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Anesthetic Management in Preeclampsia Patients with Thalassemia Minor B: A Case Report

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A B S T R A C T

Introduction: One of the complications of anesthesia that can be encountered in thalassemia patients is cardiovascular instability caused by chronic anemia, cardiomyopathy, and endocrinopathy. In addition, patients with preeclampsia may also experience postoperative risks such as sustained hypertension, stroke, venous thromboembolism, and seizures. This case report will discuss the anesthetic management of pregnant women with preeclampsia and β thalassemia minor. **Case presentation:** The patient is a pregnant woman G6P0141, 34 weeks gestation, with preeclampsia and a history of minor β thalassemia without therapy. Patients with thalassemia minor are often asymptomatic before pregnancy, but physiological changes during pregnancy can contribute to anemia during pregnancy. Beta thalassemia minor is also associated with an increased incidence of hypertension in pregnancy. Neuraxial anesthesia is recommended in preeclamptic patients to avoid severe hypertension and has a protective effect against postoperative apnea in premature infants. **Conclusion:** Anesthetic management in asymptomatic patients with minor thalassemia is not much different from normal pregnant women. The risk of bleeding needs special attention, especially in thalassemia patients who have anemia. In patients with preeclampsia, neuraxial anesthesia is preferred over general anesthesia. Postoperative patient care is carried out in an obstetric high dependency unit (OHDU). The patient went home after being treated for 3 days without complications at the hospital.

1. Introduction

β-thalassemia is a genetic condition caused by a mutated β-globin gene, resulting in reduced production of β-globin chains in hemoglobin. β thalassemia is most often found in populations originating from the Mediterranean, Middle Eastern, and Asian areas. More than 200 different mutations in the β-globin gene have been associated with β thalassemia, which demonstrates the wide variability of β thalassemia in terms of genotype and phenotype.[1] Thalassemia minor is often asymptomatic or can cause mild microcytic hypochromic anemia.[2] Pregnant women with thalassemia minor can have lower hematocrit levels compared to normal pregnant women.

In general, thalassemia minor does not cause anesthetic problems. Monitoring of the patient's hemoglobin level should be performed, and preoperative transfusion may be considered if necessary. Other complications to note are cardiovascular instability caused by chronic anemia, cardiomyopathy, and endocrinopathies. Patients with preeclampsia are at risk of fetal and maternal harm. In addition, patients with preeclampsia may also experience postoperative risks such as sustained hypertension, stroke, venous thromboembolism, and

seizures. The provision of effective postoperative analgesia also plays a role in controlling the patient's blood pressure. Patient monitoring can be carried out in the intensive care unit, especially in unstable patients. This case report will discuss the anesthetic management of pregnant women with preeclampsia and β thalassemia minor.

2. Case Presentation

A pregnant woman G6P0141 with a gestational age of 34 weeks 5 days came with complaints of clear discharge accompanied by intermittent abdominal pain. Complaints of paleness accompanied by sufferers easily feeling tired, tired, and lethargic were denied. Complaints not accompanied by yellow eyes or body, body heat, bleeding nose, gums, or red spots on the skin are denied. The patient has a history of thalassemia minor B since 2016 but did not receive therapy. History of hypertension, diabetes mellitus, heart disease, and other systemic diseases was denied. History of drug and food allergies was denied. The patient had a history of taking aspilet one tablet per day from 12 weeks of gestation, and the last consumption was one day before entering the hospital. Operation history: 2009 / appendicectomy /general anesthesia (GA) without complications; 2013 / curettage / GA without complications; 2019 / curettage / GA without complications; 2020 / curettage / GA without complications

From the physical examination, the patient's weight was 66 kg, and the patient's height was 150 cm (BMI = 32.8 kg/m^2). The patient's axillary temperature is 36.5^{O}C, blood pressure (BP) 159/100 mmHg, pulse 96 beats per minute regular, respiratory rate (RR) 20 times per minute, and blood oxygen saturation (SpO_2) 99% room water. Apfel score rating = 3/4. The patient's consciousness is good with the Glasgow coma scale (GCS) E4V5M6. No abnormalities were found on the physical examination of the chest and abdomen. The uterine fundus is palpable at the level midway between the xiphoid process and the umbilicus, with a fetal heart rate (FHR) of 145 x/minute. Good neck flexion and deflection, Mallampati score III, intact teeth, warm acral, capillary refill time (CRT) <2 seconds, well palpable interspinous space, and no signs of infection around it. The results of supporting examinations are shown in Table 1.

Table. 1 Laboratory examination.

Laboratory examination			
Examination	**Results**	**Unit**	**Reference value**
WBC	19.85	10^3/µL	4.1 - 11.0
HB	12.30	g/dL	12.0 - 16.0
HCT	37.20	%	36.0 - 46.0
MCV	78.20	fL	80.0 - 100.0
MCH	25.80	Pg	26.0 - 34.0
MCHC	33.10	g/dL	31 - 36
PLT	268.00	10^3/µL	140 - 440
BUN	9.30	mg/dL	8.00 - 23.00
SC	0.42	mg/dL	0.57 - 1.11
PT	11.9	Second	10 - 12.7
APTT	31.4	Second	23 - 34.7
INR	0.83		0.9 - 1.1
BS	70	mg/dL	70 - 140
Sodium	138	mmol/L	136 - 145
Potassium	4.40	mmol/L	3.50 - 5.10
SGOT	33.1	U/L	5.00 - 34.00
SGPT	30.80	U/L	11.00 - 34.00
Albumin	2.83	g/dL	3.40 - 4.80
HBsAg	Non-reactive		Non-reactive
TPHA	Negative		Negative
Urinalysis	Protein (+3),		Negative
	Negative ketones		Negative

Prior to the procedure, the patient's family explained the technique of anesthesia of the lower half of the body and how to get informed consent. Preparation of ready-to-use blood components, if there is an indication for transfusion, a blood pack that does not contain leukocytes (leukocyte-depleted packed red blood cells) is better to use. Inserting a large intravenous (IV) line was done on the left hand (18G), connected with a three-way, and given ringer lactate fluid at a rate of 93.3 ml/hour. In the operating room, the patient was well conscious with GCS E4V5M6, BP 159/100 mmHg, pulse 96 x/minute, RR 20 x/minute, SpO_2 99% with nasal cannula 3 liters per minute (lpm), FHR 145 x/minute. STATICS routine preparation (scope, tube, airway, tape, introducer, connector, suction), anesthesia machines, anesthetic drugs, and emergency drugs. Anesthesia was planned using subarachnoid block regional anesthesia (RA-BSA) with dexamethasone 10 mg IV premedication and diphenhydramine 10 mg IV premedication. The patient was positioned on her left side with her legs bent, an aseptic procedure was performed in the lumbar area (anesthesia field area), and infiltration of local anesthetic with 2% lidocaine was performed. A 27G spinal needle was inserted at L4-L5. Furthermore, the patient was positioned supine and continued with a pinprick test to find the height of the block. The medication given was hyperbaric bupivacaine 0.5% 15 mg, ondansetron 4 mg IV, oxytocin 20 IU IV, and tranexamic acid 1000 mg IV.

During the surgical procedure, the patient experienced hemodynamic fluctuations as follows: systolic BP 98-177 mmHg; Diastolic BP 61-106 mmHg; HR 76 - 109 beats/minute; RR 18 - 20 times/minute; SpO_2 99 -100% (nasal cannula 2-3 lpm). The surgical procedure lasts 100 minutes. Birth of a baby girl with a birth weight of 1,180 grams, an Apgar score of 3-7, along with the birth of a complete placenta. In addition, a bilateral tubectomy was also performed on the patient. Postoperative patient care is carried out at OHDU. The patient went home after being treated for 3 days without complications at the hospital.

3. Discussion

Planned cesarean section (CS) is recommended for thalassemia patients to avoid the cardiovascular stress associated with the delivery and anticipate the high incidence of cephalopelvic disproportion found in patients with thalassemia.[4] In general, patients with thalassemia minor do not experience anesthetic problems. Although there are no specific guidelines regarding optimal perioperative hemoglobin levels, hemoglobin around 10 g/dL is considered safe for the patient.[6] Larger intravenous lines should be prepared prior to the procedure, but a second line may also be considered in patients at higher risk of bleeding.[5] Complete blood count with hemoglobin values within normal limits (12.3 g/dL) but showing characteristic hypochromic microcytic erythrocytes. After the operation, she was consulted by an internal medicine colleague for further management of thalassemia, then an examination of peripheral blood smears and hemoglobin analysis was carried out. However, there is no specific therapy for thalassemia.

Patients with preeclampsia have a greater risk of experiencing worsening in the maternal and fetoplacental aspects. Preeclampsia and eclampsia play a role in 15% of maternal and perinatal deaths. Maternal perfusion must be maintained while reducing systolic blood pressure below 110 mm Hg. The use of neuraxial anesthetics can cause venodilation, so low doses of IV phenylephrine or IV ephedrine may be required to maintain maternal perfusion.[5] The selection of anesthetic techniques and drugs must be adjusted to each case, according to the type of surgery and the patient's condition. Both general and neuraxial anesthesia are considered safe in patients with thalassemia. Inhalational agents and opioids can also be given for induction and maintenance anesthesia without significant side effects.[7] Spinal, epidural, or a combination of both techniques are reported to be safe in surgical patients with thalassemia.[7]

Perioperative blood loss should be minimized. Blood conservation strategies such as preoperative blood donation, administration of erythropoietin, and intraoperative use of tranexamic acid have shown good results in reducing blood loss and the need for blood

transfusions. If there is an indication for transfusion, a blood pack that does not contain leukocytes (leukocyte-depleted packed red blood cells) is better to use. Thalassemia patients who are immunocompromised and susceptible to infection can be given perioperative broad-spectrum antibiotic prophylaxis. Signs of infection should be monitored and evaluated during postoperative care.[8] In preeclamptic patients, administration of magnesium sulfate can contribute to decreased uterine muscle tone and increase the risk of uterine atony and postpartum hemorrhage. Therefore, additional uterotonic administration may be considered. The above patient was given oxytocin 20 IU IV as a uterotonic and tranexamic acid 1000 mg IV to prevent excessive bleeding.[5]

Premature babies, like in this case, have a higher risk of experiencing postoperative apnea, especially if accompanied by anemia. The risk of apnea is more than 1% in infants born before 35 weeks (not yet 54 weeks post conception) and in babies born before 32 weeks (not yet 56 weeks post conception. There is evidence that the use of spinal anesthesia (subarachnoid block) without additional sedatives has a protective effect against postoperative apnea.[5] Postoperative patient management will depend on the patient's preoperative status. Patients with asymptomatic thalassemia minor can be given postoperative management like normal patients in general. Patients with preeclampsia have a higher risk of developing pulmonary edema, sustained hypertension, stroke, venous thromboembolism, and seizures, so close monitoring is important.[5] Effective postoperative analgesic regimen sections Caesarea have a positive impact on blood pressure control, especially in patients with preeclampsia like the patient in this study.[5] The patient was treated at OHDU and given a combined opioid and non-opioid analgesic regimen. Postoperative analgesia using a multimodality approach with an emphasis on regional analgesia techniques is recommended.

4. Conclusion

Anesthetic management in asymptomatic patients with thalassemia minor is not much different from normal pregnant women. The risk of bleeding needs special attention, especially in thalassemia patients who have anemia. Preoperative transfusion may be considered in patients with low hemoglobin in anticipation of excess blood loss. In patients with preeclampsia, neuraxial anesthesia is preferred over general anesthesia.

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