

## Managing Pregnancy after Kidney Transplantation is Still Challenging

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**Citation:** Facca TA, Passos MT, Famá EAB, Sato JL, Sass N, et al. (2019) Managing Pregnancy after Kidney Transplantation is Still Challenging. J Surg 4: 1265. DOI: 10.29011/2575-9760.001265

**Received Date:** 18 November, 2019; **Accepted Date:** 23 November, 2019; **Published Date:** 29 November, 2019

According to the latest report of the Global Observatory on Donation and Transplantation, in collaboration with the World Health Organization, there were more than 90 thousand kidney transplantations performed worldwide in 2017 [1]. Kidney transplantation is by far the most frequently carried out transplantation globally, approximately 65%, followed by liver transplantation, 23%. Spain, France and the United States of America are the countries that most transplanted kidney. In this period, about  $\geq 50$  transplants per million populations [2]. Kidney transplantation is the best treatment for patients with End-Stage Renal Disease (ESRD), although many complications are often related to this medical procediment such as graft rejection or delayed graft function and immunosuppressive therapy with several side effects. Assessing the function of the graft is very important for optimal graft survival. Decreased diuresis and impaired serum creatinine levels are frequently signs of graft dysfunction. Recognizing the cause of graft dysfunction and identifying the toxicity of immunosuppressive drugs are still challenging for physicians [3]. One of the known consequences of ESRD is infertility.

Women may have 10-fold reduced fertility in this stage of the disease, but after a successful kidney transplantation the fertility is usually restored. Pregnancy is not contraindicated for women with kidney transplantation, but it certainly demands medical attention because of the many risks involved [4]. Pregnancy normally causes morphological and functional changes in renal function. However, the effects of pregnancy on glomerular disease progression and graft survival is controversial. Anyway, the risk of perinatal mortality and morbidity is certainly increased [5]. Those pregnancies carry high risk of infection, proteinuria, anaemia, hypertension, acute graft rejection, postpartum graft loss, low birth weight, miscarriage, new born death, preeclampsia, gestational diabetes, caesarean and preterm delivery. Moreover, the pregnancy may change the pharmacokinetics of many drugs

used after kidney transplantation [6]. Some authors have identified decline in renal function in pregnant women in the first year after kidney transplantation [7] and there is evidence that sustained increased serum creatinine levels during and after pregnancy are related to a higher risk of long-term graft loss [8]. Those facts help explain why women should wait to become pregnant after kidney transplantation and require multidisciplinary monitoring.

According to the European Renal Union and European Dialysis and Transplantation Association, five criteria should be followed by women with kidney transplantation before pregnancy: wait at least two years after kidney transplantation, have stable renal function with serum creatinine level  $< 2$  mg/dl (better  $\leq 1.5$  mg/dl), have no recent episodes of acute graft rejection, maintain blood pressure 140/90 mmHg on medication, proteinuria  $< 500$  mg/day and have normal graft ultrasound [9]. Because of the teratogenicity of some drugs and other effects, some protocols include stopping tacrolimus, mycophenolate mofetil and corticosteroid three months before the pregnancy and adding azathioprine instead of mycophenolate mofetil [6]. Despite the advance of medicine, it is still difficult to study the impact of pregnancy on kidney transplantation because there are a lot of variables involved as different stages of chronic kidney disease, types of glomerular disease, stages of pregnancy, types of immunosuppressive therapy, demographic diversity and differences in medical follow-up among countries. Pregnancy may promote renal and cardio metabolic overload in women and may have also lasting effects that remain silent for years [10]. There are many reports of successful pregnancies after kidney transplantation, although complications are frequent compared to the general population as cited before. The patient counselling in those cases should start years before pregnancy to avoid some common obstacles and also help in clinical decision making. There is no doubt that pregnancy after kidney transplantation should be followed by a multidisciplinary team before, during and after pregnancy, but it still challenging.

### Conflict of interest

None.

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