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Case Study

Management of Pregnancy With Kidney Failure : A Case Report

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A B S T R A C T

Background: Acute kidney injury (AKI) superimposed on chronic kidney disease (CKD) during pregnancy is associated with high maternal and fetal morbidity, including metabolic disturbances and intrauterine fetal death (IUFD). Early multidisciplinary management is essential to improve outcomes. **Case Presentation:** A 33-year-old woman, G3P2A0H2, at 34–35 weeks of gestation with two previous cesarean sections was referred with acute on CKD, metabolic acidosis, severe hypokalemia, anemia, and IUFD. She presented with progressive dyspnea for three days and absent fetal movement for three weeks. Ultrasonography confirmed singleton IUFD at 34–35 weeks of gestation. Laboratory examination showed Hb 6.8 g/dL, creatinine 3.4 mg/dL, urea 96 mg/dL, potassium 2.5 mmol/L, metabolic acidosis, and hypocalcemia. The patient was managed with oxygen therapy, electrolyte and acid–base correction, bicarbonate therapy, calcium supplementation, and packed red cell transfusion. Clinical and laboratory improvement was achieved during hospitalization, with suspected underlying Gitelman or Bartter syndrome contributing to refractory hypokalemia. **Conclusion:** Pregnancy complicated by AKI on CKD may result in severe maternal metabolic complications and IUFD. Prompt stabilization and multidisciplinary management are crucial to optimize maternal condition and guide further obstetric management..

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I. INTRODUCTION

Acute kidney injury (AKI) and chronic kidney disease (CKD) during pregnancy are important causes of maternal and fetal morbidity and mortality. Chronic kidney disease affects approximately 3–5% of women of reproductive age, while pregnancy-related AKI occurs in about 1 in 20,000 pregnancies in developed countries, with higher incidence reported in developing regions. Physiological changes during pregnancy may worsen underlying renal dysfunction, resulting in electrolyte imbalance, acid–base disorders, anemia, hypertension, and adverse fetal outcomes, including preterm delivery and intrauterine fetal death (IUFD).[1-3]

Women with CKD have significantly increased risks of adverse pregnancy outcomes, including preeclampsia, fetal growth restriction, preterm birth, and fetal loss. A systematic review reported that pregnant women with CKD have a twofold higher risk of adverse maternal outcomes and significantly increased fetal complications compared with healthy pregnancies. Pregnancy-related AKI may also occur as acute deterioration superimposed on previously undiagnosed CKD, further increasing maternal and perinatal morbidity.[4-7]

Electrolyte and metabolic disturbances are common complications in pregnant patients with renal disease. Severe hypokalemia and metabolic acidosis may lead to respiratory distress, muscle weakness, cardiac arrhythmia, and worsening maternal condition. Refractory hypokalemia may indicate underlying renal tubular disorders such as Gitelman syndrome or Bartter syndrome, which can become more apparent during pregnancy due to increased physiological and metabolic demands.[8-10]

Management of pregnancy complicated by AKI and CKD requires a multidisciplinary approach involving obstetricians, internists, nephrologists, and neonatologists. Stabilization of maternal condition through correction of electrolyte imbalance, acid–base disturbances, anemia, and optimization of renal function is essential before obstetric intervention. Early diagnosis and appropriate management are important to reduce maternal complications and improve pregnancy outcomes.[11,12]

II. METHODS

This study is a case report describing the clinical presentation and management of pregnancy complicated by acute kidney injury (AKI) superimposed on chronic kidney disease (CKD) with metabolic disturbances and intrauterine fetal death (IUFD). The case was managed at the Emergency Obstetric and Neonatal Unit (PONEK) of Dr. M. Djamil General Hospital Padang, a tertiary referral hospital with multidisciplinary obstetric and internal medicine services. Data were collected retrospectively from the patient's medical records after completion of clinical management.

Maternal data included age, obstetric history, antenatal care history, gestational age at presentation, clinical symptoms, physical examination findings, laboratory investigations, and imaging studies. Obstetric evaluation was performed according to standard clinical protocols, including maternal examination, fetal assessment, and ultrasonography. Gestational age was determined based on the last menstrual period and fetal biometric measurements obtained from ultrasonography.

Laboratory examinations included complete blood count, renal function tests, serum electrolytes, coagulation profile, arterial blood gas analysis, liver function tests, and serologic screening. Renal and metabolic abnormalities were evaluated collaboratively by the obstetrics and internal medicine teams. Serial laboratory monitoring was performed during hospitalization to assess response to therapy and progression of maternal condition.

Obstetric ultrasonography was performed to evaluate fetal viability, fetal biometry, presentation, placental location, and amniotic fluid volume. The diagnosis of intrauterine fetal death was established based on the absence of fetal cardiac activity. Maternal management included oxygen therapy, intravenous fluid administration, correction of electrolyte and acid–base disturbances, bicarbonate therapy, calcium supplementation, potassium replacement, and packed red cell transfusion according to clinical indications.

This case report aims to describe the clinical presentation, diagnostic evaluation, and multidisciplinary management of pregnancy complicated by AKI on CKD with severe metabolic disturbances and IUFD. Patient confidentiality was strictly maintained, and no identifiable personal information is disclosed in this report.

III. RESULT

A 33-year-old pregnant woman, gravida 3 para 2 abortus 0 living 2, was referred to the Emergency Obstetric and Neonatal Unit (PONEK) of Dr. M. Djamil General Hospital Padang at 34–35 weeks of gestation with a diagnosis of acute kidney injury (AKI) superimposed on chronic kidney disease (CKD), metabolic acidosis, severe hypokalemia, anemia, and intrauterine fetal death (IUFD). The patient had a history of two previous cesarean sections and had attended regular antenatal care visits with both a midwife and an obstetrician during pregnancy.

The patient presented with progressive shortness of breath for three days prior to admission, which worsened with activity and did not improve with rest. She also reported absent fetal movement for three weeks before admission. Physical examination revealed moderate general condition with stable vital signs, pale conjunctiva, and no signs of labor. Obstetric examination showed a fundal height of 20 cm, absent fetal heart sounds, and no uterine contractions.

Obstetric ultrasonography demonstrated a singleton intrauterine fetal demise with cephalic presentation corresponding to 34–35 weeks of gestation. Fetal biometry showed a biparietal diameter of 8.03 cm, abdominal circumference of 25.47 cm, and femur length of 5.53 cm, with an estimated fetal weight of 1484 grams. The placenta was located posteriorly, and oligohydramnios was noted with an amniotic fluid index of 2.9 cm.

Initial laboratory investigations revealed severe anemia with hemoglobin of 6.8 g/dL, elevated urea and creatinine levels of 96 mg/dL and 3.4 mg/dL, respectively, severe hypokalemia of 2.5 mmol/L, hypocalcemia, and metabolic acidosis with respiratory compensation on arterial blood gas analysis. The patient received multidisciplinary management including oxygen therapy, intravenous fluids, correction of potassium and acid–base imbalance, calcium supplementation, bicarbonate therapy, and packed red cell transfusion. During hospitalization, the patient's clinical condition gradually improved with reduction of dyspnea and improvement of laboratory parameters, including creatinine level decreasing to 1.8 mg/dL and normalization of potassium levels.

Further evaluation revealed refractory hypokalemia with suspicion of underlying Gitelman syndrome or Bartter syndrome. Pregnancy termination was postponed until maternal stabilization was achieved, and the patient was planned for multidisciplinary outpatient follow-up after improvement of her general condition..

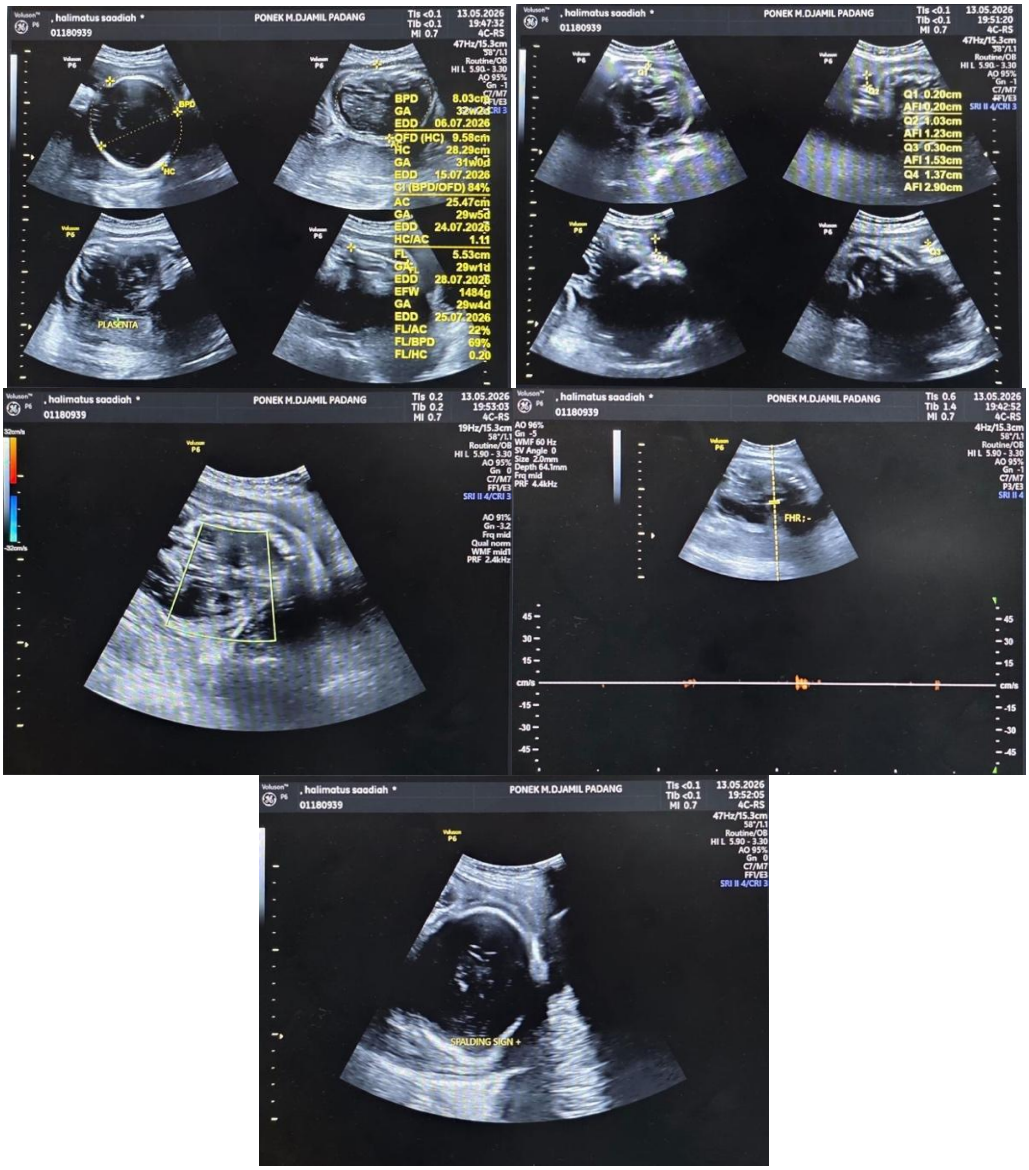


Fig 1: Ultrosonography examination.

IV. DISCUSSION

In the present case, pregnancy was complicated by acute kidney injury (AKI) superimposed on chronic kidney disease (CKD), severe hypokalemia, metabolic acidosis, anemia, and intrauterine fetal death (IUFD). Pregnancy in women with renal disease is associated with significantly increased maternal and fetal morbidity due to physiological alterations in renal hemodynamics and fluid-electrolyte balance during gestation. Chronic kidney disease affects approximately 3–5% of women of reproductive age and is associated with adverse pregnancy outcomes including preeclampsia, fetal growth restriction, preterm delivery, and fetal death.[1-3]

Pregnancy-related AKI remains an important contributor to maternal morbidity, particularly in developing countries. AKI may occur as a new-onset renal disorder or as acute deterioration superimposed on previously undiagnosed CKD. In this case, the patient presented with progressive dyspnea, elevated serum creatinine and urea, metabolic acidosis, and severe hypokalemia, indicating significant renal dysfunction. Previous studies have demonstrated that worsening renal

function during pregnancy is associated with poor maternal and fetal outcomes, particularly when accompanied by electrolyte and acid–base disturbances.[4-6]

Electrolyte imbalance is a common complication in renal disease during pregnancy. Severe hypokalemia may lead to muscle weakness, respiratory distress, and cardiac arrhythmias, while metabolic acidosis may worsen maternal respiratory symptoms due to compensatory hyperventilation. In this patient, recurrent refractory hypokalemia raised suspicion of underlying renal tubular disorders such as Gitelman syndrome or Bartter syndrome. Pregnancy may exacerbate these disorders because of increased physiological demand and altered renal handling of electrolytes. Recognition of these underlying conditions is important for long-term management and counseling regarding future pregnancies.[7-9]

Fetal surveillance is an essential component in pregnancies complicated by maternal renal disease. Ultrasonography in this case demonstrated singleton intrauterine fetal demise with oligohydramnios and fetal biometry corresponding to 34–35 weeks of gestation. Chronic placental insufficiency, maternal metabolic abnormalities, severe anemia, and impaired uteroplacental perfusion may contribute to adverse fetal outcomes, including IUFD. Previous studies have shown that women with CKD and AKI have significantly higher risks of fetal loss, preterm birth, and low birth weight compared with healthy pregnant women.[10-12]

Anemia is another important complication frequently encountered in CKD during pregnancy. Reduced erythropoietin production, chronic inflammation, and nutritional deficiency contribute to anemia in renal disease. Severe maternal anemia may worsen tissue hypoxia and further compromise placental oxygen delivery. In this case, the patient presented with severe anemia requiring packed red cell transfusion, which contributed to subsequent clinical improvement.[13-15]

Management of pregnancy complicated by AKI and CKD requires a multidisciplinary approach involving obstetricians, internists, nephrologists, and critical care teams. Stabilization of maternal condition through correction of electrolyte imbalance, acid–base disorders, anemia, and optimization of renal function should be prioritized before obstetric intervention whenever possible. In this case, multidisciplinary management with intravenous fluid therapy, bicarbonate administration, potassium correction, calcium supplementation, and blood transfusion resulted in gradual improvement of maternal condition and laboratory parameters. Studies have shown that coordinated care in tertiary referral centers improves maternal stabilization and pregnancy outcomes in women with renal disease.[2,11,16]

The timing of pregnancy termination in cases complicated by severe maternal systemic disease should be individualized according to maternal stability and obstetric indications. In this patient, pregnancy termination was postponed until improvement of maternal condition was achieved. Such management is consistent with current recommendations emphasizing maternal stabilization before definitive obstetric intervention in critically ill pregnant patients.[1,17-20]

Despite advances in nephrology and maternal critical care, pregnancy complicated by AKI and CKD remains a major clinical challenge because of the high risk of maternal and fetal complications. This case highlights the importance of early recognition, serial laboratory monitoring, multidisciplinary collaboration, and comprehensive evaluation of underlying renal disorders in pregnant patients presenting with severe metabolic abnormalities and adverse fetal outcomes.[1-3]

V. CONCLUSION

Acute kidney injury (AKI) superimposed on chronic kidney disease (CKD) during pregnancy is a serious condition associated with significant maternal and fetal morbidity and mortality. Early recognition of renal dysfunction, electrolyte imbalance, metabolic acidosis, and anemia is essential

to prevent further maternal deterioration and adverse fetal outcomes such as intrauterine fetal death (IUFD). In this case, prompt multidisciplinary management contributed to gradual improvement of maternal clinical and laboratory conditions.

Management of pregnancy complicated by AKI and CKD should focus on stabilization of maternal condition through correction of electrolyte and acid–base disturbances, optimization of renal function, and treatment of associated complications before obstetric intervention whenever possible. A multidisciplinary approach involving obstetricians, internists, nephrologists, and critical care teams is essential to optimize maternal outcomes and guide further pregnancy management. Early diagnosis, serial monitoring, and coordinated care remain key factors in reducing complications in pregnancy complicated by renal disease.

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