Pregnancy and Kidney Transplantation, Triple Hazard? Current Concepts and Algorithm for Approach of Preconception and Perinatal Care of the Patient With Kidney Transplantation

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ABSTRACT

Introduction. Kidney transplantation (KT) increases fertility in patients with chronic kidney disease (CKD); their pregnancies are considered of high risk because of higher incidence of complications. The objective of this study was to propose, based on current concepts, an algorithm for preconception and perinatal care of KT recipients with a desire for parity.

Materials and Methods. We searched for literature published within the last 10 years related to pregnancy and KT. Based on the results, we developed an algorithm for the approach to preconception/perinatal care of these patients.

Results. Preconception care begins with pre-KT study of women of childbearing age, continues with contraception, and ends with the proper selection of candidates; an exhaustive study of health condition, function of renal graft, and infections that may affect the fetus is required; fetotoxic drugs must be suspended, immunosuppression must be based in corticosteroids, azathioprine, and tacrolimus or cyclosporine. Once conception is achieved, prenatal care should be done by a multidisciplinary team; follow-up of graft function and maternal-fetal health must be strict. Pregnancy has no deleterious effect on graft function; pelvic localization of graft does not contraindicate vaginal delivery; breastfeeding is indicated if immunosuppressive levels in the newborn are low.

Conclusions. KT returns the possibility of motherhood to women with CKD. Proper selection and optimal care of patients determines success in maternal, fetal, and graft results.

WOMEN with chronic kidney disease (CKD) present dysfunction of the hypothalamus–hypophysis–ovarian axis, reflected in abnormalities of the menstrual cycle, which is anovulatory in most cases, leading to decreased fertility [1,2]. Management of CKD with dialytic therapy increases survival rate, but infertility persists [3]. Kidney transplantation (KT) has become the best choice for young patients with CKD [4] because it increases reproductive function [5] in those women who wish for motherhood [2]. The first successful pregnancy in a KT recipient was reported in 1956 [6]; since then, a great number of women with previous KT have been able to get pregnant [7]. However, they have a higher incidence of preeclampsia, gestational diabetes, preterm delivery, and intrauterine growth restriction, compared with the general population [5]; furthermore, the fetus is exposed to immunosuppressive agents and other drugs given to the mother, and the graft overcomes typical changes of pregnancy. Despite this, with proper selection and adequate care, most pregnancies conclude successfully. Although pregnancy after solid organ transplantation is frequent, literature is limited [8].

MATERIALS AND METHODS

Embase, Medline, and Lilacs databases were consulted; MeSH and DeCS terms used for search were "Pregnancy," "Kidney Transplantation," "Pregnancy Outcome," "Breastfeeding," and "Prenatal

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Table 1. Davison Criteria (Pregestational Guide for Patients With KT)

1. Good health condition at least 2 years after transplant
2. Absent or minimal proteinuria (<500 mg per day)
3. Absent or mild hypertension (<140/90 mm Hg) controlled with monotherapy
4. Stable renal function with serum creatinine <1.5 mg/dL
5. No recent episodes of acute rejection within the previous 6 months
6. Graft ultrasound negative for pielocalicial dilation
7. Maintenance dose for immunosuppression with prednisolone <15 mg per day, azathioprine <2–3 mg/kg per day, and/or cyclosporine <4 mg/kg per day

Care," we limited our search to literature published in English or Spanish within the last 10 years, albeit 6 articles published in previous dates were included. All documents were reviewed and organized according to clinical relevance. Finally, we elaborated an algorithm for preconception and perinatal care of the patient with previous KT based on search results.

RESULTS

KT brings back the possibility of motherhood for women of childbearing age with CKD [9]. Counseling upon pregnancy must be given by a multidisciplinary team led by an obstetrician and a specialist in transplantation. It is an ethical responsibility of the medical team to explain possible risks and special care required, and to respect the patient's decision [10].

The pretransplantation study is the right time to identify women of childbearing age (15 to 44 years old according to the World Health Organization). These patients must be vaccinated against rubella because once immunosuppression starts, live virus vaccines are contraindicated [8,11].

Unplanned pregnancies occur in 1 in 200 premenopausal patients in dialytic therapy [9]; also, pregnancies have been reported in the peritransplantation period, when fetotoxic drugs, such as immunosuppressives in high doses, are widely used [5,8]. Counseling on contraception must be given previous to KT, given that unplanned pregnancies rates up to 50% have been reported [2,12]. An intrauterine device is the contraceptive of choice because of its high effectiveness and absence of drug interactions; however, hormonal methods can be used [13]. Barrier methods are recommended [12,13], being the only ones that prevent against sexually transmitted diseases [14].

Optimal transplantation-to-conception time is 1 [5,15] to 2 years [8,11], in order to guarantee proper graft function, lesser incidence of opportunistic infections such as cytomegalovirus (CMV) [9], and immunosuppression in the maintenance phase. However, if presented earlier, termination of pregnancy is not indicated [16]. Ideally, the waiting time should be less than 5 years to avoid permanent deterioration of renal function due to chronic rejection [1,17].

In 1997, Davison proposed criteria that have been useful to achieve optimal pregnancy results [11,18–20] for selection of patients with previous KT who wish for motherhood (Table 1). Once a patient is considered an optimal candidate for pregnancy, fetotoxic drugs as mycophenolate mofetil (MMF), angiotensin converting enzyme (ACE) inhibitors, and angiotensin receptor antagonists (ARA), must be suspended at least 6 weeks before conception [21,22]. It

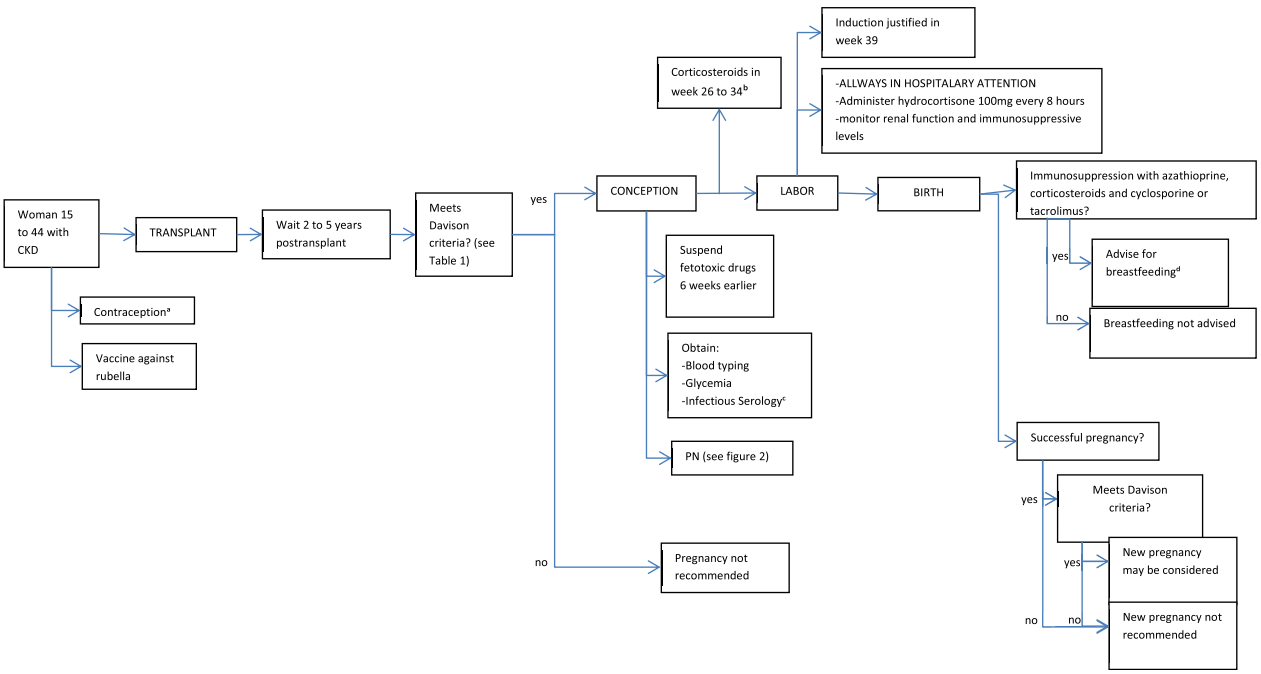

Fig 1. Perinatal care of KT recipient. [a]Intrauterine device is the method of choice. [b]For fetal lung maturation. [c]Includes hepatitis B and C, CMV, toxoplasmosis, rubella, and HIV. [d]With immunosuppressive levels in the newborn. Abbreviations: CKD = chronic kidney disease; PN = prenatal control; CMV = cytomegalovirus.