CASE REPORT : PREECLAMPSIA

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ABSTRAK

Preeklamsia merupakan suatu kelainan pada kehamilan yang ditandai dengan peningkatan tekanan darah atau hipertensi disertai proteinuria yang terjadi pada usia kehamilan lebih dari 20 minggu pada wanita yang awalnya memiliki tekanan darah normal. Prevalensi preeklamsia sekitar 5% - 15% dari seluruh ibu hamil. Hal ini dapat menimbulkan komplikasi berat bahkan kematian pada ibu dan janin apabila tidak ditangani dengan baik. Presentasi kasus: Seorang wanita berusia 50 tahun dengan tinggi badan pasien 145 cm, berat badan pasien 50 kg dan IMT 23,7, dirawat di rumah sakit dengan diagnosis GIII P2002 37/38 GHHIU + PE + IUGR/IUGR. Tekanan darah pasien 177/102 mmHg dengan RR 19x/menit, suhu tubuh 36,6^{O}C, dan SO2 98% serta kadar Hb 7,2 g/dL, HCT 23,8%, MCV 72,3 fl, MCH 21,9, SCr 0,51mg/dL, BUN 6mg/dL, Kalium 3,4mmol/l, Albumin 3,23g/dL. Pasien tidak memiliki riwayat hipertensi, diabetes melitus, alergi dan asma. Riwayat pemeriksaan pasien pada usia kehamilan 35/36 minggu dimana pasien USG, kemudian didapatkan hasil fetus yang diduga IUGR dan memerlukan NICU sehingga pasien diberikan surat rujukan. Kesimpulan: Berdasarkan pharmaceutical care, pemberian terapi pada pasien sudah sesuai dengan pedoman. Pada pasien dengan preeklamsia, diagnosis yang tepat serta penanganan dan penatalaksanaan yang tepat oleh tim multidisiplin dapat mencegah komplikasi preeklamsia dan meningkatkan hasil pengobatan pasien preeklamsia.

Kata kunci : manifestasi klinik, preeklampsia, terapi farmakologi

ABSTRACT

Preeclampsia is a disorder of pregnancy characterized by increased blood pressure or hypertension with proteinuria that occurs at a gestational age of more than 20 weeks in women who initially had normal blood pressure. The prevalence of preeclampsia is around 5% - 15% of all pregnant women. This can cause severe complications and even death to the mother and fetus if not treated properly. Case presentation: A 50-year-old woman with a patient height of 145 cm, a patient weight of 50 kg and a BMI of 23.7, was hospitalized with a diagnosis of GIII P2002 37/38 GHHIU + PE + IUGR / IUGR. The patient's blood pressure was 177/102 mmHg with RR 19x/minute, body temperature 36.6^{O}C, and SO2 98% and Hb levels 7.2 g/dL, HCT 23.8%, MCV 72.3 fl, MCH 21.9, SCr 0.51mg/dL, BUN 6mg/dL, Potassium 3.4mmol/l, Albumin 3.23g/dL. The patient has no history of hypertension, diabetes mellitus, allergies and asthma. The patient's examination history at 35/36 weeks where the patient was ultrasound, then the results of the fetus were obtained which suspected IUGR and required NICU so that the patient was given a referral letter. Conclusion: Based on pharmaceutical care, the provision of therapy to the patient was in accordance with the guidelines. In patients with preeclampsia, proper diagnosis and proper treatment and management by a multidisciplinary team can prevent complications of preeclampsia and improve the outcome of preeclampsia patients.

Keywords: *clinical manifestations, preeclampsia, pharmacology therapy*

INTRODUCTION

Hypertension in pregnancy is one of the main causes of increased maternal morbidity and mortality. Preeclampsia often occurs during pregnancy. The prevalence of preeclampsia is around 5% - 15% of all pregnant women. Preeclampsia can cause serious complications and even death to the mother and fetus if not treated properly. Preeclampsia occurs in 2-5% of all pregnancies. Preeclampsia is one of the causes of increased maternal morbidity and mortality worldwide. Symptoms of preeclampsia occur due to impaired endothelial function that persists until cerebral autoregulation is disrupted. Preeclampsia can occur with or without HELLP

syndrome (hemolysis, increased liver enzymes, low platelets). If this dysfunction persists and worsens postpartum it will increase maternal mortality (Kahar et al., 2023).

Preeclampsia is a disorder in pregnancy characterized by increased blood pressure or hypertension (blood pressure ≥ 140/90 mmHg) accompanied by proteinuria (≥ 300 mg/24 hours) that occurs at a gestational age of more than 20 weeks in women who initially had normal blood pressure (Poon et al, 2017). Preeclampsia can also be interpreted as an abnormality in pregnancy characterized by systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg measured at least twice with a measurement interval of approximately four hours, accompanied by proteinuria (0.3 g/24 hours or ≥ 1+ proteinuria, or without proteinuria (Gathiram & Moodley, 2016). Preeclampsia is one of the causes of maternal and perinatal morbidity and mortality that occurs in 2-5% of pregnancies (Poon et al, 2017).

Preeclampsia can also be defined as gestational hypertension accompanied by ≥1 of the following new onset conditions at or after 20 weeks of gestation: proteinuria (≥30 mg/mol protein:creatinine ratio; ≥300 mg/24 hours; or ≥2+ dipstick), and other maternal organ dysfunction, including: acute renal impairment (creatinine ≥90 µmol/L; 1 mg/dL); liver impairment (elevated transaminases, e.g., alanine aminotransferase or aspartate aminotransferase >40IU/L) with or without right upper quadrant or epigastric abdominal pain; neurologic complications (eclampsia, altered mental status, blindness, stroke, clonus, severe headache, and persistent visual scotomata); or hematological, complications (thrombocytopenia-platelet count <150 000/µL, disseminated intravascular coagulation, hemolysis), and subsequently uteroplacental dysfunction (such as fetal growth restriction, umbilical artery Doppler waveform analysis, or stillbirth) (Poon et al, 2017).

According to The American College of Obstetricians and Gynecologists, the etiology of preeclampsia is still unclear. However, there are several risk factors associated with the occurrence of preeclampsia. Risk factors for preeclampsia include chronic hypertension before pregnancy, antiphospholipid antibody syndrome, autoimmune conditions such as lupus (Systemic lupus erythematosus/ SLE), age > 40 years, diabetes before pregnancy, chronic kidney disease before pregnancy, BMI > 30, pregnancy with more than one fetus, family history of preeclampsia, previous stillbirth and preeclampsia in previous pregnancies (Burton et al., 2019). Preeclampsia can be classified based on several factors including the time of onset of clinical manifestations, preeclampsia can be divided into 4, namely early onset preeclampsia (birth <34 weeks), late onset preeclampsia (birth ≥34 weeks), premature (birth <37 weeks), timely (birth ≥37 weeks) (Than et al., 2018).

Based on the explanation of the definition of preeclampsia and its very detrimental impact on patients, the author is interested in raising a case report on preeclampsia. This case report aims to discuss aspects of the definition, etiology, clinical manifestations, pathophysiology, diagnosis, supporting examinations, management, and prognosis of preeclampsia.

CASE PRESENTATION

Patient Identity

Table 1. Patient Identity

Name	Mrs. M
Age	50 years
Height	145 cm
History of illness	There isn't any
Treatment history	Pregnancy vitamins
Diagnosis	GIII P2001 35/36 mgg GHHIU + Head Position/Head Position + PEB + Fetus suspicious for IUGR + TBJ 1600/1800 g

Reason for admission to hospital	The patient came by himself bringing a referral from Hospital X with GIII P2002 37/38 GHHIU + PE + IUGR/IUGR. Because the fetus was suspected of having IUGR and needed NICU -> the patient was given a referral letter to Hospital Y.

Table 1 shows the assessment when the patient enters the hospital.

Clinical Data

Table 2. Clinical Data

Data klinis	12/3	13/3	14/3	15/3	16/3	17/3	18/3	Post op	19/3	20/3	21/3	22/3	23/3	24/3	25/3
Temperature	36,6	36,6	36,8	36,7	36,4	36,5	36,7	36,6	36,1	36,4	36,4	37,9	36,9	38	37,2
RR	19	20	18	20	18	20	20	20	20	18	18	20	20	20	20
HR	106	88	90	88	78	81	80	74	80	92	92	94	94	100	100
SpO2	98	98	98	98	98	98	98	98	100	99	99	99	99	99	99
Blood pressure	177 / 102	140 / 90	157 / 80	140 / 92	180 / 97	154 / 83	162 / 80	150 / 90	130 / 88	140 / 90	147 / 90	130 / 80	130 / 80	130 / 70	114 / 65
GCS	456	456	456	456	456	456	456	456	456	456	456	456	456	456	456
Pain scale	0	0	0	2	0	0	0	4	2	1	2	1	1	1	+

Based on clinical data in table 2, it was found that the patient's blood pressure has begun to be controlled. The patient's heart rate, respiratory rate, oxygen saturation and Glasgow coma scale are within normal limits. The patient's pain scale has begun to be resolved.

Laboratory Data

Table 3. Laboratory Data

Data Lab	Normal Value	12/3	15/3	17/3	18/3	21/3	24/3
Complete Blood							
Hb	11-14,7 g/dL	7,2	8,5	12	14,1	7,4	10,3
WBC	(3,37-10) x $10^3/\mu$l	7,61	9,48	9,68	9,04	13,28	13,72
PLT	150-450 x $10^3/\mu$l	244	196	197	243	256	323
HCT	35,2-46,7 (%)	23,8	28,2	37,9	45,2	23,9	33,4
MCV	86,7-102,3 fL	72,3	78,8	78,5	77,3	80,7	-
MCH	27,1-32,4 pg	21,9	23,7	24,8	24,1	25	-
MCHC	29,7-33,1 g/dL	30,3	30,1	31,7	31,2	31	-
Neut%	39,8-70,5%	73,3	79,6	79,9	80,2	85,4	-
Electrolyte Serum							
Na^+	136-145 mmol/l	141	144	-	-	137	-
K^+	3.5-5.1 mmol/l	3,4	3,2	-	-	4,9	-
Cl^-	98-107 mmol/l	104	105	-	-	101	-
Renal Function Test							
SCr	0.6-1.3 mg/dL	0,51	-	-	-	0,68	-
BUN	7-18 mg/dL	6	-	-	-	11	-
Liver Function Test							
SGOT	F: 0-35	25	-	-	-	22	-
SGPT	F: 0-35	11	-	-	-	7	-
Albumin	3,4 - 5,0 g/dL	3,23	-	-	-	2,92	-
Etc:							
GDA	mg/dL	73	-	-	-	75	-
PTT	9-12 second	12,5	-	-	-	-	-
APTT	23-33 second	26,9	-	-	-	-	-

Blood Gases							
27	7,35-7,45 mmHg	7,42	-	-	-	-	-
PCO2	35-45 mmHg	31	-	-	-	-	-
PO2	80-100 mmHg	90	-	-	-	-	-
TCO2	23-30 mmol/l	21,1	-	-	-	-	-
BE	-3,50 – 2,00 mmol/l	-4,4	-	-	-	-	-
HCO3	22,0-26,0 mmol/l	20,1	-	-	-	-	-

Based on laboratory data in table 3, it was found that the patient had anemia characterized by low levels of HGB, MCV and MCH. The patient's serum electrolytes were within normal limits. The patient had hypoalbuminemia. In the examination of coagulation function, the PTT value was prolonged but not too significant. The patient's serum creatinine and BUN had decreased but in the last examination it was already within normal limits. The patient's Blood Gas Analysis examination was within normal limits.

Microbiology Examination Data

Table 4. Microbiology Examination Data

Action	Specimen	Results
PCR Covid-19 (ID NOW) - All	Swab Nasopharynx	Culture PCR Covid-19 (ID NOW) : NEGATIVE

Based on the microbiological data in table 4, it was found that the patient was not exposed to the Covid-19 virus.

Therapy Management

Table 5. Therapy Management

Drug name	Dosage regimen
RDS Infusion	500 cc / 24 hours
PRC Transfusion	1 kolf
MgSO4 Injection 20%	4 g IV slow bolus, then 1 g/hour
Metildopa	3 x 500 mg tablet
Nifedipin	3 x 10 mg tablet
Adalat Oros	1 x 30 mg tablet
Nicardipine pump	2.5 mg/hour maintain 24 hours
Dexametason	2 x 6 mg IM sd 2 x 24 x hours
SF	2 x 1 tablet
KSR	3 x 600 mg tablet
Drip Oxytosin	20 iu in RD 500 cc / 34 hours
Tranexamic Acid Injection	3 x 500 IV
Metamizole Injection	1 g every 8 hours IV
Metoclopramide Injection	10 mg every 8 hours 1V
Paracetamol tablet	3 x 500 mg

The therapeutic management that patients received during hospitalization can be seen in table 5.

DISCUSSION

Patient Mrs. M, was hospitalized at Hospital Y on 12/3, the patient came to Hospital Y herself bringing a referral from Hospital X with GIII P2002 37/38 GHHIU + PE +

IUGR/IUGR. Because the fetus was suspected of having IUGR and needed NICU, the patient was given a referral letter to Hospital Y. The patient's blood pressure when examined was 177/102 mmHg with RR 19x/minute, body temperature 36.6OC, and SO2 98%, the patient's height was 145cm, the patient's weight was 50 kg and BMI 23.7. The patient's labor history was the first labor 9 months/SptB/BPM/L/2900 g/6 years, the second labor 9 months/SptB/Hospital X/L/3000 g/died at the age of 14 months due to Gastrointestinal Infection, and this third pregnancy. The patient has no history of hypertension, diabetes mellitus, allergies and asthma. In July 2021, the patient felt her period was late, the pregnancy test itself was positive.

The patient did not check anywhere because she had no complaints. From August 2021 to December 2021, the patient did not check anywhere because she had no complaints. From January to March 2022, the patient checked at the Nurisa clinic once on 03/01 25/26 weeks / BP: 118/69, the patient was given pregnancy vitamins and referred to PKM twice on 04/01 25/26 weeks / BP: 110/70, Hb 12, GDA 78, blood type AB, negative proteinuria. The patient checked at Hospital X once on 12/03 35/36 weeks, then the patient had an ultrasound, then the results showed that the fetus was suspected of IUGR and needed NICU so the patient was given a referral letter to Hospital Y.

The patient felt weak, short of breath and palpitations, so he was given fluid infusion therapy to improve and maintain fluid and electrolyte balance. RD5 is a colloid fluid that will prevent edema in patients because it prevents fluid from leaving the vascular bed. Parenteral infusion of RD5 (5% dextrose in lactated ringer) to meet normal calorie and electrolyte needs. After checking the patient's general condition, a blood pressure check was performed showing quite high blood pressure, namely 177/102 mmHg, so that from the beginning of admission to the hospital the patient had received antihypertensive therapy to overcome the patient's high blood pressure and received mgso4 prophylaxis to prevent seizures, because high blood pressure is a trigger for seizures. The patient received antihypertensive therapy with methyldopa, conventional nifedipine, Adalat oros and nicardipine pump. Initial therapy using a combination of 2 types of antihypertensive drugs is appropriate, namely the use of nifedipine according to SOGC and the Royal College of Obstetrics & Gynecology UK level 1-A.

Meanwhile, Methyldopa has a level 1-B according to SOGC and level evidence III according to the Royal College of Obstetrics & Gynecology UK. The expected target reduction of BP SBP <160 mmHg and DBP <110 mmHg (Level Evidence 1 A SOGC), but in patients it has not provided adequate results (162/90 mmHg) so that additional nicardipine was given (12/3 night). On (13/3) the next day, the patient's BP measurement gave quite good results. After the patient underwent a CS operation, the antihypertensive therapy used by the patient was Adalat oros 30 mg until the patient was KRS. Methyldopa is an antihypertensive α-adrenergic agonist (Peres et al., 2018). The mechanism of action of methyldopa is to stimulate central alpha-adrenergic receptors which results in decreased sympathetic flow of norepinephrine to the heart, kidneys, and peripheral blood vessels (POGI, 2016). Nifedipine is an antihypertensive with a mechanism of action that inhibits channels during Ca ion depolarization in myocardial muscle, resulting in relaxation of vascular smooth muscle and vasodilation of coronary blood vessels.

The use of oral nifedipine lowers blood pressure faster than intravenous labetalol, approximately 1 hour after initial administration. Nifedipine, in addition to acting as a selective renal arteriolar vasodilator and natriuretic, also increases urine production. Compared to labetalol which has no effect on the cardiac index, nifedipine increases the cardiac index which is useful in severe preeclampsia. The dose that has been given is correct (POGI, 2016). Methyldopa is used for mild hypertension, while nifedipine is effective for controlling moderate to severe hypertension. The use of extended release formulation (nifedipine) reduces the side effects of SNS (sympathetic nervous system) reflexes that lead to burning sensation,

tachycardia, worsening myocardial ischemia and cerebrovascular ischemia. Nicardipine is a calcium channel blocker, which inhibits the entry of calcium ions into the myocardium and is selective for coronary blood vessels that affect the contractile function of the heart muscle and smooth muscle of blood vessels. Intravenous Nicardipine effectively lowers BP through reducing afterload without disrupting maternal and fetal circulation in patients with PE and hypertensive crisis. Mediation through baroreceptors increases HR which induces an increase in cardiac output that ensures tissue perfusion. Nicardipine effectively reduces perfusion pressure. Nicardipine is selective for cerebral and coronary blood vessels that have the potential to reduce cardiac and cerebral ischemia. Nicardipine induces a hemodynamic response in women with PE which is characterized by the effectiveness of controlling BP through reducing afterload and increasing ventricular work without disrupting maternal and fetal circulation (POGI, 2016).

An effective anticonvulsant used in preeclampsia is magnesium sulfate. Administration of MgSO4 in preeclampsia aims to prevent seizures and its administration does not result in central nervous system depression in either the mother or the baby (Ali et al., 2019). Administration of MgSO4 in preeclampsia also prevents the risk of eclampsia. When administering MgSO4, monitoring of urine output, maternal reflexes, respiratory rate and oxygen saturation is necessary (Jain, 2015). The dose given is a loading dose of 4-6 g IV and a maintenance dose of 2-3 g/hour IV. Other dosage regimens are a loading dose of 10 g IM and a maintenance dose of 5 g/4 hours. If MgSO4 intoxication occurs, it is treated by administering gram of calcium gluconate (Ali et al., 2019). The mechanism of action of magnesium sulfate is to cause vasodilation through relaxation of smooth muscle, including peripheral blood vessels and the uterus, so that in addition to being an anticonvulsant, magnesium sulfate is also useful as an antihypertensive and tocolytic. Magnesium sulfate also plays a role in inhibiting N-methyl-D-aspartate (NMDA) receptors in the brain, which when activated due to asphyxia, can cause calcium to enter neurons, resulting in cell damage and seizures. Magnesium sulfate is the first choice in patients with severe preeclampsia. Magnesium sulfate is recommended as a prophylaxis against eclampsia in patients with severe preeclampsia (POGI, 2016).

During the USG examination, the results of the examination stated that the fetus was suspected of having IUGR (Intrauterine Growth Restriction) or commonly referred to as inhibited fetal development, and this is one of the points of establishing a diagnosis of preeclampsia. One of the problems found in babies suspected of having IUGR is the immaturity of the organ system such as lung maturation, so that when the baby is born, the condition of the lung matur must first be known (Kosim, 2016). Lung maturation or lung maturation is the process of lung development which is divided into several stages. These stages include the embryonic phase, pseudoglandular phase, canalicular phase, saccular phase, and the last is the alveolar phase. After passing through these five stages, the lungs will enter the postnatal growth stage. In premature babies, respiratory distress syndrome and asphyxia can occur. Respiratory distress syndrome occurs due to surfactant deficiency and asphyxia occurs due to immature lung factors o mmaturity of lung structure and function.

The way to reduce the risk of respiratory distress syndrome in premature babies is to give corticosteroids. Corticosteroid administration is carried out in pregnant women with a risk of premature birth 32-34 weeks of gestation. Corticosteroids that can be giv are betamethasone and dexamethasone. The dosage regimen for betamethasone is 2 doses of betamethasone 12 mg every 24 hours and the dosage for dexamethasone is 4 doses of 6 mg every 12 hours for 2 days given intramuscularly (Sekhavat et al., 2011). Antenatal corticosteroid administration is associated with decreased fetal and neonatal mortality, RDS (Respiratory Distress Syndrome), need for mechanical ventilation/CPAP, need for surfactant and cerebrovascular bleeding, necrotizing enterocolitis and impaired neurological development. Corticosteroids are given at gestational age ≤ 34 weeks to reduce the risk of RDS and fetal and neonatal mortality. (POGI,

2016). The patient experienced hypokalemia at the beginning of hospital admission on 12/3 (potassium level 3.4 mmol/l and on 15/3 (potassium level 3.2 mmol/l), the patient received KSR therapy 3 x 600 mg orally.

Based on Hofmeyr (2018) laboratory examination of the patient's potassium levels fell into the mild hypokalemia category, and the study also showed that when blood pressure levels increased, potassium levels decreased. Mild hypokalemia generally does not show symptoms, but there is a possibility that symptoms will appear in the form of weakness, constipation, nausea, muscle cramps and fatigue. Based on these results, pregnant women with hypertension are advised to have basic serum potassium and consume foods containing sufficient potassium or have potassium supplements during prenatal examinations (Hofmeyr et al., 2018). The patient received KSR therapy until the patient was discharged from the hospital on March 25, while on March 21 the patient's potassium level had been corrected to 4.9 mmol/l, to increase potassium levels by continuing to use KSR tablets is not appropriate, so it is better to simply provide advice to the patient and family so that the patient can consume bananas that contain a lot of potassium to increase the patient's potassium levels. So it should be remembered that the patient can still take food and drink intake orally so that the source of potassium can still be met.

The patient experienced anemia at the beginning of hospital admission (Hb level 7.2 g/dL; HCT 23.8%; MCV 72.3 fl; MCH 21.9) the patient received PRC transfusion therapy until the patient's Hb was more than 10 g/dL and the patient also received oral drug therapy, namely SF 2 x1 tablet. Based on the American Association of Blood Banks, PRC transfusion is given to treat anemia. Transfusion can be given for anemia with Hb: <8-10 g/dl until Hb reaches 10 g/dL (Szczepiorkowski & Dunbar, 2013). PRC contains red blood cells to increase the patient's erythrocyte levels. The use of PRC requires attention to allergic side effects in transfusion patients given if the Hb level is 7-8 g/dl 1 bag of PRC can increase Hb by 1 g/dl and Hct 3%. SF is used as a source of iron in anemia due to iron deficiency (Vary, 2015). Sulfas Ferrosus is used to treat anemia, the dose that can be used is 200 mg 2-3 times a day. The mechanism of action of SF tablets is to replace iron, found in hemoglobin, myoglobin, and other enzymes; allows oxygen transport through hemoglobin (Vary, 2015). As pregnancy progresses, the need for iron for fetal growth increases in proportion to fetal weight, with most iron accumulation during the third trimester. At the time of delivery, the mother loses a lot of blood so that such therapy is necessary.

The patient underwent a CS operation on March 18, the patient received oxytocin drip therapy of 20 IU in RD 500 cc per 24 hours, tranexamic acid injection 3 x 300 mg, metamizole injection 1 gram every 8 hours, metoclopramide injection 10 mg every 8 hours. Drip oxytocin 20 IU in RD 500 cc per 24 hours is used before surgery which aims to induce labor by inducing uterine contractions. Oxytocin activates G-protein coupled receptors which trigger an increase in intracellular calcium levels in uterine myofibrils which results in uterine contractions, increases local prostaglandin production, and then stimulates the uterus. Tranexamic acid injection is given to prevent post-op bleeding at a dose of 0.5-1 g three times a day by inhibiting the fibrinolysis process so that it speeds up the bleeding to stop. Post-CS bleeding is one of the complications that can occur and can be life-threatening. Tranexamic acid injection 3 x 500 mg is given to reduce the amount of blood loss during a Caesarean birth through its anti-fibrinolytic effect (Shahid & Khan, 2013).

Metamizole injection 1 gram each is used for postoperative patient analgesics, metamizole is an NSAID that is effective as an analgesic for mild to moderate pain with a central COX-3 inhibition mechanism and activation of the opioidergic and cannabinoid systems and blocking the prostaglandin pathway (Jasiecka et al., 2014). Metoclopramide injection 10 mg every 8 hours is an antiemetic by inhibiting dopamine receptors and serotonin receptors, so it can prevent nausea or vomiting caused by the effects of anesthesia. Metoclopramide works as a

dopamine antagonist, this mechanism accelerates gastric emptying and reduces gastroesophageal reflux. Postoperative stress ulcers occur due to invasive procedures that cause a stress response that causes a decrease in mucosal blood flow which triggers mucosal damage (Zeitoun, 2011).

Metoclopramide works by inhibiting dopamine receptors in the CTZ and vomiting center, shortening intestinal transit time and the vomiting center and at high doses can inhibit serotonin receptors (McCracken et al., 2008). On 19/3 the use of metamizole injection as an analgesic was stopped and replaced with the use of 1 gram of paracetamol to overcome patient pain after a CS operation. Paracetamol works as an analgesic by inhibiting N-methyl-D-aspartate, nitric oxide synthesis, and the release of prostaglandin E2. Paracetamol is given orally at a dose of 300 mg-1000 mg per day every 6-8 hours, a maximum dose of 4000 mg per day (Madhusudhan, 2013).

CONCLUSION

Based on pharmaceutical care, the provision of therapy to the patient was in accordance with the guidelines. In patients with preeclampsia, proper diagnosis and proper treatment and management by a multidisciplinary team can prevent complications of preeclampsia and improve the outcome of preeclampsia patients.

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