Otorrhagia and Nosebleed as first signs of Intravascular Absorption Syndrome During Hysteroscopy: From Bench to Bedside.

Giacobbe V,[1] Rossetti D,[2] Vitale SG,[1] Rapisarda AMC,[3] Padula F,[4] Laganà AS,[1] PalmaraVI[1]

[1]Department of Human Pathology in Adulthood and Childhood "G. Barresi", University of Messina, Messina, Italy.

[2]Department of Maternal and Child Health, Gavardo Hospital, Brescia, Italy.

[3]Department of General Surgery and Medical Surgical Specialties, University of Catania, Italy.

[4]Department of Prenatal Diagnosis, Altamedica Fetal Maternal Medical Center, Rome, Italy.

Corresponding Author

Salvatore Giovanni Vitale

Department of Human Pathology in Adulthood and Childhood "G. Barresi", University of Messina, Messina, Italy.

E-mail: vitalesalvatore@hotmail.com

Citation

Giacobbe V, Rossetti D, Vitale SG, Rapisarda AMC, Padula F, Laganà AS et al. Otorrhagia and nosebleed as first signs of intravascular absorption syndrome during hysteroscopy: from bench to bedside. *Kathmandu Univ Med J* 2016;53(1):87-9.

ABSTRACT

Hysteroscopic surgery is indicated for the treatment of several intrauterine diseases. The surgeon needs to be aware of, and know how to prevent, possible complications related to these procedures. In the case of operative hysteroscopy, the systemic effects of low-viscosity fluid uptake must be considered in order to prevent the complications in the patient. We report on two unusual clinical signs of intravascular absorption syndrome (IAS) that developed during an operative hysteroscopy with glycine 1.5% as the fluid of distension. Based on our experience, we recommend that practitioners reduce operating times, monitor fluid balances, check electrolytes and kinetic heart rates, and monitor for symptoms including otorrhagia and nosebleed, in order to identify and possibly prevent IAS due to an overload of low-viscosity fluids.

KEY WORDS

Glycine, hysteroscopy, intravascular absorption syndrome, nosebleed, otorrhagia

INTRODUCTION

Modern endoscopic surgery has radically changed the treatment of the uterine diseases. The main uterine pathologies eligible for operative hysteroscopic surgery are endometrial polyps, endometrial hyperplasia, endometrial cancer, müllerian malformations, uterine synechiae, intracavitary myomas, and the retention of intrauterine devices.[1]

In modern operative hysteroscopy, the use of saline fluids is preferred over low-viscosity fluids such as sorbitol-mannitol or glycine in order to avoid complications. Bipolar instruments that use saline solutions are preferred, where possible, over monopolar devices that use low-viscosity solutions. Unfortunately the high cost of bipolar devices makes them unaffordable for many centers, and therefore monopolar instruments are still widely used. The low viscosity of sorbitol-mannitol and glycine may underlie the high risk of diffusion and consequent hemodilution (intravascular absorption syndrome, IAS).[2]

The following case report describes two unusual clinical signs of IAS that developed during an operative hysteroscopy with glycine 1.5% as the fluid of distension.

CASE REPORTS

A 67-year-old woman underwent hysteroscopic myomectomy at the Unit of Gynecology and Obstetrics, Department of Human Pathology in Adulthood and Childhood "G. Barresi", University of Messina (Italy). This case report is in accordance with the Helsinki Declaration, Committee on Publication Ethics (COPE) guidelines, Uniform

requirements for manuscripts submitted to Biomedical Journals, the consensus-based clinical Case Reporting (CARE) guideline available through the EQUATOR network and was approved by an independent Institutional Review Board (IRB). As a standard protocol of the university hospital in which the case was reported, the patient was informed at admission and signed an informed consent allowing data collection for research purposes. Her personal history did not disclose any particular diseases. The procedure was performed using a monopolar 10 mm device with glycine 1.5% as the distension fluid. A submucosal 3 cm myoma was completely removed from the anterior wall of the uterus. The length of the operation was 25 minutes and required about 3 litres of solution. The fluid balance at the end of the procedure showed a retention of 2 litres of solution. At the conclusion of the surgery, the patient presented bilateral othorragia and nosebleed. A sudden increase in blood pressure was detected. The blood tests showed hyponatremia (106 mmol/L) that was gradually corrected with the administration of 1500 ml/24 h hypertonic solution of sodium-chloride (134.6 mmol/L). As shown in Table 1, 24 hours after surgery, potassium also reached a normal value (4.41 mmol/L). The hemodilution due to the IAS also caused a decrease in the hematic values of phosphorus and magnesium (data not shown). The first returned to a normal value 12 hours after the operation, while the latter returned to a normal value after about 24 hours. Intraoperative cardiac monitoring showed a sinus rhythm with an heart rate of 82 bpm, an enlargement of the left atrium, one supraventricular ectopic beat, one ventricular ectopic beat, and non-specific disorders of the ventricular repolarization. No specific therapy was necessary, except for the administration of a sodium-chloride solution. During the first 24 hours, the patient experienced sleepiness, torpidity and asthenia, which are all connected to IAS. The patient underwent a new cardiological, neurological, and otolaryngoiatric check-up after 48 hours and did not present any pathological outcomes. After six months, a follow up was performed, and the patient underwent a cerebral magnetic resonance imaging that did not show any type of demyelination damage.

Table 1. Sodium (Na+) and Potassium (K+) values during and after operative hysteroscopy. Values are expressed in mmol/L.

	During surgery	2 hours later	4 hours later	8 hours later	12 hours later	24 hours later
Na+	106	114,4	121,5	126,2	134,6	136,6
K+	2,58	2,77	3	3,31	3,34	4,41

DISCUSSION

HHysteroscopy is widely considered the gold standard for the minimally invasive diagnosis and treatment of several intrauterine diseases.[3-5] Accumulating evidence suggests that hysteroscopic surgery using a bipolar device avoids serious complications related to the intravasation syndrome.[2] This syndrome is characterized by hyponatremia, with consequent headache, sleepiness, scotomas, restlessness, and nausea. Moreover, in several cases neurological damage may occur as a result of the decrease in circulating electrolytes and hyperammonemia caused by the rapid metabolism of glycine. In severe cases, pulmonary edema, hypertension, respiratory arrest, and death may occur.[6] These complications are directly related to three essential elements: the type and the time of surgery, the intrauterine irrigation pressure, and the fluid balance infusion.[7] Considering these elements, hysteroscopic procedures such as myomectomy or endometrial ablation are at higher risk of IAS compared to procedures as polypectomy or endometrial biopsy.[8]

The high cost of bipolar devices may lead to a low implementation in clinical practice, especially in developing countries and in low-volume surgical centers. For this reason, in many hospitals, operative hysteroscopy is performed with monopolar devices and low-viscosity fluids, such as sorbitol-mannitol or glycine as distension fluids. Our experience showed that the distension of the uterine cavity by glycine 1.5% must be accurately monitored, since the passage of the distension fluid into circulation can result in serious consequences for the cardiovascular and neurological systems.[6] The best way to avoid these complications is to accurately evaluate fluid balances during and after the entire procedure.[7] The length of time of the operation is a very important factor in order to avoid complications because long procedures may also require a greater amount of distension fluid. During hysteroscopic surgery, pressure must not exceed 80 mmHg and should be monitored by modern electronic pumps, which are more accurate than the old manual bag squeezer.[9] In our report, we described two unusual symptoms such as otorrhagia and nosebleed connected to the circulatory overload caused by IAS. These symptoms did not leave any type of long-term damage to the patient's oto-vestibular system. Moreover, the otorrhagia and nosebleed totally disappeared 24 hours after the surgery. As is common during IAS, the patient showed a blood decrease of sodium and potassium concentrations, which returned to homeostasis after the administration of a sodium-chloride hypertonic solution (1500 ml/24 h). The patient was discharged 48 hours after the surgery.

CONCLUSION

Based on our experience, we recommend that practitioners reduce operating times, monitor fluid balances, check electrolytes and kinetic heart rates, and monitor for symptoms including otorrhagia and nosebleed, in order to identify and possibly prevent intravascular absorption syndrome due to the overload of low-viscosity fluids.

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