

## SHORT REPORT

## Does antenatal pelvic dilation predict renal scarring?

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Moderate antenatal renal pelvic dilation (5–15 mm) may suggest vesicoureteric reflux, but it is not known to predict renal scarring. Dimercaptosuccinic acid scans on such children aged over 4 years showed a scarring rate (0/133 boys, 1/56 girls) similar to our local population. Investigation and treatment of moderate dilation may not be required.

The antenatal anteroposterior renal pelvic diameter on ultrasound measurement is normally up to 5 mm.<sup>1</sup> Values above 15 mm suggest obstruction,<sup>2</sup> but moderate dilation of 5–15 mm may be associated with postnatal vesicoureteric reflux.<sup>3</sup> Because reflux and urinary tract infections may lead to preventable renal scarring, some centres perform micturating cystography in these newborns. However, the assumed relation between children in whom moderate antenatal pelvic dilation is identified and development of subsequent renal scarring has never been confirmed.

## METHODS

Because renal scarring virtually always begins before the 4th birthday,<sup>4</sup> we performed dimercaptosuccinic acid scans on children over 4 years old who were known to have had moderate antenatal dilation on at least one side. Cases were recruited from two local antenatal databases that were acquired before the link between moderate renal pelvic dilation and vesicoureteric reflux had been postulated, so there had been no clinical follow up. Fetuses with additional abnormalities were excluded, as were children who had ever taken long term prophylactic antibiotics. We asked their general practitioners for evidence of previous microbiologically proven urine infections. Children who had already had a dimercaptosuccinic acid scan after their 4th birthday were included, but not rescanned. We compared their urine

infection and kidney scarring rates with our published local values.<sup>5</sup>

Ethics approval was obtained from the Northern and Yorkshire Multicentre Research Ethics Committee.

## RESULTS AND DISCUSSION

Of 239 children identified from the databases, 10 had already had dimercaptosuccinic acid scans, and we performed 179 more on children with a mean age of 7.4 years (range 4.1–13.6). Unilateral renal pelvic dilation had been identified in 101 children and bilateral in 88. The 50 children who did not participate were similar to those who did, suggesting that their exclusion did not cause important bias (table 1).

The previously described male preponderance of moderate dilation was noted.<sup>1–3</sup> Only a single segment kidney scar was noted, in a girl who had already been scanned after proven urinary tract infections. The scarring rate was 0/133 (0%, 95% confidence interval (CI) 0 to 2.8) for boys and 1/56 (1.8%, 95% CI 0.3 to 9.4) for girls. The corresponding values for our control population were 0.17% for boys and 0.52% for girls. We assessed these data using a Bayesian approach with a prior distribution assumed for the population scarring rate: the mean given by the population rate and the variance controlled by a parameter, N. Values of N near 1 correspond to greater prior uncertainty than values near 100, for example. The probability of obtaining 0 scars in a sample of 133 boys or 0 or 1 scars in a sample of 56 girls can be computed from the predictive distribution for a wide range of values of N. If all these values are unsurprising, it is reasonable to believe no evidence has been found that children with moderate antenatal dilation have higher scarring rates than the general population. The probability of 0 boys scarring was between 0.88 and 0.95, and for 0 or 1 girls scarring was between 0.93 and 0.95, indicating that the scarring rates among children with moderate antenatal renal pelvic dilation were not significantly different from our local population.

**Table 1** Results of 239 children with moderate antenatal renal pelvic dilation

	Study scan	Prior scan	None
Children with antenatal pelvic dilation			
All	179	10	50*
Boys	127 (71)	6 (60)	40 (80)
Girls	52 (29)	4 (40)	10 (20)
Children with urinary tract infection			
All	12 (7)	5 (50)	3† (6)
Boys	7 (6)	3 (50)	3† (8)
Girls	5 (10)	2 (50)	0† (0)
Children with scars			
Boys	0	0	–
Girls	0	1	–
Mean anteroposterior renal pelvic diameter (mm)	8.1	9.1	8.0

Values are number (%). Scan is dimercaptosuccinic acid scan.

\*Of these 50, 30 families did not respond to contact by either their general practitioner or our group, 11 families did not attend for their child's booked dimercaptosuccinic acid scan despite giving consent, five families refused to participate, and four general practitioners did not allow us to contact the family.

†Details of previous urinary infections available in all but two boys and one girl.

Ten of the 133 study boys (7.5%, 95% CI 4.1 to 13.3) and seven of 56 girls (12.5%, 95% CI 6.2 to 23.6) had urine infections, compared with population rates of 3.1% and 8.0% respectively. The probability of 10 or fewer infections among 133 boys was 0.88 to 0.96 for a wide range of N, and for seven or fewer among 56 girls was 0.79 to 0.87, so these rates were not unusual compared with our population controls.

Our data indicate that moderate antenatal renal pelvic dilation of 5–15 mm is not a marker for an increased rate of urine infection or renal scarring, and suggests that it is inappropriate to perform cystograms on these babies as newborns.

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