Ultrasound and 3D imaging characterisation of a rat model of polycystic kidney disease

Methods

10-week-old male PCK rats (PCK17/CrljCrl) and control Sprague-Dawley rats served as controls. Body weight was measured biweekly. Plasma urea/creatinine, urine albumin/creatinine and right kidney size-volume (ultrasound imaging) was assessed. Upon termination at 17 and 25 weeks of age, kidney and liver weight was obtained, and right whole-kidney cyst morphometrics was performed using quantitative light sheet 3D imaging.

Background & Aim

Polycystic kidney disease (PKD) is a congenital fibrolytic disorder where cysts are forming within the kidney causing kidney enlargement and declining kidney function which can eventually lead to chronic kidney disease (CKD). Translational animal models can inform about potential clinical efficacy of novel drug candidates for PKD. The PCK rat is an established genetic model of PKD with natural history and renal histologic abnormalities that resemble the human disease. The present study aimed to characterize disease progression in the PCK rat model.

Results

The PCK rat model is a translational preclinical model suitable for testing novel drug therapies for PKD.

Conclusion

- The PCK rat shows progressive kidney injury and enlarged kidneys
- The PCK rat shows marked and progressive renal cyst formation
- Combined ultrasound and light sheet imaging is advantageous for quantitative analysis of whole-kidney pathology in the PCK rat.

References

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