



Prenatal evaluation of kidney function in mice using dynamic contrast-enhanced magnetic resonance imaging

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Résumé en anglais	<p>Glomerular differentiation starts as soon as embryonic stage 12 in mice and suggests that kidneys may be functional at this stage. Dynamic contrast-enhanced magnetic resonance microscopy, a noninvasive imaging technique, was used to assess renal function establishment in utero. Indeed, in adults ($n = 3$), an intravenous injection of gadolinium-DOTA induced in a first step a massive and rapid drop in kidney signal intensity followed, in a second step, by a drop in bladder signal intensity. The delay in signal changes between kidney and bladder reflected glomerular filtration. Pregnant mice underwent anatomical and dynamic contrast-enhanced magnetic resonance microscopy on postcoital days 12-13 ($n = 2$), 13-14 ($n = 1$), 14-15 ($n = 3$), 15-16 ($n = 2$), 16-17 ($n = 3$), 17-18 ($n = 3$), and 18-19 ($n = 1$). Kidneys and bladder were unambiguously depicted prior to contrast agent injection on stage 15-16 embryos. Contrast agent injection allowed kidney, detection as early as stage 12-13 but not bladder. Kinetics of signal changes demonstrated that glomerular filtration is established at embryonic stage 15-16 in mice. Thus, anatomical and dynamic contrast-enhanced magnetic resonance microscopy may be a powerful noninvasive method for in vivo prenatal developmental and functional studies.</p>
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Liens

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