

## Potential child-bearing donors

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### GUIDELINES

No recommendations possible based on Level I or II evidence

### SUGGESTIONS FOR CLINICAL CARE

(Suggestions are based on Level III and IV evidence)

- There is no evidence of increased problems with fertility or pregnancy complications in female donors.
- Renal function and blood pressure should be monitored closely during pregnancy in previous kidney donors.
- Potential female donors of child-bearing age should have a beta-hCG performed prior to further investigations.
- The long-term renal function of female donors following pregnancy compared with other donor groups is not known.

### IMPLEMENTATION AND AUDIT

No recommendation.

### BACKGROUND

A frequent question of potential donors of child-bearing age is whether donation will affect the ability to have a normal pregnancy. Furthermore, there is a theoretical concern that increased renal blood flow and GFR during pregnancy could be deleterious to a solitary kidney.

The purpose of these guidelines is to review the available evidence relating to pregnancy outcomes following live kidney donation.

### SEARCH STRATEGY

**Databases searched:** MeSH terms and text words for kidney transplantation and living donor were combined with MeSH terms and text words for pregnancy. The search was carried out in Medline (1966 – September Week 2, 2006). The Cochrane Renal Group Trials Register was also searched for trials not indexed in Medline.

The National Transplantation Pregnancy Registry (NTPR) [ntpr@temple.edu] in the U.S. was contacted to provide any additional sources of abstracts.

**Date of search:** 26 September 2006.

**Update search:**

**Databases searched:** MeSH terms and text words for kidney transplantation were combined with MeSH terms and text words for living donor and combined with MeSH terms and text words for open and laparoscopic nephrectomy. The search was carried out in Medline (1966 – March Week 1, 2009). The Cochrane Renal Group Trials Register was also searched for trials not indexed in Medline.

**Date of searches:** 9 March 2009.

### WHAT IS THE EVIDENCE?

The largest study by Wrenshall *et al.*<sup>1</sup> is a retrospective questionnaire of female donors. Of 144 respondents (65%) the self-reported incidence of infertility and miscarriage was no different from those previously reported in a normal population. Pre-eclampsia was self-reported in 4.4% of donors (normal population incidence approximately 6–8%). There was no data on renal function and the true incidence of problems may have been underestimated because of the need for self-reporting.

A retrospective review of 39 pregnancies (32 live births)<sup>2</sup> in 23 women who had previously donated kidneys did not demonstrate any significant incidence of hypertension or proteinuria during the pregnancies.

Ibrahim *et al.*<sup>3</sup> reported on the outcome of 216 donors who had at least one pregnancy after donating a kidney. Of the 1537 female donors attending one centre, 939 responded to a survey regarding pregnancy. A total of 23% (n = 216) had at least one pregnancy after donation. The mean time from donation to pregnancy was 6.5 ± 4.6 years and the mean age at pregnancy was 31 ± 5 years. The percentage of live births in former kidney donors was similar to the general population (78% vs 75%), as was the rate of foetal loss. There was no control group for this study.

During pregnancy, right ureteral dilatation occurs more commonly than left and is thought to mainly be physiological. Ureteral obstruction during pregnancy that requires intervention is extremely uncommon but would obviously be of more serious consequence with a solitary kidney. A retrospective review of 92,836 pregnancies<sup>4</sup> found only 6 cases of symptomatic ureteral obstruction. A series of 6275 pregnancies found 5 cases of obstruction requiring

placement of stents;<sup>5</sup> stones were the cause of the obstruction in 4 of these cases. Overall, the reported incidence is between 0.007% and 0.07%.

## SUMMARY OF THE EVIDENCE

The available evidence comes from retrospective case reviews and donor surveys. The findings indicate that donors experience infertility and miscarriage rates similar to the normal population. The incidence of hypertension and proteinuria during pregnancy is also similar to that of the normal population. The reported incidence of ureteral obstruction during pregnancy requiring intervention is very low.

## WHAT DO THE OTHER GUIDELINES SAY?

**Kidney Disease Outcomes Quality Initiative:** No recommendation.

**UK Renal Association:** No recommendation.

**Canadian Society of Nephrology:** No recommendation.

**European Best Practice Guidelines:** No recommendation.

**International Guidelines:** No recommendation.

## United Kingdom Guidelines for Living Donor Kidney Transplantation:<sup>6</sup>

The presence of a solitary kidney does not appear to pose a significant risk during the course of a normal pregnancy. However, close follow-up is advisable in donors during pregnancy and periodic assessment of serum creatinine and creatinine clearance in addition to urine culture and blood pressure should be undertaken.

## Amsterdam forum on the care of the live kidney donor 2005:<sup>7</sup>

It was recommended to delay pregnancy until at least 2 months after nephrectomy to assess renal compensation prior to conception with evaluation including blood pressure,

GFR and assessment for microalbuminuria. The emphasis was to verify that postpartum renal function is normal.

## SUGGESTIONS FOR FUTURE RESEARCH

1. Prospective follow-up of pregnancy outcome and long term renal outcome via the national living donor registry.
2. A controlled prospective study following female donors that subsequently have a pregnancy compared with those who do not may provide the information required on outcome.

## CONFLICT OF INTEREST

Fiona Mackie has no relevant financial affiliations that would cause a conflict of interest according to the conflict of interest statement set down by CARI.

## REFERENCES

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4. Carey MP, Ihle BU, Woodward CS *et al.* Ureteric obstruction by the gravid uterus. *Aust N Z J Obstet Gynaecol* 1989; **29**: 308–13.
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7. Delmonico F. Council of the Transplantation Society. A Report of the Amsterdam Forum on the Care of the Live Kidney Donor: Data and Medical Guidelines. *Transplantation* 2005; **79** (6 Suppl): S53–S66.

## APPENDIX

**Table 1** Characteristics of included studies

Study ID	N	Setting	Study methods	Results	Main findings	Comments
Buszta <i>et al.</i> 1985 <sup>2</sup>	23	University Hospital, US	Retrospective review of prenatal and delivery records	39 pregnancies in 23 women. 1+ proteinuria 9%, trace proteinuria 30% – proteinuria disappeared in all patients postpartum	After donor nephrectomy, women can have a normal pregnancy without significant problems.	Follow up evaluation for 13/23 women
Wrenshall <i>et al.</i> 1996 <sup>1</sup>	220	Nephrology clinic, US	Retrospective questionnaire	45 pregnancies in 33 women. Miscarriage 13.3%, preeclampsia 4.4%, gestational hypertension 4.4%, proteinuria 4.4%, tubal pregnancy 2.2%	Results comparable with general population, donor nephrectomy is not detrimental to potential child-bearing donors.	Response rate of 144/220 (65%)