

# ANESTHETIC AND PERIOPERATIVE MANAGEMENT OF A PARTURIENT AFTER KIDNEY TRANSPLANT

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## INTRODUCTION

Pregnancy following renal transplant is considered a high-risk pregnancy, and it requires a multi-team management by anesthesiologists, transplant physicians, obstetricians and neonatologists in order to prevent adverse maternal and fetal outcomes. Published data on anesthetic management of such patients is limited. We report a successful cesarean delivery under combined spinal-epidural anesthesia, of a parturient with a history of systemic lupus erythematosus that had multiple pregnancies after kidney transplant.

## CASE REPORT

A 29-year-old female G6 P3 was admitted to the department at 37 weeks of gestation for a repeat semi-elective cesarean section, due to two previous caesarean sections. The patient was a recipient of a living-male donor kidney, and she had conceived three times after the kidney transplant, which took place 7 years prior. Her renal functioning had been stable pre-pregnancy and throughout the pregnancy with a creatinine level of 1.1 mg/dL. During the pregnancy, she was maintained on Tacrolimus and Prednisone for immunosuppression and did not require any antihypertensive therapy. The patient had a history of systemic lupus erythematosus that had been in remission. Her laboratory tests were normal except for anemia and an elevated titer of Anti DS DNA Abs. The anesthesia team decided to proceed with combined spinal epidural anesthesia. Intrathecal bupivacaine 0.75% 1.6 ml and fentanyl 20 µg were used. Intravenous fluid administration was guided by estimated blood loss, arterial blood pressure, and urine output. A healthy male infant was delivered with APGARS 8/9 via high transverse uterine incision. Post-operatively, the patient developed transient oliguria, and her creatinine level started to rise, reaching 1.5 mg/dL by post-operative day 2. Due to a worsening anemia, with a hemoglobin level of 6 g/dL, the patient was transfused with 3U PRBCs, which restored her hemoglobin to 10 g/dL. Immunosuppression was maintained with Tacrolimus and Prednisone daily, and post-delivery Tacrolimus level was checked to be therapeutic. Patient and baby were safely discharged home on post-operative day 4.

## DISCUSSION

Data from U.K. Transplant Pregnancy Registry and multiple case-controlled retrospective studies revealed that rates of pre-term delivery in renal transplant recipients are much higher than that of the general population (50% in contrast to 7%), with 80% of the preterm infants delivered via caesarean.<sup>1,2</sup> Anesthesiologists managing such parturients need to be aware that the most frequent indications for caesarean among preterm deliveries are hypertension, preeclampsia and deteriorating renal function. Fetal complications such as prematurity and low fetal birth weight are almost inevitable consequences of preterm delivery. Pregnancy also may have a harmful effect on renal function when substantial renal dysfunction existed before the pregnancy. Immunosuppressive therapy in pregnant renal transplant recipients undergoing cesarean delivery should be continued during the perioperative period in order to prevent graft rejection. Side effects of immunosuppressive medications, as well as interactions between immunosuppressive and anesthetic drugs, may have a direct impact on the choice of anesthetic technique to be used. If an epidural or spinal technique is planned, clotting studies and platelet count should be normal. In the puerperium, renal function, proteinuria, blood pressure, steady state of immunosuppressive medications blood levels and fluid balance should be closely monitored. The goal of the anesthetic management is to provide for a hemodynamically stable and comfortable patient and to avoid nephrotoxic drugs. Blood bank and transplant surgery should be informed and be immediately available in the event of an accidental injury to the transplanted kidney, as significant blood loss can occur posing a threat to the fetus, the mother, and the graft.

## Obstetric Data (U.K.)

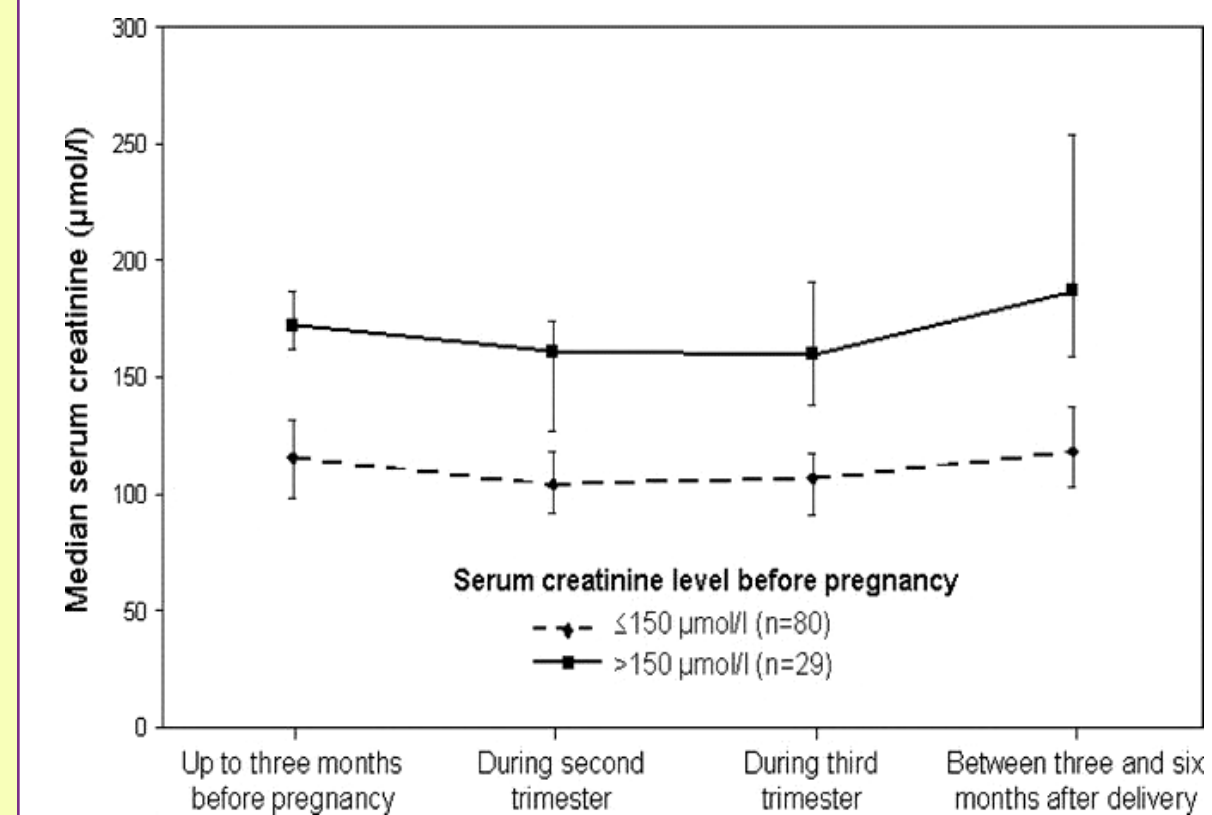
TABLE 1. Pregnancy outcomes and obstetric data for cardiothoracic, liver, and kidney transplant recipients

	Cardiothoracic recipients	Liver recipients	Kidney recipients
Number of patients	17	16	176
Number of pregnancies	18	18	193
Pregnancy outcomes (n <sup>a</sup> )	18	16	188
Live birth (≥24 wk)	15 (83%)	11 (69%)	149 (79%)
Miscarriage (<24 wk)	1 (6%)	2 (13%)	21 (11%)
Therapeutic termination (<24 wk)	0 (0%)	2 (13%)	11 (6%)
Intrauterine fetal death (<24 wk)	0 (0%)	0 (0%)	3 (2%)
Still birth (≥24 wk)	1 (6%)	0 (0%)	3 (2%)
Ectopic pregnancy	1 (6%)	1 (6%)	1 (<1%)
Live births			
Type of labor (n <sup>a</sup> )	12	6	121
Spontaneous	4 (33%)	4 (67%)	14 (12%)
Induced	5 (42%)	2 (33%)	29 (24%)
Elective caesarean	3 (25%)	0 (0%)	78 (64%)
Mode of delivery (n <sup>a</sup> )	11	8	121
Normal cephalic	6 (55%)	3 (38%)	25 (21%)
Instrumental	0 (0%)	0 (0%)	9 (7%)
Caesarean	5 (45%)	5 (62%)	87 (72%) <sup>b</sup>
Gestational age (n <sup>a</sup> )	6	8	121
Mean ± SE	36.8 ± 1.5 wk	35.4 ± 1.4 wk	35.6 ± 0.3 wk
Range	30–40 wk	28–40 wk	25–41 wk
Pre-term delivery (<37 wk)	2 (33%)	4 (50%)	61 (50%)
Birth weight (n <sup>a</sup> )	10	7	112
Mean ± SE	2458 ± 186 g	2629 ± 350 g	2316 ± 80 g
Range	1400–3690 g	1260–3820 g	370–5500 g
Low birth weight (<2500g)	8 (80%)	4 (57%)	60 (54%)

<sup>a</sup> Number reported.

<sup>b</sup> Caesarean rate for England and Wales: 21.5% (8).

## Association between Pre-Pregnancy and Postpartum Serum Creatinine Levels (U.K.)



•2 groups of patients: prepregnancy SCr level of ≤150 µmol/L and >150 µmol/L.

•SCr level drops during the early part of the pregnancy and rises towards the baseline level during the third trimester (the trend expected for nontransplant pregnancies)

•However, for patients with prepregnancy SCr >150 µmol/L, the postpartum SCr level tended to be higher than their baseline level compared with patients with prepregnancy SCr ≤150 µmol/L.

Pregnancy may have a harmful effect on renal function when substantial renal dysfunction existed before the pregnancy.

## Allograft and Obstetric Outcomes in Pregnant Kidney Recipients (small single-center studies)

Literature Review of case-controlled retrospective studies [6, 7]

Country of Study	Spain	Iran
Number of transplanted women	35	74
Number of occurred gestations	43	95
Mean time from the transplant to pregnancy	4 years	3 years
% Spontaneous abortions	21%	24.2%
% Functional renal transplants 4 years after successful pregnancy	87.5%	90.5%
% Fetal birth weight < 2500 g	33.3%	62.5%
% Preeclampsia	37.5 %	47.4%

Pregnancy does not appear to have adverse effects on short-term graft survival in women after renal transplantation [5, 6, 7, 8, 9], however the the rates of obstetric and perinatal complications are increased.

## CONCLUSION

Based on our experience, combined spinal-epidural anesthesia was a successful choice for cesarean section and post-operative pain management in a parturient after kidney transplant secondary to lupus nephritis.

## Immunosuppressive Therapy in Renal Transplant Recipients

Side Effects that have a direct impact on Anesthetic and Perioperative Management

	Tacrolimus (FK 506)	Cyclosporin A	Steroids	Azathioprine
Renal Insufficiency	++	+	-	-
Hypertension	+	++	+	-
Diabetes	++	+	++	-
Neurotoxicity	+	+	+	-
Anemia	-	-	-	+
Leukopenia	-	-	-	+
Thrombocytopenia	-	-	-	+

## REFERENCES

- Sibanda, et al. Pregnancy after organ transplantation: a report from the UK Transplant pregnancy registry. *Transplantation*. 2007 May 27;83(10):1301-7.
- Kostopanagiotou G., et al. Anesthetic and perioperative management of adult transplant recipients in nontransplant surgery. *Anesth Analg* 1999; 89: 613–22