

Interwoven Causes of Post Operative Ileus in The Context of Preeclampsia with Severe Features: A Case Report

Forchap Nkemanjong Milton^{1,2,3*} | Elong Felix adolf^{1,2} | Nzometia Crysantus Yimlefack^{1,2} | Ndzingu Aza Daniella^{1,2} | Ajabmoh Elvis Nkengasong^{1,2} | Ngie Clara Mbapeh^{1,2} | Nana Njamen Theophile^{1,3}

***Correspondence:** Forchap Nkemanjong Milton

Address: ¹Department of Obstetrics/Gynaecology, Faculty of Health Sciences, University of Buea; ²Department of Obstetrics and Gynaecology, Buea Regional Hospital, Buea, Cameroon; ³Department of Obstetrics & Gynaecology, Douala General Hospital, Douala, Cameroon

E-mail ✉: mforchap@gmail.com

Received: 04 October 2025; **Accepted:** 13 October 2025

Copyright: © 2025 Milton FN. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided that the original work is properly cited.

ABSTRACT

Hypermagnesemia is a rare cause of post operative ileus. Hyponatremia, Hypochloremia, and severe Hypoalbuminemia alone will not cause ileus, but when combine, may prolong the duration of the ileus of another etiology. We present the case of a 49 years old G1P0, dichorionic diamniotic twin pregnancy at 35 weeks' gestation following IVF, complicated by preeclampsia with severe features; severely elevated blood pressure, epigastric pains and CNS prodromal symptoms (severe headache and blurred vision). She underwent an emergency Cesarean section indicated for a persistently elevated severe range blood pressure measurements, despite receiving more than two antihypertensives, in the context of CNS prodromal symptoms of severe headache and blurred vision. She received a loading dose of 14g Magnesium sulphate prior to surgery. Her 2nd to 6th post-operative days were marked by an adynamic intestinal obstruction from hypermagnesemia, prolonged by severe hypoproteinemia, hyponatremia and hypochloremia. There was an associated haemorrhage at the surgical site, due to increased intra-abdominal pressure from the obstruction coupled with the severely elevated blood pressure. This case report reiterates the importance of evaluating the maternal serum magnesium prior to the administration of magnesium sulphate and secondly the role of very low maternal serum albumin levels in prolonging post operative ileus, especially in the context of Preeclampsia in Obstetrics.

Keywords: Hypermagnesemia, Hypoalbuminemia, Post Op Ileus (POI), Preeclampsia

Introduction

Hypermagnesemia is a rare cause of post operative ileus, with only about 4 cases reported in literature, especially in adults with normal renal function. The diagnosis is often made after excluding other well-known causes, such as hypokalemia, prolonged surgery (Al-Shoha *et al.*, 2015; Birrer *et al.*, 2002). In

obstetrics, hypermagnesemia is a feared complication following the administration of magnesium sulphate, to prevent seizures in the context of preeclampsia (ACOG Practice Bulletin, 2020). In resource poor settings, the loading dose of 14g is recommended, thereby increasing the risk of hypermagnesemia, coupled to the fact that the maternal serum magnesium are not often verified prior to its administration (Gordon *et al.*, 2014).

Amongst women with preeclampsia with severe features, severe hypoproteinemia alone is significantly associated preterm birth, fetal growth restriction, and neonatal intensive care unit (NICU) admission (Chen *et al.*, 2016). Though the association between low preoperative albumin and post-operative ileus (POI) has not been fully studied in obstetrics, in general surgery it is an independent predictor of prolonged POI (Liang *et al.*, 2020). Albumin administration improves organ function in hypoalbuminemic critically ill patients (Dubois *et al.*, 2006).

Hyponatremia, Hypochloremia and ascites have been reported several times in the literature of preeclampsia independently, with about two cases reporting concomitant ascites and hyponatremia in the context of preeclampsia. The proposed hypothesis is that the hypoalbuminemia in preeclampsia is nephrotic syndrome range proteinuria, which may be the contributing factor to the hyponatremia and ascites (Ghazali and Al-Domyati, 2019).

Case Presentation

A 49-year-old G1P0, blood group O (+), dichorionic diamniotic twin pregnancy admitted at 35 weeks of gestation following IVF, complicated by preeclampsia with severe features; severely elevated blood pressure, epigastric pains and CNS prodromal symptoms of eclampsia (severe headache and blurred vision). Her Antenatal history was remarkable for a hospitalization at 30 weeks for preterm labour, where lung maturation was done. There was no fever, no labour like pains, no gush of fluid per vagina, no vaginal bleeding. She reported reduced fetal movements. On examination she was alert with an ill looking appearance, labored breathing, and a puffy face with a generalized fluid infiltration of abdominal skin and lower limbs. Conjunctivae were pink, sclerae anicteric. Her blood pressure was 196/115 mmHg, Pulse 109 beats/minute. Abdominal exam revealed a gravid uterus with a twin pregnancy with normal fetal heart rates, the first twin being in cephalic presentation. She also had epigastric tenderness with clinical evidence of ascites. Her urine dipstick revealed 3+ proteinuria. Her Bishop's score was 4/13. She underwent an emergency caesarean section. The intraoperative findings revealed ascites estimated at 1.5 L, a clear liquor and a viable dichorionic diamniotic twin intrauterine pregnancy. The first baby was in cephalic presentation, male, with an APGAR of 8/10, 10/10, and weighed 2.1 kg. The second baby was in complete

breech, female, with an APGAR of 8/10, 8/10, and weighed 1.2 kg. Both placentae were normally inserted at the fundus. The surgery lasted for 40 minutes, with an estimated blood loss of 400cc. The neonates were transferred immediately to the neonatology unit. Her immediate post-operative period was uneventful in the ICU. She began oral sips and ambulation after 12 hours and 24 hours respectively. On post-operative day 2, she began having generalized abdominal distention and constipation, but no fever, no abdominal pains, and no vomiting. The following day was marked by increased abdominal distention, absolute constipation, absent bowel sounds on auscultation, and active bleeding from surgical site (Fig. 1). A nasogastric tube placed collected gas, with < 30 cc of clear fluid (Fig. 2). A clinical diagnosis of post-operative ileus was made. The laboratory work-up revealed a normal complete blood count (CBC), normal renal function (creatinine 1.0 mg/dL), potassium 5.1 mmol/L, normal hepatic function, magnesium levels 5.1 mg/dl (1.7 -2.5 mg/dl), Sodium 119 mmol/l (135 -145 mmol/l), Prothrombin time (PT) normal, activated partial thromboplastin time (APTT) normal, INR normal. A diagnosis of Hypermagnesemia induced post-op ileus associated with Hyponatremia and Hypochloremia.

She received 4 g of Calcium gluconate in 500 cc of normal saline over a period of 4 hours and multiple isotonic Saline for the Hyponatremia and Hypochloremia. The surgical dressing was changed trice, heavily soaked, though she remained hemodynamically stable. Day 4 was marked by reduction in abdominal distention, following multiple emptying of the gas filled NG tube collection bag, The bleeding from the surgical site reduced and became mixed with peritoneal fluid (ascites). A repeat investigation including a FBC, PT, APTT, Magnesium, Urea, Creatinine and Sodium control, and maternal serum albumin were requested. Magnesium was at 4.4 mg/dl, Sodium 126 mmol/l, and albumin 18 g/dl (38 -51 g/dl). A diagnosis of severe hypoalbuminemia (Nephrotic syndrome range proteinuria) was made, in the context of Hypermagnesemia and Hyponatremia. On day 5 she received a single dose of total parenteral nutrition (TPN), Kabiven® 1400 kcal. Marked improvement was noticed 24 hours later, by the significant reduction in bowel distention, cessation of serosanguinous fluid drainage at the surgical site, return of bowel movement, and reduction of the generalized oedema. The NG tube was removed. Her control work-up on day 7 revealed Magnesium at 2.3 mg/dl, Sodium at 126 mmol/l, and albumin at 31 g/dl (38 -51 g/dl). she was transferred the following day to the Maternity, for continuous follow up. Her Blood pressure went below 140/90 mmhg.

Table 1: day 2 work ups: hypermagnesemia, hyponatremia.

Test	Results	Range	Remarks
ALAT	25IU/L	0 – 40IU/L	Normal
ALAT	40IU/L	0 – 40IU/L	Normal
Urea	47mg/dl	10 – 50 mg/dl	Normal
Creatinine	1.0mg/dl	0.6 – 1.1 mg/dl	Normal
Calcium	9.5 mg/dl	8.8 – 10.2 mg/dl	Normal
Magnesium	5.1 mg/dl	1.7 – 2.5 mg/dl	High *2
Chloride	92mmol/l	98 – 108mmol/l	Low
Potassium	5.5mmol/l	3.5 – 5.5 mmol/l	Normal
Sodium	119mmol/l	135 – 145 mmol/l	Low

Table 2: day 4 work ups indicating severe hypoalbuminemia.

Test	Result	Range	Remarks
Albumin	18g/dl	38 – 51g/dl	Low *2

Table 3: day 4 work ups indicating normal clotting profile.

Test	Result	Range	Remarks
APTT	28.1 seconds	18 – 120 seconds	Normal
PT	12.4 seconds	10 – 14 seconds	Normal

**Figure 1:** Hematoma collection at the surgical site.**Table 4:** day 4 work ups indicating mild hypermagnesemia and mild hyponatremia.

Test	Results	Range	Remarks
Calcium	6.8 mg/dl	8.8 – 10.2 mg/dl	low
Magnesium	4.4 mg/dl	1.7 – 2.5 mg/dl	High
Chloride	100 mmol/l	98 – 108 mmol/l	Normal
Potassium	4.9 mmol/l	3.5 – 5.5 mmol/l	Normal
Sodium	126 mmol/l	135 – 145 mmol/l	Low

Table 5: day 7 work ups indicating normal range magnesium levels.

Test	Results	Range	Remarks
Calcium	9.6 mg/dl	8.8 – 10.2 mg/dl	Normal
Magnesium	2.3 mg/dl	1.7 – 2.5 mg/dl	Normal

Table 6: day 9 work ups indicating mild hypoalbuminemia.

Test	Results	Range	Remarks
Albumin	31 g/dl	38 – 51 g/dl	Normal

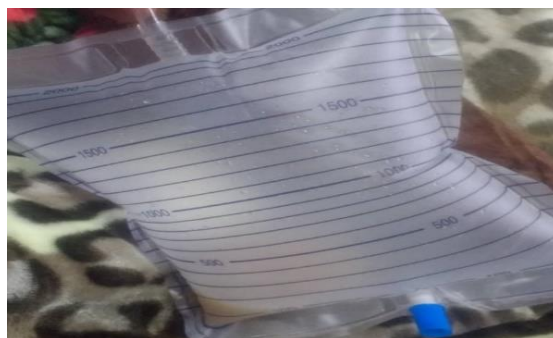


Figure 2: Nasogastric tube collection bag containing air.

Discussion

Adults with normal renal function, will not present with post operative ileus as a result of hypermagnesemia, the reported cases were due to its exogenous intake (Birrer *et al.*, 2002). Our patient developed Hypermagnesemia following the administration of the 14g loading dose magnesium sulphate to prevent seizures (eclampsia). Hypermagnesemia manifests clinically at serum levels greater than 2 mmol/L (4.8 mg/dL). In obstetrics magnesium toxicity is known, with its various clinical presentations corresponding to the serum levels (McDonnell *et al.*, 2010). The paralytic effect of magnesium in humans has been reported only in a few cases, including a patient receiving parenteral magnesium sulfate for tocolysis, and in patients on magnesium laxatives and Epsom salts for chronic constipation. Our patient had a magnesium level of 5.1 g/dl, which was done 48 hours after the administration of the loading dose magnesium sulphate. We postulate that these values may have been higher if done within 24 hours and coupled with her normal renal function. These serum levels couldn't present with other known complications, which are seen at levels > 6 g/dl (Lu and Nightingale, 2000) (Table 1-6).

The effect of decreased colloid oncotic pressure, as seen in hypoalbuminemia on intestinal function has been well delineated in the surgical literature. Hypoalbuminemia is an independent predictor of prolonged POI in surgery and critically ill patients (Lohsirawat *et al.*, 2007). In our case, 48 hours following the administration, of Calcium gluconate to normalize the magnesium levels, the was very little improvement in the clinical state of the patient. We only observed the returned of bowel motility 24 hours after the administration of total parenteral nutrition, precisely at end of the 6th day. We became aware that the severe hypoalbuminemia had a direct impact on the return of bowel motility, after the control of the maternal serum albumin levels on the 9th day, which was 31 g/dl. This proves that the single dose of TPN (kabiven® 1440 kcal) moved our patient from a severe hypoalbuminemic state to a mild hypoalbuminemia state. We postulate that the severe hypoalbuminemic state prolonged or aggravated the Hypermagnesemia

induced POI in our patient (Fig. 2). This hypothesis may appear new in obstetrics, as, there is little data implicating severe hypoalbuminemia aggravating Magnesium sulphate induced POI.

The bleeding from the surgical site which we thought could be as a result of a HELLP syndrome was ruled out, as our patient had a normal coagulation and hepatic profile and full blood count findings. We believed the increased intra-abdominal pressure and the severely elevated blood pressure readings, induced the bleeding. Moreover, the bleeding stopped once the intra-abdominal pressure and the blood pressure reduced.

About two cases of concomitant ascites, hyponatremia and hypochloremia in the context of preeclampsia have been reported. The proposed hypothesis is that the hypoalbuminemia in preeclampsia is nephrotic syndrome range proteinuria and may be the contributing factor to the hyponatremia and ascites. Some hypothesize that the hemoconcentration in preeclampsia may stimulate the release of ADH, which leads to hyponatremia (Wilson and Shutt, 2007; Ghazali and Al-Domyati, 2019).

Our patient had nephrotic syndrome range proteinuria with secondary severe hypoalbuminemia, which may explain the hyponatremia, hypochloremia and the ascites. Nguyen *et al* describe a phenomenon which was created by Pitts RF, called the Gibbs-Donnan effect. They stated that the reduced permeability of proteins across the capillary membranes causes different ionic concentrations between the plasma and interstitial fluid, thus the non-permeating negatively charged proteins present mostly in the plasma will force the electropositive ions (Na^+ , K^+) and force back negative ones. Implying that a reduction in plasma proteins will affect the plasma Na^+ and Cl^- concentrations. The TPN which is high in proteins may have corrected the hyponatremia and hypochloremia by two mechanisms in our patient; firstly by fact that it contains Na^+ and Cl^- , and secondly by the indirect effect of the elevated albumin levels. The combined effect of Hyponatremia, Hypochloremia coupled with the severe hypoalbuminemia, played a crucial role in prolonging the post op ileus in our patient.

Conclusion

Paralytic ileus is an uncommon post operative finding in emergency operative obstetrics, given the increased risk of infections, which will present as mechanical obstruction. In the context Preeclampsia, multiple causes of post operative ileus may be present; Hypermagnesemia, Hypochloremia, Hyponatremia and Hypoalbuminemia. This will pose both a diagnostic and a therapeutic challenge, especially in resource poor settings, hence the importance of evaluating the maternal serum levels of serum Albumin and Magnesium.

Conflict of Interest: None.

Consent for Publication: We have obtained a written consent from the patient described in this case.

Acknowledgement: This study was made possible following authorization by the administrative authorities of Buea Regional Hospital.

References

Al-Shoha M, Klair JS, Girotra M, Garcia-Saenz-de-Sicilia M. Magnesium Toxicity-Induced Ileus in a Postpartum Patient Treated for Preeclampsia with Magnesium Sulphate. *ACG Case Rep J* 2015; 2: 227-229.

Birrer RB, Shallash AJ, Totten V. Hypermagnesemia-induced fatality following epsom salt gargles (1). *J Emerg Med* 2002; 22: 185-188.

Chen H, Tao F, Fang X, Wang X. Association of hypoproteinemia in preeclampsia with maternal and perinatal outcomes: A retrospective analysis of high-risk women. *J Res Med Sci* 2016; 21: 98.

Dubois MJ, Orellana-Jimenez C, Melot C, De Backer D, Berre J, Leeman M, Brimiouille S, Appoloni O, Creteur J, Vincent JL. Albumin administration improves organ function in critically ill hypoalbuminemic patients: A prospective, randomized, controlled, pilot study. *Crit Care Med* 2006; 34: 2536-2540.

Gestational Hypertension and Preeclampsia: ACOG Practice Bulletin, Number 222. *Obstet Gynecol* 2020; 135: e237-e260.

Ghazali S, Al-Domyati M. Severe Hyponatremia and Ascites Associated with Preeclampsia. 2019; 6(1).

Ghazali S, Al-Domyati M. Severe hyponatremia and ascites associated with preeclampsia (2019).

Gordon R, Magee LA, Payne B, Firoz T, Sawchuck D, Tu D, Vidler M, de Silva D, von Dadelszen P. Magnesium sulphate for the management of preeclampsia and eclampsia in low and middle income countries: a systematic review of tested dosing regimens. *J Obstet Gynaecol Can* 2014; 36: 154-163.

Liang WQ, Zhang KC, Li H, Cui JX, Xi HQ, Li JY, Cai AZ, Liu YH, Zhang W, Zhang L, Wei B, Chen L. Preoperative albumin levels predict prolonged postoperative ileus in gastrointestinal surgery. *World J Gastroenterol* 2020; 26: 1185-1196.

Lohsiriwat V, Chinswangwatanakul V, Lohsiriwat S, Akaraviputh T, Boonnuch W, Methasade A, Lohsiriwat D. Hypoalbuminemia is a predictor of delayed postoperative bowel function and poor surgical outcomes in right-sided colon cancer patients. *Asia Pac J Clin Nutr* 2007; 16: 213-217.

Lu JF, Nightingale CH. Magnesium sulfate in eclampsia and pre-eclampsia: pharmacokinetic principles. *Clin Pharmacokinet* 2000; 38: 305-314.

McDonnell NJ, Muchatuta NA, Paech MJ. Acute magnesium toxicity in an obstetric patient undergoing general anaesthesia for caesarean delivery. *Int J Obstet Anesth* 2010; 19: 226-231.

Wilson HJ, Shutt LE. Syndrome of inappropriate ADH secretion in a woman with preeclampsia. *Int J Obstet Anesth* 2007; 16: 360-362.