

## Opinion

### Pregnancy may be an Opportunity to Diagnose Kidney Disease

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#### Abstract

During pregnancy there is a renal adaptation that can interfere in glomerular physiology and the manifestation or exacerbation of glomerulopathies may be the result of this period. Women diagnosed with glomerulopathies who become pregnant are not only subject to worse fetal and maternal prognosis, but also to develop long-term chronic kidney disease resulting from some obstetric complications. There is a shortage of studies that contribute to optimize medical follow-up with nephrologists and obstetricians from preconception to the postpartum period, contributing to early diagnosis and preventing the progression of renal dysfunction.

**Keywords:** Glomerulonephritis; High-Risk; Kidney diseases; Preconception care; Pregnancy outcome; Pregnancy

#### Introduction

Since the beginning of pregnancy the maternal urinary system undergoes some functional and anatomical adaptations, such as the increase of glomerular filtration rate, low systemic vascular resistance and thus, decrease of serum creatinine and urea levels [1]. Another alteration found in normal pregnancy is the increase of urinary excretion of proteins, which is mostly Tamm-Horsfall; however, proteinuria, such as albuminuria, at high levels seems to be the main cause of renal disease progression in this period especially when associated with pre-eclampsia. This relationship is similar to that in type 1 diabetes mellitus and may be directly associated with adverse maternal and perinatal outcomes [2]. In the long term, there is also an increased risk of women who had pre-eclampsia have persistent proteinuria after delivery, perhaps this may be related to the coexistence of not previously diagnosed glomerulopathy [3]. Women who become pregnant with pre-diagnosed glomerulopathy and normal renal function appear to have no worsening of the kidney disease after childbirth in most cases, different from that observed in those who have become pregnant with moderate or severe kidney deficit that often have deterioration of renal function after pregnancy, especially when associated with high blood pressure and proteinuria [4]. The follow-up of women with glomerulopathies who become pregnant

is difficult for both the nephrologist and the obstetrician, not only because it is a high-risk pregnancy, but also because of the scarcity of information in the literature and the diversity of diseases that may be involved.

#### Discussion

Pregnancy associated with kidney disease requires differentiated medical care, especially when the disease is already in advanced stages due to the risk of a worse maternal-fetal outcome [5]. Preconception counseling and nephrological assessment months before pregnancy can optimize the course of pregnancy and renal function, so the multidisciplinary follow-up of women with glomerulopathies who intend to become pregnant is as important as of those who have already become pregnant [6]. There is no doubt that studies in the literature can contribute to a better understanding of the course of glomerulopathies in pregnancy and how to manage it. It is remarkable that most of them describe adverse pregnancy outcomes as shown below. A retrospective study of 80 pregnant women with chronic kidney disease found renal function impairment after pregnancy and higher incidence of pre-eclampsia, anemia and fetal complications in the advanced stages of the kidney disease [7].

Another retrospective study of 238 women with glomeropathies and who became pregnant showed high perinatal mortality, especially in those who had renal function deterioration, high blood pressure or nephrotic syndrome [8]. A retrospective

analysis of 148 pregnant women with glomerulopathies observed a worse fetal prognosis in the presence of uncontrolled blood pressure, nephrotic proteinuria or serum creatinine above 1.8 mg/dL [9]. Another retrospective study compared 778 pregnant women with and without kidney disease and observed a higher incidence of preterm birth, cesarean section, pre-eclampsia, eclampsia, days of hospitalization and maternal death [10]. When pregnancy occurs during glomerulopathy with mild or moderate kidney dysfunction, it does not appear to have additional deleterious effects on the underlying disease [11], differently from that observed when loss of renal function is already important before conception [12]. Therefore pregnancy should not be stimulated in such cases or those women should at least be clearly informed about the risks [13]. Regarding women who have received kidney transplantation, if they do not have significant changes in renal function they may become pregnant, but it is recommended to observe two important markers at the time of conception related to maternal-fetal prognosis, the degree of renal dysfunction and high blood pressure [14].

Glomerulopathies can sometimes manifest for the first time in pregnancy. Therefore pregnant women should be screened for the presence of chronic kidney disease since the first prenatal visit, allowing better management of pregnancy and also because the differential diagnosis between chronic kidney disease and pre-eclampsia may be difficult [15]. There are many types of glomerulopathies and some cause particular concern in pregnancy such as membranoproliferative glomerulonephritis, IgA nephropathy, segmental and focal glomerulosclerosis, and lupus nephritis [16]. The membranoproliferative glomerulonephritis in pregnancy is often associated with deterioration of renal function and high blood pressure, pre-eclampsia, and fetal loss [17]. IgA nephropathy may have a decrease in renal function with partial reversion after delivery, high blood pressure, deterioration of kidney function and even fetal loss, but in most cases pregnancy does not appear to have a deleterious effect on the course of the disease [18]. In segmental and focal glomerulosclerosis there may be a transient increase in proteinuria and blood pressure levels, worsening of kidney injury and fetal loss in a few cases, but after pregnancy there is a high risk of progression to end-stage chronic kidney disease [19]. Reactivation of systemic lupus erythematosus is common during pregnancy, as well as increase of blood pressure levels, pre-eclampsia, increased risk of fetal loss, and deterioration of renal function when lupus is diagnosed after conception or when it occurs during its activity [20].

Diabetic nephropathy usually has a favorable course in pregnancy in most cases, although worsening of proteinuria and high blood pressure is frequently observed [21]. A difficulty in the diagnostic elucidation of glomerulopathies during pregnancy is that kidney biopsy should be avoided; however, in cases of progressive

and sudden worsening of renal function with no apparent cause, as in rapidly progressive glomerulonephritis, it may be necessary for the initiation of treatment [22]. The follow-up of women with glomerulopathies who become pregnant is difficult for nephrologist and obstetrician, not only because it is a high-risk pregnancy, but also because of the scarcity of information in the literature and the diversity of pathologies that may be involved. In addition, there are some peculiarities related to the woman who becomes pregnant and may influence the management of the glomerulopathies, such as the teratogenicity of some medications, dietary restrictions and the physiological changes of the urinary tract and obviously the risks involving the fetus. Women who become pregnant with pre-diagnosed glomerulopathy and normal renal function appear to have no worsening of the disease after childbirth, differently from those already pregnant with moderate or severe deficits, which usually have deterioration of renal function after pregnancy, especially when there is association of hypertension and proteinuria [4].

Pregnancy in advanced stages of kidney disease is an even more troubling condition for the physician and is often associated with a worse fetal maternal outcome. Counseling preconception and nephrological evaluation months before pregnancy can optimize the course of pregnancy and renal function, so the multidisciplinary follow-up of women with glomerulopathies who intend to become pregnant is as important as of those who have already become pregnant. As previously discussed, there are studies associating pregnancy and chronic kidney disease in women with worsening of renal function and higher incidence of pre-eclampsia, increased perinatal mortality, increased risk of maternal death and even deleterious renal effects in the long term postpartum in women who had pregnancy-induced hypertension syndrome [23].

When pregnancy occurs during glomerulopathy with normal or mildly altered renal function, it does not appear to have additional deleterious effects on the underlying disease, differently from that observed when the loss of renal function is already important before conception. Therefore, pregnancy should not be recommended for women with chronic kidney disease with altered glomerular filtration rate. With respect to chronic kidney disease, women have different manifestations and complications when compared to men, because their illness can interfere with future generations, either because of the risks transmitted to the offspring or their role in the family structure. Pregnancy is undoubtedly a period that deserves special attention because it may be an opportunity to diagnose a kidney disease, which may only be manifested or worsened because the woman became pregnant [24].

## Conclusion

There are few published studies that assess the impact of pregnancy on glomerulopathies and there is much difficulty in analyzing the results in many of them because they include

different stages of chronic kidney disease and types of glomerular disease, as well as stages of pregnancy. There is no doubt that this peculiar period in the life of women influences the course of glomerulopathies, but there is still a shortage of information about this relationship that would contribute to medical management by nephrologists and obstetricians.

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