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Pregnancy in the Setting of Advanced Chronic Kidney Disease Complicated by Early-Onset Severe Preeclampsia, Severe Fetal Growth Restriction, and Placental Abruption: A Case Report

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Case Report

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ABSTRACT

Introduction: Chronic kidney disease (CKD) is one of the major chronic conditions affecting women of reproductive age and renders pregnancy a high-risk condition. Pregnancy in women with CKD is associated with an increased risk of maternal and fetal complications, including preeclampsia, fetal growth restriction (FGR), preterm delivery, placental abruption, and deterioration of renal function. The management of these patients requires comprehensive preconception assessment, specialized antenatal care, and a multidisciplinary team approach. Herein, we report a case of pregnancy complicated by advanced chronic kidney disease and severe obstetric complications.

Case Presentation: A 36-year-old primigravida (G1P1) with a history of advanced chronic kidney disease was admitted at 26 weeks of gestation because of elevated blood pressure. Clinical and paraclinical evaluations led to the diagnosis of severe preeclampsia, severe fetal growth restriction, abnormal umbilical artery Doppler findings, and placental abruption. Owing to the critical maternal and fetal conditions, supportive management, including administration of betamethasone, magnesium sulfate, and antihypertensive medications, was initiated. Subsequently, the patient underwent an emergency cesarean section with concurrent myomectomy. A preterm female neonate weighing 630 g was delivered and admitted to the neonatal intensive care unit (NICU) because of respiratory distress syndrome and patent ductus arteriosus.

Conclusion: Pregnancy in women with advanced chronic kidney disease is associated with a markedly increased risk of life-threatening maternal and fetal complications. This case highlights the importance of preconception counseling, comprehensive assessment of renal function, close surveillance throughout pregnancy, and multidisciplinary management to facilitate the early recognition of complications and determine the optimal timing of pregnancy termination. Furthermore, this report demonstrates that timely clinical decision-making and prompt intervention may play a pivotal role in reducing maternal complications and improving neonatal outcomes.

Keywords: Chronic kidney disease; Pregnancy; Preeclampsia; Fetal growth restriction; Placental abruption; Preterm delivery; Case report.

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Introduction

Chronic kidney disease (CKD) is one of the most important chronic non-communicable diseases, characterized by the progressive and irreversible decline in renal function, and is recognized as a major public health challenge worldwide [1,2]. The prevalence of CKD has increased substantially in recent years, largely owing to the growing incidence of diabetes mellitus, hypertension, obesity, and autoimmune disorders. Although CKD is relatively uncommon among women of reproductive age, advances in medical care and improved survival have enabled an increasing number of women with CKD to conceive [3,4]. Consequently, the management of pregnancy in this patient population has become an important concern in both maternal–fetal medicine and nephrology. Pregnancy in women with CKD poses considerable risks to both maternal and fetal health. Physiological adaptations during pregnancy, including increases in blood volume, cardiac output, renal blood flow, and estimated glomerular filtration rate (eGFR), are essential for normal fetal growth and development. However, in women with impaired renal function, these physiological changes may exacerbate renal injury, further reduce the functional reserve of the remaining nephrons, and accelerate the progression of kidney disease. In addition, disturbances in fluid and electrolyte homeostasis, activation of the renin–angiotensin–aldosterone system, chronic inflammation, and endothelial dysfunction create a favorable environment for the development of serious maternal and fetal complications [5,6].

Numerous studies have demonstrated that women with CKD are at a substantially higher risk of developing hypertensive disorders of pregnancy, particularly preeclampsia, compared with the general obstetric population [7,8]. Furthermore, distinguishing preeclampsia from the progression or exacerbation of the underlying renal disease is often challenging, making diagnosis and clinical management considerably more complex. In these patients, preeclampsia typically develops at an earlier gestational age, presents with greater severity, and frequently necessitates premature termination of pregnancy to preserve maternal and fetal well-being. Placental dysfunction represents another major consequence of CKD during pregnancy. Impaired uteroplacental perfusion, endothelial injury, and defective trophoblastic invasion reduce the delivery of oxygen and nutrients to the fetus, thereby predisposing to fetal growth restriction (FGR), oligohydramnios, abnormal umbilical artery Doppler findings, preterm birth, placental abruption, and increased perinatal mortality. These complications not only adversely affect maternal health but also contribute to higher rates of neonatal intensive care unit (NICU) admission, respiratory distress syndrome, complications related to prematurity, and neonatal mortality [9-11].

The severity of pregnancy-related complications in women with CKD is closely associated with the stage of kidney disease, the degree of reduction in eGFR, the presence of proteinuria, blood pressure control, and coexisting medical conditions [12,13]. Accordingly, most international clinical guidelines emphasize the importance of comprehensive preconception evaluation in women with CKD. Such evaluation should include careful assessment of renal function, blood pressure, the severity of proteinuria, current medications, and the risk of disease progression. In addition, patients and their families should be fully informed about the potential risks associated with pregnancy, including worsening renal function, the need for dialysis, preterm delivery, fetal growth restriction, and even maternal or fetal death, to facilitate informed decision-making. Preconception counseling has become a cornerstone of care for women with chronic kidney disease. In addition to assessing the feasibility of pregnancy, it provides an opportunity to optimize blood pressure control, adjust potentially harmful medications, stabilize renal function, and establish an individualized multidisciplinary care plan throughout pregnancy. Nevertheless, pregnancies may still occur without adequate preconception evaluation or despite relative or absolute medical contraindications, exposing both the mother and fetus to substantial risks and potentially life-threatening complications.

Reports of rare and complex clinical cases are valuable for expanding clinical knowledge and sharing practical management experience. Such reports can improve physicians' understanding of disease progression, diagnostic challenges, therapeutic decision-making, and the determination of the optimal timing of pregnancy termination in critical situations. Furthermore, they underscore the importance of close collaboration among specialists in obstetrics and gynecology, nephrology, maternal–fetal medicine, anesthesiology, and neonatology in the management of high-risk pregnancies. In this report, we present the case of a 36-year-old woman with advanced chronic kidney disease who presented at 26 weeks of gestation with severe preeclampsia, severe fetal growth restriction, abnormal umbilical artery Doppler findings, and placental abruption. Owing to the critical maternal and fetal conditions, an emergency cesarean section was performed. This case highlights the coexistence of multiple severe maternal and fetal complications in the setting of advanced chronic kidney disease and emphasizes the pivotal role of preconception evaluation, specialized counseling, and multidisciplinary management in improving maternal and neonatal outcomes.

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Case Presentation

A 36-year-old primigravida (G1P1) at 26 weeks of gestation was admitted to Sarem Super Specialty Hospital, Tehran, Iran, on February 7, 2026, because of elevated blood pressure. According to her medical history, she had been diagnosed with advanced chronic kidney disease prior to pregnancy and had been under the care of a urologist at another medical center. Despite her underlying renal disease, pregnancy had not been discouraged by her treating physician. However, given the severity of her renal dysfunction, the obstetric team considered continuation of the pregnancy to be associated with a substantial risk of further deterioration of renal function, irreversible loss of the remaining renal reserve, and even life-threatening maternal complications.

On admission, the patient presented with severe hypertension. Further clinical and laboratory evaluations were consistent with a diagnosis of severe preeclampsia. Obstetric ultrasonography and Doppler assessment demonstrated severe fetal growth restriction (FGR) accompanied by abnormal umbilical artery blood flow. In addition, both clinical and paraclinical findings were suggestive of placental abruption. Considering the critical maternal and fetal conditions, the multidisciplinary team decided to proceed with immediate termination of pregnancy.

To reduce neonatal complications associated with preterm delivery and to prevent seizures secondary to preeclampsia, pharmacological management was initiated before pregnancy termination. The patient received betamethasone to accelerate fetal lung maturation, magnesium sulfate for seizure prophylaxis, and methyldopa for blood pressure control. Subsequently, an emergency cesarean section was performed. Owing to a concurrent surgical indication, a myomectomy was also carried out during the procedure. A preterm female neonate weighing 630 g, measuring 30 cm in length, with a head circumference of 22 cm, was delivered. Because of extreme prematurity, respiratory distress syndrome (RDS), and patent ductus arteriosus (PDA), the neonate was admitted to the neonatal intensive care unit (NICU), where specialized neonatal care was provided.This case represents a high-risk pregnancy complicated by advanced chronic kidney disease, with the simultaneous occurrence of early-onset severe preeclampsia, severe fetal growth restriction, abnormal umbilical artery Doppler findings, and placental abruption, underscoring the necessity for prompt intervention and multidisciplinary management.

Discussion

Pregnancy in women with chronic kidney disease (CKD) represents one of the most complex clinical scenarios in maternal–fetal medicine and is consistently associated with an increased risk of severe maternal, fetal, and neonatal complications [14,15]. Although substantial advances in nephrology and obstetric care have enabled many women with CKD to achieve successful pregnancies, the management of these patients remains challenging because of the potential for deterioration of renal function, hypertensive disorders of pregnancy, fetal growth restriction, preterm delivery, and increased maternal and neonatal morbidity and mortality [16]. Furthermore, reports of rare and complex clinical cases play a pivotal role in enhancing clinicians' awareness, sharing therapeutic experiences, and improving clinical decision-making, particularly in situations where the coexistence of multiple severe complications complicates management and necessitates a multidisciplinary approach. Therefore, the present case may contribute to a better understanding of the challenges associated with pregnancy in women with advanced CKD and highlights the importance of preconception planning, close surveillance, and timely intervention in minimizing adverse maternal and fetal outcomes.

In the present report, a 36-year-old woman with a history of advanced chronic kidney disease presented at 26 weeks of gestation with severe hypertension. Clinical and paraclinical evaluations established the diagnosis of severe preeclampsia, severe fetal growth restriction, abnormal umbilical artery Doppler findings, and placental abruption. Given the critical maternal and fetal conditions, initial supportive and medical management, including antihypertensive therapy, magnesium sulfate administration, and corticosteroids for fetal lung maturation, was initiated, followed by emergency cesarean delivery. A preterm female neonate weighing 630 g was delivered and subsequently admitted to the neonatal intensive care unit because of extreme prematurity, respiratory distress syndrome, and patent ductus arteriosus. This case illustrates the coexistence of advanced chronic kidney disease with severe placental and hypertensive complications of pregnancy and emphasizes the importance of early diagnosis, continuous surveillance, and multidisciplinary management in improving maternal and neonatal outcomes.

Harjai and Junnare, in a retrospective study published in 2026, compared maternal and fetal outcomes between early-onset and late-onset preeclampsia and demonstrated that early-onset preeclampsia was associated with a significantly higher incidence of severe preeclampsia, preterm birth, extremely low birth weight, fetal growth restriction, intrauterine fetal death, neonatal intensive care unit admission, and low Apgar scores [17]. The findings of the present case are consistent with those of their study. Our patient developed early-onset preeclampsia at 26 weeks of gestation and underwent emergency cesarean delivery because of severe fetal growth restriction, placental abruption, and progressive deterioration of both maternal and fetal conditions. The neonate, who had

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an extremely low birth weight, required admission to the neonatal intensive care unit. This concordance is likely attributable to profound uteroplacental hypoperfusion, placental insufficiency, and widespread endothelial dysfunction characteristic of early-onset preeclampsia. In the present case, the coexistence of advanced chronic kidney disease may have further aggravated these pathophysiological mechanisms, thereby contributing to the severity of both maternal and fetal complications [17].

Similarly, Li et al., in a nested case–control study published in 2026 [18], investigated pregnancy outcomes and risk factors among women with chronic kidney disease and reported that CKD was associated with a significantly increased incidence of adverse maternal and neonatal outcomes, including preeclampsia, preterm birth, small-for-gestational-age infants, and other unfavorable neonatal outcomes. They further identified severe proteinuria, chronic hypertension, and elevated serum creatinine levels as the principal predictors of adverse maternal and neonatal outcomes. The findings of our case are in agreement with those reported by Li and colleagues, as our patient with advanced CKD developed early-onset severe preeclampsia, severe fetal growth restriction, preterm delivery, and required intensive neonatal care. The observed concordance is most likely explained by impaired renal function, endothelial dysfunction, reduced uteroplacental perfusion, and placental insufficiency, all of which substantially increase the susceptibility of women with CKD to hypertensive disorders of pregnancy and severe fetal complications [18].

Davidson et al., in a prospective cohort study published in 2025, evaluated the long-term impact of preeclampsia on kidney function and demonstrated that women with preeclampsia, particularly those complicated by acute kidney injury, were at a markedly increased risk of persistent hypertension, reduced estimated glomerular filtration rate (eGFR), albuminuria, and progression to chronic kidney disease [19]. Their study also showed that a considerable proportion of women with early-onset preeclampsia delivered before 34 weeks of gestation. The findings of the present case are likewise consistent with these observations, as our patient, who had pre-existing advanced chronic kidney disease, developed early-onset severe preeclampsia, necessitating termination of pregnancy at 26 weeks because of rapidly worsening maternal and fetal conditions. These findings further support the concept that CKD and preeclampsia have a bidirectional relationship, whereby chronic kidney disease predisposes women to preeclampsia, while preeclampsia may accelerate renal injury and promote the progression of underlying kidney disease. Consequently, meticulous postpartum surveillance of renal function and long-term nephrological follow-up are essential in this high-risk population [19].

Collectively, recent evidence indicates that chronic kidney disease is one of the most important risk factors for severe pregnancy complications, particularly early-onset preeclampsia, fetal growth restriction, preterm birth, and increased neonatal morbidity and mortality. Moreover, impaired renal function, proteinuria, and chronic hypertension substantially increase the likelihood of these adverse outcomes. Current evidence also supports a bidirectional relationship between CKD and preeclampsia, whereby CKD predisposes to the development of preeclampsia, while preeclampsia may further aggravate renal injury and accelerate disease progression. The present case exemplifies this complex interaction, in which advanced chronic kidney disease predisposed the patient to early-onset severe preeclampsia, followed by placental insufficiency, severe fetal growth restriction, abnormal umbilical artery Doppler findings, and placental abruption, ultimately necessitating emergency delivery at 26 weeks of gestation. The consistency of our findings with those reported in previous studies further underscores the importance of comprehensive surveillance, multidisciplinary management, and timely clinical decision-making to optimize maternal and neonatal outcomes in pregnancies complicated by advanced chronic kidney disease.

Conclusion

Pregnancy in women with advanced CKD remains one of the most complex and high-risk conditions in maternal–fetal medicine and is associated with a substantially increased risk of early-onset preeclampsia, placental insufficiency, fetal growth restriction, preterm delivery, and adverse neonatal outcomes. The present case demonstrates that, in such patients, early recognition of pregnancy-related complications, close monitoring of maternal renal function and fetal well-being, and close collaboration among specialists in obstetrics and gynecology, nephrology, maternal–fetal medicine, and neonatology play a pivotal role in optimizing both maternal and neonatal outcomes. Furthermore, this case highlights the critical importance of preconception counseling for women with chronic kidney disease. Comprehensive assessment of renal function, optimal blood pressure control, evaluation of proteinuria, appropriate adjustment of medical therapy, and thorough counseling regarding the potential risks of pregnancy may facilitate appropriate pregnancy planning and reduce the incidence of severe maternal and fetal complications. Finally, large-scale prospective studies are warranted to establish more effective strategies for the prediction, prevention, and management of pregnancies complicated by advanced chronic kidney disease.

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Ethical Issue
In conducting this research, all ethical principles in medical and biological research were observed in accordance with the Declaration of Helsinki, and the rights, dignity, and confidentiality of the participants were protected.

Conflict of Interests
There was no conflict of interest in this study.

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