Egyptian Journal of Anaesthesia (2016) 32, 443–446

HOSTED BY

Egyptian Society of Anesthesiologists

Egyptian Journal of Anaesthesia

www.elsevier.com/locate/egja
www.sciencedirect.com

Case report

Combined hyponatremia and hypocalcemia after intravascular absorption of 1.5% glycine during operative hysteroscopy. A case report

Sherif S. Sultan *

International Medical Center (IMC), P.O. Box 2172, Jeddah 21451, Saudi Arabia
Department of Anesthesia, Intensive Care and Pain Medicine, Faculty of Medicine, Ain Shams University, Cairo, Egypt

Received 9 December 2015; accepted 23 March 2016
Available online 28 April 2016

KEYWORDS

Glycine;
Hypocalcemia;
Hyponatremia;
Intravascular absorption;
Operative hysteroscopy

Abstract Intravascular absorption of distending media may complicate operative hysteroscopy. Consequences differ according to type, amount and speed of absorption of the distending media. We report a case of intravascular absorption of more than one liter of 1.5% glycine. A 36 years old female developed metabolic acidosis, hyponatremia and hypocalcemia during operative hysteroscopy scheduled for resection of a uterine fibroid. Serum sodium reached down to 119 mmol/l and ionized calcium to 0.898 mmol/l. Serial estimations of arterial blood gases and serum electrolytes were followed. Management was successful in preventing serious side effects. Meticulous monitoring of distending media input/output balance remains the cornerstone in prevention of intravascular absorption.

1. Introduction

Operative hysteroscopy is widely used as a diagnostic and therapeutic tool for a variety of intrauterine pathological conditions. Absorption of distending media during performance of hysteroscopies is possible and consequences differ according to type, amount and speed of absorption of the distending media. Electrolyte-free media e.g. 1.5% glycine is preferred as a distending media when resection of a uterine fibroid is planned via monopolar resectoscope.

We report a case of intravascular absorption of more than 1000 ml of 1.5% glycine during operative hysteroscopy under spinal anesthesia and its management until full recovery of the patient.

2. Case report

The case involved a 36 years old lady (weight: 67 kg, height: 157 cm) scheduled for operative hysteroscopy. History included repeated vaginal bleeding, anemia, and delayed fertility suspected to be secondary to uterine fibroid diagnosed by hysterosalpingogram. During her visit to the anesthesia clinic, her heart rate (HR) was 80 bpm and blood pressure (BP) was 85/55 mmHg. Preoperative laboratory work-up included complete blood count (Table 1; Pre-op) and a normal bleeding

* Address: 24 Muhammad Al-Maqreef St. Nasr City, Cairo, Egypt. Tel.: +20 1128448448.
E-mail address: sherif_sultan@yahoo.com.
Peer review under responsibility of Egyptian Society of Anesthesiologists.

http://dx.doi.org/10.1016/j.egja.2016.03.001

Table 1 Perioperative laboratory and serial arterial blood gases (ABG) and electrolytes performed for the patient.

	Pre-op	ABG1	ABG2	ABG3	ABG4	ABG5	Post-op
Hemoglobin (gm/dl)	9.1	8.1	8.6	9.3	9.0	8.8	9.2
Hematocrit (%)	29.8	33.7	35.3	36.7	36.2	35.0	30
Platelets (count)	273						256
pH		7.299	7.389	7.423	7.425	7.434	
pCO_2 (mmHg)		42.7	32.8	34.3	36.1	34.0	
pO_2 (mmHg)		72.8	131.4	100.8	97.9	102.1	
HCO_3 (mmol/L)		20.5	19.4	21.9	32.2	22.2	
BE (mmol/L)		−5.9	−5.0	−2.1	−1.0	−1.6	
Sodium (mmol/L)		119.8	128.2	134.0	132.9	133.2	137
Potassium (mmol/L)		3.55	3.44	3.07	2.81	3.47	3.8
Calcium (mmol/L)		1.000	0.898	0.919	0.873	1.086	
Chloride (mmol/L)		97.0	97.2	98.2	98.6	98.6	101

Preoperative (Pre-op), ABG (arterial blood gases), Postoperative (Post-op).

profile. She was classified as American Society of Anesthesiologists (ASA) II and was convinced with spinal anesthesia.

On the day of the procedure, the patient was admitted to the day-procedure unit where no intravenous (IV) fluids were started. Due to busy operating room (OR) schedule, the procedure was delayed for few hours. When the patient was shifted to OR, she had been completed 14 h fasting. She was attached to standard monitors. Her HR was 84 bpm and BP was 148/68 which decreased to 108/62 mmHg after premedication with 2 mg midazolam IV. The patient was preloaded with hydroxyethyl starch (HES) 130/4 solution (Voluven, Fresenius Kabi, Hamburg, Germany) while spinal anesthesia was induced with heavy bupivacaine 0.5%, 12 mg intrathecally in the sitting position. Propofol 1% IV infusion was started in a rate of 15 ml/h and 6 l/m of oxygen was applied via a face mask. Heart rate ranged between 58 and 64 bpm and BP between 85 and 98/48 and 62 mmHg.

Patient was positioned in the lithotomy position while the upper body was covered with pre-warmed cotton blankets. Then the operative site was cleaned and draped and the procedure started. A Karl Storz (Tuttlingen, Germany) hysteroscope was used during the procedure. Input and output of distending media were monitored. Distending media was 1.5% Glycine solution as an electrolyte-free isotonic solution suitable for monopolar resectoscope. The intrauterine pressure was controlled by a pressure-controlled suction/irrigation pump (Hamou Endomat, Karl Storz, Tuttlingen, Germany). Output of the distending media was collected in one canister via triple-way suction: directly from the hysteroscope, from the floor via a floor-suction device and what was collected in a bin just below the hysteroscope. Due to difficulty to calculate the remaining volume in a glycine bag, the protocol was to estimate distending media input/output balance after consuming each glycine bag.

Diagnosis of a large (7.5 × 7.5 cm) uterine fibroid was confirmed utilizing an intrauterine pressure of 100 mmHg and a 3-L glycine bag. When resection of the fibroid started, intrauterine pressure was increased to 200 mmHg. First 3-L glycine bag was consumed in 32 min and the balance was insignificant. Second 3-L bag was consumed in 15 min with a balance of −800 to −900 ml. However, the calculation was not certain due to soaked floor, drapes and gowns. The patient was hemodynamically stable with HR: 75 bpm and BP: 95/54 mmHg. Furosemide 10 mg was given IV and IV fluid was restricted and the procedure continued. It was noted that time that the airway was partially obstructed. Therefore, a nasopharyngeal airway was inserted and IV sedation was lightened. A 2-L glycine bag was employed instead of 3-L bag and after 18 min it was consumed leaving a confirmed balance of more than one liter loss (−1000 to −1200 ml). The procedure was terminated, IV fluids were stopped and sedation was terminated. A urinary catheter and a uterine catheter were inserted. Total IV fluids given at that moment were 1 l (the second bag was lactated ringer's solution). An arterial sample was taken for arterial blood gases (ABG) and electrolytes analysis. The results came with metabolic acidosis, respiratory acidosis, hyponatremia (Na: 119.8 mmol/l) and hypocalcemia (ionized Ca: 1.00 mmol/l) (Table 1, ABG1). Another 30 mg of furosemide was given IV and an arterial line was inserted. The patient was kept in OR for the possibility of airway intervention or hemodynamic resuscitation. The patient was allowed to awaken gradually. Auscultation of the chest revealed no crackles. Neurologically she had no deficit although she remained confused for short period. The patient was hypothermic with core (tympanic) temperature of 35.5 °C. Active warming with forced-air warming system (Bair-Hugger, Arizant Healthcare Inc., MN, USA) at 43 °C started. Hypothermia was attributed to poor control of room temperature, weak warming of the patient depending on pre-warmed cotton blankets and the use of large volume (8 l) of distending media in room temperature.

Afterward, an ABG and electrolytes sample was sent every hour. Results of the 2nd sample came with Na of 128 mmol/l and ionized Ca of 0.898 mmol/l (Table 1, ABG2). Temperature increased to 36.1 °C with hemodynamic stability; therefore, the patient was shifted to post-anesthesia care unit (PACU) where active warming continued. The patient developed nausea that was treated with ondansetron 4 mg IV. Hypocalcemia was treated with 1 g of calcium chloride slowly infused over 30 min.

Results of 3rd ABG and electrolytes sample came with Na of 134.0 mmol/l (Table 1, ABG3). With urine volume of about 3000 ml, IV fluids (Normal saline) were restarted in a rate of 110 ml/h. The 4th ABG revealed hypokalemia (K: 2.8 mmol/l) and was treated with 20 meq of KCl infused over 30 min