



## Long-term maternal outcome after pregnancy in women with diabetic nephropathy

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Pregnancies complicated by diabetic nephropathy are associated with high rates of Caesarean section, pre-term delivery, infants small for their gestational age, congenital abnormalities and neonatal deaths.<sup>1,2</sup> Despite these adverse events, short-term fetal outcomes have improved in recent years. Because of this and because renal function in women with normal serum creatinine pre-pregnancy is probably not adversely affected by pregnancy, women with early diabetic nephropathy and normal serum creatinine are not now discouraged from becoming pregnant.<sup>1-4</sup> Although the fetal outcome is generally good, the long-term maternal outcome also needs consideration. One report describes one third of such patients having developed end-stage renal failure or died ten years after their last delivery.<sup>1</sup>

### Case series

We have recorded prospective data on all pregnant women with established diabetes who attended our Pregnancy Diabetes Clinic between 1985 and 2000 and who had diabetic nephropathy defined by the presence of both diabetic retinopathy and albuminuria (>300 mg/24 hours). Long-term maternal outcomes were obtained from a review of hospital notes. Data for individual pregnancies are presented as median (range). Of the 553 women attending the clinic, 14 women (with 24 singleton pregnancies) met the diagnostic criteria for diabetic nephropathy. The median age was 30 (19–47) years and parity 1 (0–7). There were 14 pregnancies in eight women with Type 1, and 10 in six women with Type 2 diabetes. The median duration of diabetes was 18.5 (3–28) years. The median serum creatinine pre-pregnancy was 0.07 (0.04–0.12) mmol/l and at delivery was 0.07 (0.05–0.13) mmol/l. The median birth weight of the infants was 2.95 (0.73–3.78) kg at 36 (27–40) weeks. Eleven infants (46%) were delivered at 35 weeks or before. Maternal hypertension (and associated complications) was the primary reason for premature delivery in eight women. Twenty infants were delivered by Caesarean section and 18 (75%) were admitted to the special care unit for 3 (1–60) days. Three had major congenital abnormalities. At a median follow up of 6 (1–16) years postpartum, five women (36%) had begun dialysis for end-stage renal failure. The median time to dialysis from the last pregnancy was 7 (3–12) years. Four of these women had proliferative retinopathy, one of whom is now blind. Moreover, four women treated for end-stage renal failure also suffered significant macrovascular morbidity including ischaemic heart disease (three women), stroke (three women), and peripheral vascular disease (two women). One of these women has now died.

### Discussion

While the short-term outcome from pregnancy complicated by nephropathy is now improved,<sup>3,4</sup> and it is reassuring to know that pregnancy does not accelerate the progression of diabetic renal disease in women without renal impairment pre-

pregnancy,<sup>1,5</sup> our data do emphasise that the long-term maternal outcome may be poor because of diabetic complications. This reflects the long duration of diabetes and often poor glycaemic control that these women have had. Whilst most diabetic women will attain excellent glycaemic control in pregnancy, it typically lapses afterwards to pre-pregnancy levels.<sup>6</sup> We suspect that the poor long-term maternal outcome is generally downplayed in the pre-pregnancy counselling of women with early diabetic nephropathy, which tends to concentrate on immediate pregnancy issues. At the least, an aggressive approach to the management of nephropathy after delivery is mandatory.

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