anaesthetist was aware of the use of hypertonic saline as the scolicidal agent and hence severe hypernatremia was anticipated complication. Contrary to the other case reports, the anaesthetist in-charge was unaware of the use of hypertonic saline as scolicidal agent. Hydatid disease is caused by echinococus granulosus. Hydatid cyst can either present as acute abdominal pain or may be detected accidently in ultrasonography. Surgery remains the treatment of choice where the entire cyst is excised intact. Other ways of treatment includes the use of various scolicidal agents into the cyst which kills the parasite and prevent cyst enlargement or development of any new cyst in the organ. Various scolicidal agents are available like formalin, cetrimide, hypertonic saline, hydrogen peroxide, silver nitrate, povidione iodine. hypertonic saline can be absorbed into systemic circulation by following ways:

1)absoption from the cyst wall
2)absorption from the peritoneum
3)inadvertent invascular injection

In our case, hypernatremia may have resulted from absorption of hypertonic saline through cysts walls and from exchange of both salt

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and water through the peritoneal membrane. Moreover, an inadvertent injection of hypertonic saline into a blood vessel cannot be excluded. The mechanism of hypernatremia after a hypertonic saline injection involves both a total body sodium gain and a free water loss.[6]

Hypertonic saline when absorbed in large amounts into systemic circulation, may precipitate as acute hypernatremia. Acute hypernatremia can cause various neurological symptoms namely:

1)acute hypernatremia causes increase in the plasma osmotic pressure which causes shrinkage of the brain cells, resulting in subarachoid haemorrhage
2)brain demyelinating lesions
3)cerebral oedema

hypernatremia there by can result in various neurological deficits and the sequelae of which can be life threatening to the patient. Acute hypernatremia can be treated by following ways

a)diuresis
b)intraperitoneal dailysis
c)haemodialysis

This case highlights the importance of communication between the surgeon and anaesthetist. Intraoperatively patient presented with atrial premature contractions which persisted inspite adequate depth of anaesthesia and were possibly an indication towards the rising serum sodium levels. This case brings into notice the importance of the choice of scolicidal agent and its adverse effects. This morbidity could have been prevented had there been adequate communication between anaesthetist and surgeon. It also points towards the need for anaesthetist to be vigilant perioperatively. In this case it was the indiscrimate use of hypertonic saline as scolicidal agent, without notice of anaesthetist, resulting in severe hypernatremia which was successfully managed without any further complications.

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