Establishing a joint maternal medicine and nephrology clinic for women with chronic kidney disease.

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Background

Women with chronic kidney disease (CKD) have an increased likelihood of maternal complications and more than twice the rate of adverse foetal outcomes in pregnancy[1]. Women with kidney transplants also have high rates of maternal and foetal complications: the rate of pre-eclampsia in this group was recorded at 24% in a 2013 UK cohort.[2]

Both groups benefit from appropriate pre-pregnancy counselling[3] and multidisciplinary antenatal care which includes input from maternal medicine and nephrology teams[4].

Data on pregnancy in kidney disease are soon to be recorded in the Renal Association 'National Registry of Rare Kidney Diseases' (RaDaR)[5], an initiative to pool data from patients with rare kidney diseases or complications.

Clinic Structure

The Richard Bright Renal Service is based at Southmead Hospital, Bristol. The Directorate provides a comprehensive established renal failure programme for over 7000 patients, of whom 597 require dialysis. Our transplant programme performs 100-150 transplants per year (including LKD, ABOi & HLAi). The Maternity Unit is a large tertiary level unit delivering 6500 women per year and a regional referral centre for extreme preterm deliveries < 28 weeks, with nationally recognised excellent maternal and neonatal outcomes.

We established a joint maternal medicine and nephrology clinic in October 2012 at North Bristol NHS Trust. Prior to the establishment of this service, pregnant patients with kidney disease were seen at separate maternal medicine and nephrology appointments at North Bristol or outreach clinics, without direct dialogue between these services.

The clinic is run once per month, and offers pre-pregnancy counselling, antenatal and post-natal care. Patients are seen jointly by one of two maternal medicine specialists (JH or SB) and a consultant nephrologist(AA), as well as having any necessary investigations including foetal imaging. Patients already known to the nephrology service are seen exclusively in the clinic during their pregnancy and need not attend general nephrology or transplant clinic appointments. This obviates the need for patients to attend multiple centralised specialist clinic appointments, reduces inconvenience and offers consultant-led continuity of care. The service also allows more comprehensive data-capture for our contribution to RaDaR.

Results

Up to March 2015, we have cared for 50 patients:

- 30 referred from Nephrology, 18 from primary care (community midwife or GP) and 2 from other specialties.
- 16 seen for pre-pregnancy counselling and are yet to conceive (4 with transplants, remainder with CKD1-4)
- 10 pregnant patients seen once and deemed low risk so not seen again
- 21 seen during pregnancy to delivery (16 with CKD1-4, none on dialysis, 5 with transplants)
- 5 patients currently pregnant (of whom 2 were seen during previous pregnancies; 4 with CKD, one with a transplant)

Of those followed up through pregnancy or currently pregnant under follow-up:

- There have been 25 pregnancies in 23 patients, including 1 twin pregnancy (current).
- Demographics and comorbidities are shown in **Table 1**.
- Aspirin was given through pregnancy or from time of referral in all but one (who declined, and did not develop pre-eclampsia).
- Maternal and neonatal outcomes are detailed in **Table 2**

Table 1: Characteristics of all patients seen during pregnancy

		Pregnancy group		
		CKD without transplant	Transplant	CKD-reviewed once and deemed low-risk
n		20 (4 currently pregnant)	6 (1 currently pregnant)	10
Mean age(range)		33(22-42)	27(22-38)	29(21-37)
Age >34(%)		7(35)	1(17)	3(30)
Pre-pregnancy counselling (%)		2(10)	3(50)	2(20)
Primary renal diagnosis	GN	5	1	0
	Reflux nephropathy	4	1	3
	PKD	1	2	0
	Diabetic nephropathy	3	0	3
	Lupus nephritis	2	0	0
	Unknown/Other	4	2	4
Pre-existing disease	Hypertension	6(30)	6(100)	0
	Diabetes	2(10)	0	0

Table 2: Outcomes among patients who have delivered

			Pregnancy group		
			CKD without transplant	Transplant	CKD-reviewed once and deemed low-risk
n			16	5	10
Mean age(range)			33(25-42)	28(23-38)	29(21-42)
Age >34 (%)			6(38)	1(20)	3(30)
Parity (%)		0	7(44)	2(40)	2(20)
		1	4(25)	3(60)	3(30)
		2+	5(31)	0	5(50)
Maternal features and complications	Median Pre-pregnancy creatinine ,umol/L (range)		93 (51-201)	120 (85-148)	Maternal data for this group were not collected
	>20% rise in creatinine (pre pregnancy to 3 months post pregnancy)		6(38%)	2(40%)	
	Pre-existing hypertension		6(38%)	5(100%)	
	Gestational hypertension*		5(31%)	4(80%)	
	Pre-existing diabetes		3(19%)	0	
	Gestational diabetes		1(6%)	0	
	Pre-existing proteinuria		4(25%)	1(20%)	
	New proteinuria Δ		2(13%)	2(40%)	
	Preeclampsia		1(6%)	1(20%)	
Delivery and neonatal complications	Mode of delivery (%)	Spontaneous vaginal delivery	6(38)	1(20)	
		Forceps	2(13)	0	
		Elective c-section	5(31)	1(20)	
		Emergency c-section	3(19)	3(60)	
	Median gestation at delivery (range)		38+4 (28+1 to 42+1)	36+3 (28+6 to 39+0)	39+3 (35+5 to 41+0)
	Pre-term (<37w)		4(25%)	0	1(10%)
	Very pre-term (<32w)		1(7%)	1(20)	0
	Congenital malformation		1(6%)	0	0
	Median birth weight, grams (range)		3175 (928-4415)	2720 (2554-2940)	3628 (2570-4100)
	Low birth weight, <2500g		3(19%)	1(20%)	0
	Mean birth centile		39th	28th	67th
	Small for gestational age α		4(25%)	1(20%)	0
	NICU		4(25%)	3(60%)	0
	Neonatal death		0	1(20%)	0

*** Defined as new blood pressure readings of >140/90 or need for new antihypertensive medications**
Δ Defined as new occurrence of uPCR>30mg/mmol
α Defined as centile at birth <10%

Transplant and immunosuppression

Time from transplantation to conception ranged from 18 months to 8 years.

- Two patients took tacrolimus and prednisolone, one took cyclosporine and prednisolone and one took tacrolimus, prednisolone and azathioprine before and during pregnancy.
- One patient was converted from mycophenolate (with prednisolone and tacrolimus) to azathioprine before conception. Our practice is to advise patients taking mycophenolate to switch to azathioprine with a 3-month 'wash-out' period before attempting to conceive. However, one patient, who was not seen before conception, conceived while taking mycophenolate and is currently pregnant.

Discussion

We have been successful in establishing a valuable service for patients with pregnancy in CKD, which has been well-received. Our service has the following benefits:

- Provides a coordinated, 'one-stop' service for maternal medicine and nephrology care: reduces inconvenience for patients
- Acts as an access-point to pre-pregnancy counselling and specialist maternal medicine care for patients already known to the nephrology service
- Allows comprehensive audit of obstetric and renal outcomes and contribution to RaDaR

The number of patients seen so far makes interpretation of outcomes difficult- we look forward to reporting these in more detail when the data are available. This type of clinic would be transferrable to other centres with large renal and maternal medicine departments.

References

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