

Smaller left kidney in low birth weight children

To the Editor: We read with interest the meta-analysis performed by Schreuder¹ demonstrating that renal malformations are more frequently found on the left side.

Recently, we demonstrated that children born with low birth weight (<2500 g) are prone to salt sensitivity while the extent inversely correlated with total renal mass.² While left and right kidney lengths were similar in children born at term with appropriate weight when expressed in % of the expected size for age and height³ (Figure 1a), in children born with low birth weight the left kidney was significantly smaller and shorter compared with the right kidney (volume: 81% ± 3 vs. 89% ± 3, $P = 0.0007$; length: 92% ± 1.3 vs. 96% ± 1.1, $P = 0.018$; Figure 1b and c).

Our findings support the assumption that not only congenital abnormalities of the kidney and urinary tract are more often lateralized to the left side, but also a compromised intrauterine fetal growth leading to low birth weight seems to impair renal development preferentially to the left side.

The mechanisms leading to this lateralization are unknown. One hypothesis could be that vascular outgrowth and angiogenesis of the longer left than right renal artery was more compromised by hypoxia or a sparse nutritional environment during the fetal developmental period. Fetal programming is thought to be mediated by epigenetic and morphologic changes,⁴ which should probably be reevaluated side-dependently. These findings might even have consequences for living donation or the decision to nephrectomy in the urological environment.

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Giacomo D. Simonetti¹ and Markus G. Mohaupt²

¹Division of Paediatric Nephrology, Children's Hospital, Inselspital, Bern University Hospital and University of Bern, Berne, Switzerland

and ²Division of Hypertension, University of Bern, Berne, Switzerland

Correspondence: Giacomo D. Simonetti, Division of Pediatric Nephrology, Children's Hospital, Inselspital, University of Bern, CH-3010 Berne, Switzerland. E-mail: giacomo.simonetti@insel.ch

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The Author Replies: I thank Dr Simonetti and Dr Mohaupt for presenting yet another example of difference between the left and right kidney;¹ a more subtle difference than the categories of congenital anomalies of the kidney and urinary tract that I described.² Indeed, their data show that being born with a low birth weight reduces the size of the left kidney, a side-dependent effect that has not been evaluated consistently but has been reported previously.³

It is unknown whether this difference in size is accompanied by a difference in nephron numbers or renal function between the sides. Most stereological, i.e., gold standard, studies into the number of nephrons in man have been performed using the right kidney predominantly.

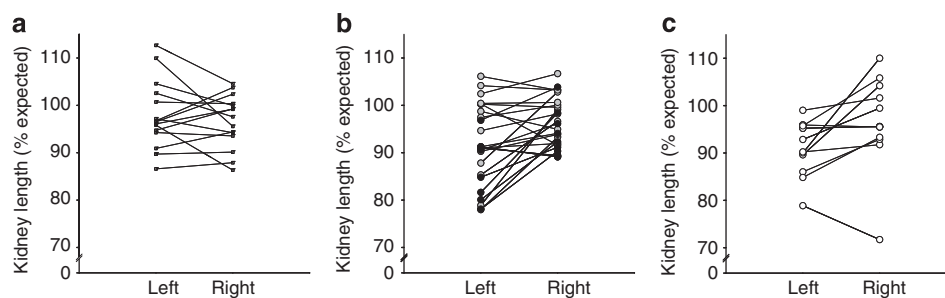


Figure 1 | Left and right kidney length, expressed in % of the expected size. (a) Children born at term with appropriate weight ($n = 15$). No significant difference was detected. **(b)** Low birth weight (LBW) children with known salt sensitivity. Black circles denote salt sensitive ($n = 9$) and gray circles indicate salt-resistant children ($n = 15$). Left kidneys were smaller than right ones ($P = 0.04$). **(c)** LBW children with unknown salt sensitivity ($n = 11$). Left kidneys were smaller than right ones ($P = 0.03$).