

Pregnancy Outcome in Kidney Transplant Patients

Fakhrolmolouk Yassaee, Farnaz Moshiri

Introduction: Advances in surgical techniques and immunosuppressive therapy have improved the survival and quality of life in organ transplant patients. Thus, the number of organ transplant women at their reproductive age has also increased. We sought to investigate the allograft and obstetric outcomes in pregnant kidney recipients.

Materials and Methods: Seventy-four kidney recipient women with 95 conceptions during their posttransplant period were evaluated. Pregnancy outcome, kidney allograft function, and maternal, fetal, and neonatal complications were evaluated in these patients.

Results: The mean interval between kidney transplantation and pregnancy was 41.0 ± 9.5 months. Twenty-three pregnancies (24.2%) were unsuccessful due to abortion and stillbirth. The mean birth weight was 2385.0 ± 161.7 g and 45 newborns (62.5%) had a birth weight less than 2500 g (low birth weight). The mean Apgar score of the live babies was 7.9 ± 0.7 . Forty-four (61.1%) babies were admitted to neonatal intensive care unit and early neonatal death happened in 4 (5.5%). Fifteen mothers (15.78%) had an uneventful perinatal period. The most common maternal complications in the 95 pregnancies were anemia in 62 (65.3%) and preeclampsia in 45 (47.4%). Three patients 3 (3.2%) lost their graft and 6 (6.3%) had impaired kidney allograft function 2 years after pregnancy.

Conclusion: Pregnant kidney allograft recipients should be considered as high-risk patients needing special care under the supervision of a team of obstetricians and nephrologists.

Keywords: kidney transplantation, pregnancy, complications, allograft dysfunction, live birth

*Urol J (Tehran). 2007;4:14-7.
www.uj.unrc.ir*

Department of Obstetrics and Gynecology, Perinatology Center, Taleghani Hospital, Shaheed Beheshti University of Medical Sciences, Tehran, Iran

*Corresponding Author:
Fakhrolmolouk Yassaee, MD
Department of Obstetrics and Gynecology,
Taleghani Hospital, Velenjak,
Tehran, Iran
Tel: +98 21 2240 0205
Fax: +98 21 2240 3694
E-mail: dr_fyass@yahoo.com*

*Received April 2006
Accepted October 2006*

INTRODUCTION

In the past, pregnancy was considered to be a serious hazard after kidney transplantation, especially because of possible side effects of the immunosuppressive drugs on the development of fetus and the risk of worsening of the mother's kidney function. Now, the number of the papers reporting successful pregnancies in kidney-transplanted mothers is increasing.

Ovarian dysfunction, anovulatory vaginal bleeding, amenorrhea, high prolactin levels, and loss of libido are the causes of infertility

in women with chronic kidney failure. Endocrine function generally improves after recovery of the kidney allograft function.⁽¹⁾ Reportedly, fertility rate, being 1:200 in patients under dialysis, reaches 1:50 in kidney transplant recipients.⁽²⁾ The criteria of a safe pregnancy in kidney-transplanted patients include transplantation at least 1.5 to 2 years before pregnancy,⁽²⁻⁵⁾ good kidney function (serum creatinine level less than 1.5 mg/dL),^(1,5,6) no recent acute allograft rejection,⁽⁶⁾ normal blood pressure or use of minimum dose of antihypertensive drugs,^(1,3,6,7) negative urinary protein or minimum

protein excretion,^(1,3,7) normal kidney allograft on ultrasonography,⁽⁶⁾ prednisolone dose less than 1.5 mg, and cyclosporine dose within the therapeutic level.⁽⁵⁾ Even if all these considerations are followed, pregnancy can be a high-risk condition in kidney allograft recipients. Nonetheless, most authors have reported encouraging obstetrics and graft outcomes.⁽⁵⁻¹⁵⁾ The aim of this study was to investigate pregnancy outcomes and kidney allograft function in 74 female kidney transplant patients.

MATERIALS AND METHODS

In this retrospective study, we reviewed the records of 74 kidney recipient women at their reproductive age (18 to 38 years) who had 95 conceptions during their posttransplant period. Data were collected between 1996 and 2001, from 3 university hospitals with transplant departments in Tehran. All patients had received their kidney allografts from living donors. Pregnancy outcome, kidney allograft function, and maternal, fetal, and neonatal complications were evaluated in these patients. Their kidney allograft function was assessed during the 2 years after pregnancy.

RESULTS

The outcomes of 95 pregnancies were evaluated in 74 kidney transplant women. The mean age of the patients was 29.3 ± 6.7 years (range, 18 to 38 years). The mean interval from kidney transplantation to pregnancy was 41.0 ± 9.5 months (range, 22 to 59 months) and the mean interval from kidney transplantation to delivery was 49.5 ± 10.1 months (range, 30.5 to 68 months). Overall, 17 pregnancies (17.89%) were unplanned, while 25 (26.3%) patients had preconception counseling.

Seventy-two pregnancies (75.8%) ended in live birth and 23 (24.2%) were unsuccessful due to abortion in 21 (91.3%) and stillbirth in 2 (8.7%). Of 21 abortions, 16 (76.2%) were spontaneous and 5 (23.8%) were therapeutic. Fourteen (18.9%) babies were vaginally delivered and the remainders were born through cesarean section (81.1%). The mean birth weight was 2385.0 ± 161.7 g and 45 newborns (62.5%) had a birth weight less than 2500 g (low birth weight). The mean Apgar score of the live babies was 7.9 ± 0.7 . Forty-four (61.1%) babies were admitted to neonatal intensive care unit and early neonatal death

was reported in 4 (5.5%). Table 1 demonstrates the fetal/neonatal complications.

The perinatal period was uneventful in 15 mothers (15.78%). The most common complication was anemia in 62 mothers. Overall, 2 patients (2.7%) lost their graft and 6 (8.1%) had impaired kidney allograft function (serum creatinine > 2 mg/dL) 2 years after pregnancy. Complications in the patients are listed in Table 2.

Table 1. Complications in Fetuses or Neonates of Conceived Kidney Allograft Recipients

Complication	Number (%)
Ectopic pregnancy	0
Abortion	
Spontaneous	16 (16.8)
Therapeutic	5 (5.3)
Stillbirth	2 (2.1)
Preterm delivery	21 (22.1)
Oligohydramnios	4 (4.2)
Intrauterine growth retardation	3 (3.2)
Low birth weight	45 (47.4)
Small for gestational age	6 (6.3)
Congenital abnormality	0
Admission to neonatal intensive care unit	44 (46.3)

Table 2. Complications in Kidney Recipient Mothers and Kidney Allografts*

Complication	Number (%)
Kidney allograft dysfunction	
Graft loss	3 (3.2)
Acute rejection	2 (2.1)
Recurrent glomerulonephritis	1 (1.1)
Allograft dysfunction†	6 (6.3)
Other complications	
Anemia	62 (65.3)
Preeclampsia	45 (47.4)
Aggravation of hypertension	34 (35.8)
Urinary tract infection	16 (16.8)
Obstruction of transplanted ureter	1 (1.1)

*Percents are in proportion to the 95 pregnancies.

†Serum creatinine level greater than 2 mg/dL, 2 years after pregnancy.

DISCUSSION

According to our study, pregnancy in women with kidney transplantation can be safe. This finding is in accordance with the study of Pezeshki and colleagues who concluded that pregnancy was possible and could be safe and successful after kidney transplantation in recipients with normal kidney function.⁽⁸⁾

Deterioration of the kidney function occurred in

only 6 cases (6.31%) within 2 years after the delivery that is in accordance with the studies of O'Connell and coworkers and Rudolph and associates.^(6,7) Even, some studies reported no deterioration of the kidney function.^(1,4,5,9-11) Basaran and colleagues showed that pregnancy had no negative impact on kidney allograft function during a 2-year follow-up and no acute rejection episode occurred in their study.⁽¹⁾ In our study, impaired kidney allograft function and acute rejection occurred in 6 (6.31%) and 2 (2.1%) subjects, respectively. Allograft rejection during or after pregnancy is reported by most studies.^(7,11-15) However, Bar and associates observed no rejection episode during or after conception.⁽³⁾ Rowemeier and colleagues studied 13 pregnant women after kidney transplantation. Their findings indicated that pregnancy after kidney transplantation is associated with a high risk for both mother and child. An irreversible elevation in serum creatinine concentration occurred in 5 women and hypertension aggravated in 8, which was similar to our finding (3.2% graft loss). They concluded that pregnancy requires an intensive joint care between the obstetrician, pediatrician, and nephrologist in these women.⁽¹²⁾

Numerous studies showed that the incidence of spontaneous abortion and preterm deliveries in kidney transplant women was higher than that in healthy individuals. Babies delivered by these patients had a lower birth weight, but no congenital defects were noted.^(1-4,6,7,9-17) In our series, 6 newborns (6.3%) were small for gestational age and 3 (3.2%) had intrauterine growth retardation (IUGR). We did not detect any congenital abnormalities either. Maternal anemia and superimposed hypertension may be the causes of IUGR and low birth weight in these babies.^(9,12-14) These 2 complications were frequent in our patients.

Prematurity is a frequent condition in posttransplant conceptions and is related to kidney dysfunction and the time interval from transplantation to conception. We noted premature rupture of the membranes and preterm deliveries in 21 cases (22.1%), which is in accordance with other studies.^(3,7,8,13,14) As we observed in our patients, the number of admissions to the neonatal intensive care unit would be increased due to preterm deliveries. Little and colleagues found that of 23 live births in transplant cases, 73.9% were

premature, 65.2% were of low birth weight, and 61% were admitted to the neonatal intensive care unit.⁽¹¹⁾ Furthermore, the rate of cesarean section would be increased due to complications such as prematurity, preeclampsia, and IUGR.⁽⁴⁾ In our study, 60 (81.1%) deliveries were performed through cesarean section. Overall, if pregnancy is not desired, effective contraception must be used to prevent unwanted conception.⁽¹⁷⁾

CONCLUSION

Our study confirms that kidney allograft recipients can have a successful pregnancy after transplantation and give birth to healthy infants, but these are to be regarded as high-risk pregnancies and require a multidisciplinary approach.

CONFLICT OF INTEREST

None declared.

REFERENCES

1. Basaran O, Emiroglu R, Secme S, Moray G, Haberal M. Pregnancy and renal transplantation. *Transplant Proc.* 2004;36:122-4.
2. Tommasi GV, Casolino V, Fontana I, et al. [Pregnancy in women undergoing a kidney transplant. Our experience and a review of the literature]. *Minerva Ginecol.* 1996;48:553-6. Italian.
3. Bar J, Wittenberg C, Hod M, et al. Pregnancy outcome in renal allograft recipients in Israel. *Israel J Med Sci.* 1996;32:1183-5.
4. Saito S, Sakagami K, Fujiwara T, et al. Successful pregnancy in renal transplant recipients. *Acta Med Okayama.* 1993;47:347-9.
5. Gaughan WJ, Moritz MJ, Radomski JS, Burke JF Jr, Armenti VT. National Transplantation Pregnancy Registry: report on outcomes in cyclosporine-treated female kidney transplant recipients with an interval from transplant to pregnancy of greater than five years. *Am J Kidney Dis.* 1996;28:266-9.
6. O'Connell PJ, Caterson RJ, Stewart JH, Mahony JF. Problems associated with pregnancy in renal allograft recipients. *Int J Artif Organs.* 1989;12:147-52.
7. Rudolph JE, Schweizer RT, Bartus SA. Pregnancy in renal transplant patients: a review. *Transplantation.* 1979;27:26-9.
8. Pezeshki M, Taherian AA, Gharavy M, Ledger WL. Menstrual characteristics and pregnancy in women after renal transplantation. *Int J Gynaecol Obstet.* 2004;85:119-25.
9. Tan PK, Tan AS, Tan HK, Vathsala A, Tay SK. Pregnancy after renal transplantation: experience in Singapore General Hospital. *Ann Acad Med Singapore.* 2002;31:285-9.

10. Horcickova M, Reneltova I, Simova M, et al. [Pregnancy after kidney transplantation]. *Vnitr Lek*. 1999;45:224-7. Czech.
11. Little MA, Abraham KA, Kavanagh J, Connolly G, Byrne P, Walshe JJ. Pregnancy in Irish renal transplant recipients in the cyclosporine era. *Ir J Med Sci*. 2000;169:19-21.
12. Rowemeier H, Kemmer FW, Somville T, Grabensee B. [Pregnancy after kidney transplantation]. *Dtsch Med Wochenschr*. 1993;118:649-55. German.
13. Miniero R, Tardivo I, Curtoni ES, et al. Pregnancy after renal transplantation in Italian patients: focus on fetal outcome. *J Nephrol*. 2002;15:626-32.
14. Tardivo I, Curtoni ES, Segoloni GP, Dall'Omo AM, Miniero R. [Pregnancy after kidney transplantation. Review of the international literature and presentation of personal case reports]. *Minerva Urol Nefrol*. 2002;54:119-26. Italian.
15. Pour-Reza-Gholi F, Nafar M, Farrokhi F, et al. Pregnancy in kidney transplant recipients. *Transplant Proc*. 2005;37:3090-2.
16. Haugen G, Fauchald P, Sodal G, Halvorsen S, Oldereid N, Moe N. Pregnancy outcome in renal allograft recipients: influence of ciclosporin A. *Eur J Obstet Gynecol Reprod Biol*. 1991;39:25-9.
17. Lessan-Pezeshki M, Ghazizadeh S, Khatami MR, et al. Fertility and contraceptive issues after kidney transplantation in women. *Transplant Proc*. 2004;36:1405-6.