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Pregnancy on Haemodialysis: A UK National Prospective Cohort Study

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Introduction

- Recent reports suggest that pregnancy outcomes are improving in women requiring renal replacement due to intensive dialysis regimes[1]
- Contemporaneous prospective data are lacking in the UK for women requiring dialysis
- Few studies compare pregnancy outcomes in women requiring dialysis with those of renal transplant recipients.

Aim:

- To prospectively collect data on pregnancy outcomes in women requiring renal replacement in the UK and to compare outcomes with renal transplant recipients.

Methods

- Women who received dialysis for chronic kidney disease in pregnancies delivering between Jan 2011-Dec 2012 were identified through the UK Obstetric Surveillance System (UKOSS).
- Pregnancy outcomes were compared with those of women with renal transplants identified by UKOSS (Jan 2007- Mar 2010) (n=105). [2]

Results

- Thirteen pregnancies in women receiving dialysis were identified in the study period, including five women (38.5%) starting haemodialysis during pregnancy.
- No pregnancies in women receiving peritoneal dialysis were reported.
- Median number of hours dialysis received per week was 22.5 (IQR 18, 39).
- One woman had nocturnal haemodialysis but neonatal outcome data were not reported and excluded from outcome analysis .
- There were no differences in baseline demographics between women receiving haemodialysis or renal transplants, or between those who started dialysis before or during pregnancy. (Table 1)
- Women receiving haemodialysis were more likely to be taking aspirin and erythrocyte stimulating agents than those with renal transplants and had lower haemoglobin concentrations in all trimesters (Table 2).
- Only four women receiving haemodialysis (30.8%) were reported to receive intravenous iron during pregnancy.

Table 1: Maternal demographics

	Haemodialysis N=13	Renal Transplant N=105
Age at booking (years) Median (IQR)	34.5 (26.5, 37.5)	33.0 (28.5, 37.5)
BMI (kg/m²) Median (IQR)	25.7 (22.3, 31.9)	25.6 (22.3, 28.8)
Ethnicity		
White	9 (69.2%)	91 (86.7%)
Black	2 (15.4%)	3 (2.9%)
Asian	1 (7.7%)	10 (9.5%)
Other	1 (7.7%)	1 (1.0%)
Previous Transplant	3 (23.1%)	-
Nulliparous	4 (30.7%)	62 (60%)
Smoking	N=13	N=102
Never	9 (69.2%)	81 (79.4%)
Current smoker	0	8 (7.8%)
Stopped pre/during pregnancy	4 (30.8%)	13 (12.7%)
Aspirin Use	9 (69.2%)*	32 (30.4%)*
Erythrocyte stimulating Agent Use	9 (69.2%)**	3 (3%)**

*P=0.01; **P<0.0001

Adverse dialysis related events included:

- one line infection
- one episode of intradialysis hypotension
- one fistula thrombosis.

- There were no differences in live births between women receiving haemodialysis and renal transplants
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- There was one stillbirth at 25 weeks' gestation in a woman receiving 12 hours haemodialysis per week
- Women receiving haemodialysis were more likely to deliver infants at earlier gestations of lower birth weights requiring neonatal intensive care than women with renal transplants.(Table 3)

Table 2: Maternal Outcomes

	Haemodialysis N=13	Renal Transplant N=105
Pre-eclampsia	3 (23.1%)	23 (21.9%)
Mode of delivery		
Iatrogenic Delivery	8 (61.5%)	42 (44%)
Emergency Caesarean section	1 (7.7%)	18 (17.1%)
Elective Caesarean section	7 (53.8%)	43 (41.0%)
Lowest Hb (g/l) Median (IQR)		
First Trimester	95 (82, 100)*	109 (101, 120)*
Second Trimester	78 (72, 93)**	98 (90, 107)**
Third Trimester	89 (80, 94)$	98 (90, 105) $
Highest Urea (mmol/l) Median IQR		
First Trimester	16.3 (15.2, 22.6)	-
Second Trimester	12.5 (5.6, 27.1)	-
Third Trimester	14.3 (10.8, 16.6)	-
Admission to High Dependency Care	1 (7.7%)	21 (20.0%)

•*P=0.001; **P<0.0001; $P=0,015

Table 3: Neonatal Outcomes

	Haemodialysis N=12	Renal Transplant N=105
Live Birth	12 (92.3%)	96 (91.4%)
Miscarriage	0	9 (8.6%)
Stillborn	1 (7.7%)	0
Gestation at Delivery (Wks) Median (IQR)	32.0 (26.5, 37.1) $$	36.5 (34.0, 38.0) $$
< 37 weeks	10 (76.9%)	51 (48.6%)
<34 weeks	7 (53.8%)#	20 (19.0%)#
Birth weight (grams) Median (IQR)	1940 (1547, 2300)**	2522 (2188, 3062)**
Neonatal Intensive Care Admission	9 (75.0%)##	37 (35.2%)##

$$P=0.016; #P=0.01; ##P=0.03

- There were no correlations between number of dialysis hours, highest urea in each trimester and gestation at delivery or birthweight.
- Polyhydramnios was reported in four pregnancies (30.7%) in women receiving haemodialysis.

Conclusions

- Women receiving haemodialysis during pregnancy have worse neonatal outcomes than those with renal transplants.
- Number of dialysis hours per week appears to be increased during pregnancy, but the effects of further augmentation of dialysis dose needs to be explored.

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References

1. Hladunewich MA et al *J Am Soc Nephrol*. 2014;25:1103-1109
2. Bramham K et al *Clin J Am Soc Nephrol*. 2012;8:290-8

Acknowledgements

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