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Successful Management of Two Cases of Nephrotic Syndrome During Pregnancy: The Case Report

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Case Report

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ABSTRACT

Introduction: Nephrotic syndrome during pregnancy is an important clinical condition that may be associated with maternal and fetal complications and requires careful maternal and fetal monitoring and follow-up. The management of these patients, particularly in cases complicated by pregnancy-related conditions, can be challenging in terms of diagnosis, maternal and fetal surveillance, and determining the appropriate timing of pregnancy termination. Given the importance of appropriate management in these patients, reporting the experience of specialized centers may contribute to a better understanding of the course of care and pregnancy outcomes in women with nephrotic syndrome. The aim of this case report was to describe the experience of Sarem Women's Hospital in Tehran in managing two pregnancies complicated by nephrotic syndrome and to assess the maternal and neonatal outcomes of these cases.

Case Presentation: In this report, two cases of pregnancy complicated by nephrotic syndrome are presented. The first case was a 34-year-old woman who was admitted at 36 weeks and 2 days of gestation for termination of pregnancy by cesarean section due to intrauterine growth restriction (IUGR) and abnormal fetal Doppler findings. Her pregnancy had been reported as normal up to that time, and prenatal screening tests and fetal echocardiography were normal. A male infant was delivered with Apgar scores of 10 and 9 and a reported birth weight of 2,410 gr. The second case was a 30-year-old woman with a history of preeclampsia in a previous pregnancy and a history of follow-up by a nephrologist, who received treatment and care during pregnancy. She was admitted at 37 weeks of gestation for cesarean section, and a female infant was delivered with a birth weight of 2,510 gr and Apgar scores of 10 and 9. The general condition of both neonates after birth was reported to be favorable.

Conclusion: These two cases demonstrate that pregnancy in patients with nephrotic syndrome may require close monitoring and collaboration between obstetricians and nephrologists. Monitoring maternal and fetal status and determining the appropriate timing and mode of pregnancy termination according to the clinical conditions of the mother and fetus are important components of the management of these patients. Given the limited information available in the medical records, further evaluation of clinical and laboratory parameters and longer-term follow-up are necessary for a more comprehensive assessment of disease progression and the effectiveness of therapeutic interventions.

Keywords: Nephrotic syndrome; Pregnancy; Kidney Disease; Cesarean Section; Intrauterine Growth Restriction; Case Report.

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Introduction

Pregnancy is accompanied by significant hemodynamic and physiological changes in the renal system. Increased renal blood flow and glomerular filtration rate during pregnancy result in alterations in renal function indices and a relative increase in urinary protein excretion. Although these changes are part of the normal physiological adaptation to pregnancy, the presence of underlying kidney disease may disrupt this physiological balance and increase the risk of maternal and fetal complications [1, 2]. In women with glomerular diseases, renal function, the degree of proteinuria, and the presence of hypertension are considered among the most important factors associated with adverse pregnancy outcomes [3–5].

Nephrotic syndrome is an important manifestation of glomerular diseases and is classically characterized by severe proteinuria, hypoalbuminemia, and edema. It may result from a diverse range of primary or secondary glomerular diseases [6, 7]. The development or exacerbation of nephrotic syndrome during pregnancy is of particular clinical importance because the physiological changes of pregnancy may affect the degree of proteinuria and renal function, while active glomerular disease may, in turn, affect the course of pregnancy and maternal and fetal health [8, 9]. Available studies have shown that pregnancy outcomes in patients with nephrotic syndrome are strongly influenced by renal function, the degree of proteinuria, and the presence of hypertension [10, 11].

One of the major clinical challenges in these patients is the increased risk of maternal and fetal complications. Glomerular diseases and nephrotic syndrome during pregnancy are associated with an increased likelihood of hypertension and preeclampsia, worsening proteinuria, impaired renal function, and, in some cases, preterm birth and intrauterine growth restriction [12]. In a review of studies concerning nephrotic syndrome secondary to primary glomerulopathies, differences in outcomes among various types of glomerular diseases have been reported; nevertheless, significant proteinuria, hypertension, and impaired renal function have been identified as important factors associated with adverse maternal and fetal outcomes [13].

Renal involvement during pregnancy can also complicate the assessment and diagnosis of preeclampsia. Proteinuria may be present before pregnancy or during its early stages, or it may develop or worsen as a result of an underlying glomerular disease. Conversely, increased proteinuria accompanied by blood pressure abnormalities during the second half of pregnancy may also occur in the context of preeclampsia [14, 15]. Therefore, interpretation of changes in proteinuria and renal function in a pregnant woman with kidney disease requires simultaneous consideration of the disease history, the timing of onset of proteinuria, blood pressure trends, and renal function status. This issue is particularly important in patients with a history of preeclampsia in a previous pregnancy.

On the other hand, fetal outcomes in women with glomerular diseases are not limited to the presence of preeclampsia. An increased risk of intrauterine growth restriction, low birth weight, and preterm birth has been reported in this group of patients. The magnitude of this risk depends on renal status and associated factors and may be greater in patients with hypertension, severe proteinuria, or impaired renal function. Therefore, pregnancy care in these patients requires simultaneous monitoring of maternal status and fetal growth and well-being, along with individualized decision-making regarding the timing and mode of delivery [16, 17].

The management of nephrotic syndrome during pregnancy is considered a multidisciplinary challenge because of the need to maintain maternal and fetal health while also considering the limitations associated with the use of certain medications that are effective in the management of kidney diseases. Assessment of renal function, monitoring of proteinuria and blood pressure, evaluation of fetal status, and close collaboration between nephrologists and obstetricians are important components of the care of these patients [18]. Furthermore, available data on many glomerular diseases are limited, and a substantial proportion of the evidence is derived from observational studies, case series, and case reports. Therefore, reporting clinical experiences may help expand the existing evidence regarding the management of these conditions.

Despite the importance of this issue, information regarding pregnancy in patients with nephrotic syndrome remains limited. Due to the heterogeneity of the underlying causes of the disease, the severity of renal impairment, and differences in patient characteristics, the generalizability of findings from existing studies is limited. In addition, many studies have focused on specific glomerular diseases or small patient populations, and experiences from specialized obstetric centers may provide valuable information regarding the course of care and pregnancy outcomes under real-world clinical conditions. In this context, Sarem Women's Hospital in Tehran, given its provision of specialized services in women's healthcare and pregnancy care, has experience in managing cases of pregnancy complicated by underlying medical conditions. In the present report, two cases of pregnancy complicated by nephrotic syndrome who received care at this center are described in terms of their clinical characteristics, course of pregnancy, maternal and fetal status, and outcomes at delivery. The aim of this report was to present the clinical experience of Sarem Women's Hospital in Tehran in the management of these two

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cases and to assess their maternal and neonatal outcomes.

Case Presentation

Case 1

The first patient was a 34-year-old woman who presented to the clinic on May 25, 2020, with a body mass index (BMI) of 22.27. She had been married for three years and had a history of one cesarean delivery on October 4, 2017. Her medical history included hypothyroidism as an underlying condition. The patient had no history of infertility or consanguineous marriage with her husband and had one daughter from her current marriage. Normal sexual intercourse was reported, and the contraceptive method used was withdrawal. Breast examination was normal. Menarche occurred at the age of 15 years, and menstrual cycles were reported to be regular, lasting 3–7 days with a 40-day interval. Amenorrhea and dysmenorrhea were also documented in the medical record; however, there was no history of spotting, and the amount of menstrual bleeding was reported to be normal. The patient also experienced premenstrual syndrome.

In the current pregnancy, the patient was admitted at 36 weeks and 2 days of gestation for cesarean delivery because of intrauterine growth restriction (IUGR) and abnormal fetal Doppler findings. The pregnancy had been reported as normal up to that point, and prenatal screening tests and fetal echocardiography were normal. Maternal nephrotic syndrome was also documented in the medical record. Cesarean delivery was performed, and a male infant was born with Apgar scores of 10 and 9 and a birth weight of 2,410 g. The infant's length was 46 cm, head circumference was 33 cm, and chest circumference was 31 cm. The infant's heart rate was 148 beats per minute.

Case 2

The second patient was a 30-year-old woman who presented to the clinic on May 10, 2020, with a BMI of 24.91 and blood group O negative. She had no history of consanguineous marriage with her husband, and no history of infertility was reported. Her medical history included thalassemia minor in both the patient and her husband, as well as a history of preeclampsia in a previous pregnancy. A history of vaginal delivery at 26 weeks of gestation and intrauterine fetal death (IUFD) in a previous pregnancy was also documented. The patient had one daughter and used withdrawal as a contraceptive method.

The current pregnancy occurred spontaneously, and chorionic villus sampling (CVS) and prenatal screening tests were reported to be normal. A cervical cerclage had been performed for the patient. The medical record also indicated that the patient had been infected with COVID-19 five months prior to presentation. Because of her underlying condition, she had been under nephrological follow-up since her previous pregnancy. During the pregnancy, she received aspirin and enoxaparin and received Rho (D) immune globulin (RhoGAM) on four occasions. The patient was admitted on September 23, 2020, at 37 weeks of gestation for cesarean delivery. Ultimately, a female infant was born weighing 2,510 g, with Apgar scores of 10 and 9, a length of 47 cm, a head circumference of 33 cm, and a chest circumference of 30 cm. The neonate's general condition after birth was reported to be favorable. A respiratory rate of 45 breaths per minute and a heart rate of 145 beats per minute were recorded.

Discussion

Nephrotic syndrome during pregnancy is an important and relatively complex clinical condition that may pose challenges in the management of both the mother and fetus. The presence of proteinuria and abnormalities associated with glomerular diseases in a pregnant woman, in addition to its importance with regard to maternal health, may be associated with an increased risk of adverse pregnancy outcomes. On the other hand, the occurrence of certain pregnancy complications, including hypertension, preeclampsia, and intrauterine growth restriction, may complicate the assessment of maternal and fetal status and decision-making regarding continuation of pregnancy or the timing of delivery. This issue becomes particularly important when nephrotic syndrome coexists with other obstetric risk factors. Under such circumstances, patient management requires simultaneous assessment of maternal renal status, pregnancy-related conditions, fetal growth and well-being, and determination of the appropriate timing of delivery. Furthermore, a history of severe pregnancy complications in previous pregnancies may increase the need for closer maternal monitoring.

The aim of this report was to describe the experience of Sarem Women’s Hospital in Tehran in the management of two pregnancies complicated by nephrotic syndrome and to evaluate their pregnancy courses and neonatal outcomes. The significance of this report lies in the fact that, despite the presence of underlying disease and different risk factors, both patients received appropriate care and their pregnancies were continued until the final stages. In the first case, intrauterine growth restriction and abnormal fetal Doppler findings led to hospitalization and cesarean delivery at 36 weeks and 2 days of gestation, whereas in the second case, the patient, who had a history of preeclampsia in a previous pregnancy and was under nephrological follow-up, underwent cesarean delivery at 37 weeks of gestation.

In the present report, two cases of pregnancy complicated by nephrotic syndrome were evaluated. Both patients ultimately underwent cesarean delivery, and favorable neonatal outcomes were reported in both cases. However, the clinical circumstances leading to termination of pregnancy were not identical in the two patients. In the first case, the patient was admitted at

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36 weeks and 2 days of gestation because of intrauterine growth restriction (IUGR) and abnormal fetal Doppler findings. Despite the reported normal course of pregnancy and normal prenatal screening tests up to that point, these fetal findings indicated the need for pregnancy termination. A male infant weighing 2,410 g was delivered with Apgar scores of 10 and 9. In the second case, the patient had a history of preeclampsia in a previous pregnancy and was under nephrological follow-up during pregnancy. She received aspirin and enoxaparin and was admitted at 37 weeks of gestation for cesarean delivery. A female infant weighing 2,510 g was delivered with Apgar scores of 10 and 9, and her general condition after birth was reported to be favorable. Overall, in both cases, pregnancy continued until the late third trimester, and both pregnancies resulted in live births. In the first case, IUGR and abnormal fetal Doppler findings were important factors leading to termination of pregnancy, whereas in the second case, despite a high-risk obstetric history and nephrological follow-up, pregnancy continued until 37 weeks. This difference in the clinical course of the two patients suggests that decisions regarding continuation of pregnancy and the timing of delivery in patients with nephrotic syndrome should be based on the individual maternal and fetal clinical conditions, and the diagnosis of nephrotic syndrome alone should not be used as the sole basis for determining the timing of delivery. However, because the available medical records did not include complete laboratory data, the degree of proteinuria, renal function, blood pressure, serum albumin levels, the type of glomerular disease, or complete details of treatment, it is not possible to draw conclusions from these two cases regarding the relationship between the severity of nephrotic syndrome and pregnancy outcomes or the effectiveness of any specific therapeutic approach.

Siligato et al., in 2020, in a study entitled Maternal and Fetal Outcomes of Pregnancy in Nephrotic Syndrome Due to Primary Glomerulonephritis, reviewed maternal and fetal outcomes among pregnant women with nephrotic syndrome secondary to primary glomerular diseases [19]. The authors reviewed the available literature and showed that renal function, blood pressure, and particularly the degree of proteinuria were among the most important factors associated with adverse pregnancy outcomes. They also reported that preterm birth and cesarean delivery were more frequent among patients with kidney disease than in the general population, and that pregnancy outcomes varied according to the type of glomerular disease. The authors emphasized that nephrotic syndrome alone should not be considered an absolute contraindication to pregnancy; however, these patients require risk assessment and careful maternal and fetal follow-up [19]. The findings of the present report are consistent with those of Siligato et al. in that both patients with nephrotic syndrome were able to continue their pregnancies until the late third trimester and ultimately had live births. In the first case, pregnancy continued to 36 weeks and 2 days, and in the second case, to 37 weeks, with both neonates having Apgar scores of 10 and 9. This finding may be consistent with the view that nephrotic syndrome does not necessarily preclude achieving a live birth. However, an important difference is that IUGR and abnormal fetal Doppler findings were observed in the first case of the present report, and these findings were among the main factors leading to hospitalization and termination of pregnancy, whereas no such complication was documented in the second case. Because information regarding the degree of proteinuria, renal function, and blood pressure was unavailable in the present medical records, it cannot be determined whether these factors contributed to the development of IUGR in the first case.

Blom et al., in 2017, conducted a systematic review of studies concerning pregnancy and glomerular diseases and evaluated pregnancy outcomes in women with primary glomerular diseases [20]. This review included 18 studies involving 887 women and 1,414 pregnancies. The authors reported that although live birth was possible in many women with glomerular diseases, the risk of adverse maternal and fetal outcomes was increased, particularly in the presence of active disease, hypertension, impaired renal function, and significant proteinuria [20]. Intrauterine growth restriction and preterm birth were also among the important adverse outcomes reported in these patients. The findings of the present report are consistent with this review in several respects. Both cases in the present report resulted in live births, while IUGR and abnormal fetal Doppler findings were observed in the first case. Thus, the occurrence of a fetal complication alongside a live birth is compatible with the range of outcomes reported in studies of glomerular diseases. On the other hand, both pregnancies in the present report continued into the final weeks of pregnancy, and no fetal or neonatal death was documented in the available records. The differences observed compared with some previous studies may be partly attributable to differences in the type and severity of glomerular disease, renal function, the presence or absence of hypertension, and the degree of proteinuria. However, additional clinical and laboratory data would be required to determine the specific reasons for these differences in the present patients.

Marinaki et al., in 2022, conducted a single-center study entitled Pregnancy in Women with Preexisting Glomerular Diseases: A Single-Center Experience to investigate pregnancy outcomes in women with preexisting glomerular diseases [21]. In this study, among patients with controlled kidney disease and preserved renal function, renal function and proteinuria generally remained stable throughout pregnancy. The incidence of preeclampsia was 6.7%,

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and disease relapse occurred in 6.9% of pregnancies [21]. The authors concluded that, when the underlying disease is quiescent and renal function is preserved, pregnancy may be associated with a relatively low frequency of major adverse events.

The findings of the present report are consistent with this study in terms of the possibility of continuing pregnancy until the late third trimester and achieving live birth in both patients. In the second case, the patient continued her pregnancy until 37 weeks despite a history of preeclampsia in a previous pregnancy and ongoing nephrological follow-up, and a female infant weighing 2,510 g was delivered with Apgar scores of 10 and 9. However, this similarity cannot be directly attributed to adequate control of kidney disease because data regarding renal function, proteinuria, and disease status throughout pregnancy were not available in the present medical records. Therefore, the present report represents primarily a clinical observation of the outcomes of two patients and has limitations in terms of direct comparison with a cohort study.

Blom et al. also emphasized in their systematic review that close maternal and fetal monitoring and early identification of signs of maternal or fetal deterioration are essential in women with glomerular diseases. They specifically highlighted the association of kidney disease, hypertension, and proteinuria with outcomes such as fetal growth restriction and preterm birth [20]. This issue can be compared with the course of the first case in the present report, in which the identification of IUGR and abnormal fetal Doppler findings at 36 weeks and 2 days led to termination of pregnancy by cesarean delivery, and the neonate was born with favorable Apgar scores. Thus, although no conclusion can be drawn from these two cases regarding the effectiveness of a specific management approach, the observed clinical course highlights the importance of monitoring fetal growth and assessing fetal well-being when determining the timing of delivery.

Sebestyen et al., in 2008, described the successful management of pregnancy in a patient with severe nephrotic syndrome due to membranous glomerulonephritis in a case report [22]. In that patient, worsening renal function, decreased serum protein levels, increasing edema, and progressive intrauterine growth restriction led to cesarean delivery at 33 weeks of gestation [22]. This case demonstrated that, in severe disease, maternal and fetal conditions may be decisive in determining the timing of delivery. The case report has notable similarities to the first case in the present report because IUGR was an important finding during pregnancy in both cases, and cesarean delivery was ultimately performed during the third trimester. However, an important difference is that in the report by Sebestyen et al. [22], the severity of renal disease was documented by findings such as reduced creatinine clearance, decreased total serum protein, and increased edema, whereas such information was not available in the medical record of the first patient in the present report. In addition, delivery in the present case occurred at 36 weeks and 2 days, which was later than the 33-week delivery reported by Sebestyen et al. This difference may have resulted from variations in the severity of the underlying disease, maternal condition, severity of fetal growth restriction, and overall fetal status; however, without complete clinical data for the present patient, a specific explanation for this difference cannot be established.

Conclusion

Overall, the available literature indicates that pregnancy outcomes in women with nephrotic syndrome and glomerular diseases do not depend on a single factor. Renal function, the degree of proteinuria, blood pressure, disease activity, and fetal status all contribute to pregnancy outcomes. The two cases presented here also achieved live births but did not follow identical clinical courses. In the first case, IUGR and abnormal fetal Doppler findings led to termination of pregnancy at 36 weeks and 2 days, whereas the second pregnancy continued to 37 weeks without documentation of these complications. This difference between the two patients emphasizes the importance of individualized assessment and continuous monitoring of maternal and fetal conditions during pregnancies complicated by nephrotic syndrome.

Ethical Considerations

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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