

# Glycine induced acute transient postoperative visual loss

## INTRODUCTION

Hysteroscopic surgeries, which require use of irrigating fluids like glycine can rarely be associated with significant complications.<sup>[1,2]</sup> We report a case of transient postoperative blindness following use of large quantities of glycine delivered through a rotatory pump set at an inappropriately high pressure.

## CASE REPORT

A 27-year-old nulliparous female patient, American Society of Anesthesiologists grade I physical status with a history of menorrhagia and severe progressive dysmenorrhea, resistant to medical management, was scheduled for a hysteroscopic myomectomy under general anaesthesia, after ultrasound study revealed multiple submucous fibroids. Routine preoperative blood investigations were normal. Premedication included intramuscular glycopyrrolate 0.2 mg given half an hour before surgery, intravenous ranitidine 50 mg and intravenous ondansetron 4 mg. Anaesthesia was induced with intravenous thiopentone 250 mg, intravenous fentanyl 100 µg and intravenous atracurium 25 mg. After endotracheal intubation, 60% nitrous oxide in oxygen and isoflurane 0.8–1% was used for maintenance of anaesthesia with controlled ventilation. A 22F Karl Storz™ (Germany) resectoscope was used for hysteroscopy. To facilitate distension of the uterine cavity and better visualization during hysteroscopy, glycine 1.5% was infused at 200 mmHg pressure through the side port of Karl Storz endomat roller pump. 33 L glycine was infused and the outflow container collected 27 L. The procedure lasted for approximately 40 min. Haemodynamic parameters stayed within 20% of baseline values throughout the procedure. Neuromuscular blockade was reversed and the patient had an uneventful recovery from anaesthesia. On awakening, the patient complained of visual loss which was initially attributed to either residual effects of anaesthetic agents or the eye ointment. An hour after recovery in the postanesthesia care unit (PACU), she was fully awake but complained of nausea, vomiting and had complete bilateral blindness. There were no other neurological deficits. On ophthalmic examination,

the patient had normal eye movements, no light perception, mildly dilated pupils, normal intraocular pressures and absent direct and indirect light reflexes. Fundal examination revealed normal vasculature with no signs of the optic disc or macular oedema. A presumptive clinical diagnosis of glycine toxicity was made, and the patient was reassured that the blindness was a transient phenomenon.

In the PACU, serum electrolytes, osmolality, urea, glucose, and ammonia were checked an hour after the procedure. Serum osmolality (282 mOsm/kg), serum potassium (4.3 mmol/L) and glucose were within normal limits. Serum ammonia was 137 µg/dl (reference range 27–102 µg/dl) and serum sodium was 127 mmol/L. Serum creatinine, liver function tests and blood urea nitrogen were within normal limits. 8 h after the procedure, serum ammonia was 234 µg/dl, serum sodium was 130 mmol/L and serum potassium was 2.3 mmol/L. Her vision showed signs of improvement and returned to normal within 20 h of the procedure. Serum ammonia level, checked 26 h after the procedure, was normal (52 µg/dl). Her remaining hospital stay was uneventful. She was discharged on the 3<sup>rd</sup> day after the surgery.

## DISCUSSION

Glycine, a low-viscosity fluid, is favoured for uterine distension during hysteroscopies for its good optical image, poor electrical conduction, and minimal haemolysis.<sup>[3]</sup> Visual disturbances correlate with plasma glycine concentration of 5–8 mmol/L when glycine, an inhibitory neurotransmitter in the retina, slows down the transmission of impulses from the retina to the cerebral cortex resulting in prolonged visual evoked potentials and absent oscillatory potentials on the electroretinogram.<sup>[4,5]</sup> Transient blindness, which resolves within 24 h, following glycine absorption, has been reported.<sup>[6]</sup> Though blood ammonia (an intermediate product in glycine metabolism) concentration of more than 100 µmol/L (normal range 10–35) is associated with neurological symptoms,<sup>[7]</sup> inter-individual variability is great and patients may show neurological symptoms with normal blood ammonia concentration after absorbing large amounts of 1.5% glycine. There is a vague correlation between hyperammonaemia and visual disturbances.<sup>[8]</sup> There have been reports of transient blindness with high levels of ammonia after hysteroscopy, one case of temporary complete blindness, and several cases

where visual acuity was temporarily reduced to perception of light after transurethral resection of prostate using glycine as the irrigation fluid.<sup>[9]</sup> In our patient, the increase in blood ammonia level corresponded with the period of blindness. For a better view, gynaecologists prefer a well-distended uterus. In our case, this was achieved by increasing the pressure (200 mmHg) to infuse glycine, which was higher than the safe standards suggested by Vulgaropulos *et al.*<sup>[10]</sup> (35–75 mmHg) which would have contributed to rapid absorption resulting in toxicity.

## CONCLUSION

Large quantities of glycine, when used under higher than recommended pressures can result in excessive absorption and toxicity. With the increasing numbers of hysteroscopic procedures performed on a more routine basis, a more judicious use of irrigating solutions like glycine is necessary to avoid complications.

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