

Environmental risk factors for congenital solitary functioning kidney

Sander Groen in 't Woud^{1,2}, Nel Roeleveld¹, Wout Feitz³, Michiel Schreuder², Loes van der Zanden¹

¹Department for Health Evidence, Radboud Institute for Health Sciences, Nijmegen, the Netherlands
Departments of ²Pediatric Nephrology and ³Urology, Amalia Children's Hospital, Nijmegen, the Netherlands

Background

- Yearly, 80 children are born with a congenital solitary functioning kidney (CSFK) in the Netherlands
- The aetiology is multifactorial, with genetic and environmental factors involved
- Patients with CSFK have a higher risk of kidney injury
- Yearly screening for kidney injury is recommended

Research question

Which environmental risk factors are involved in the aetiology of CSFK?

Patients and Methods

Available in AGORA data- and biobank

Recruited nationwide

156 patients
4039 controls

632 patients



Patients:

- Born 1993-2021
- Primary or secondary CSFK

Controls:

- Born 1990-2021
- No major birth defects

Risk factors:

- Maternal demographics, health and lifestyle
- Collected using online or paper questionnaires

Data Analysis

- Crude odds ratios adjusted for year of birth
- Adjusted odds ratios (aOR) estimated via multivariable logistic regression
- Adjusted for minimally sufficient confounders sets determined via directed acyclic graphs (DAGs)
- Ten imputed datasets
- Stratified per CSFK subtype

Results (primary CSFK, n=434)

	aOR with 95% confidence interval
Elevated odds ratios:	
Family history	8.4 (4.3-16.2)
Stress during pregnancy	2.1 (1.3-3.3)
Conception with IVF/ICSI	2.0 (1.2-3.3)
Smoking in aetiologically relevant period	1.4 (1.0-1.9)
No effect:	
Use of folic-acid supplements	0.8 (0.6-1.1)
Decreased odds ratios:	
Use of multivitamins	0.7 (0.5-1.0)
Alcohol consumption	0.8 (0.6-1.0)

Conclusions

- Associations with family history, IVF/ICSI and smoking were confirmed
- Maternal stress was identified as new potential risk factor for CSFK
- Folic-acid containing multivitamins may be more effective in preventing CSFK than folic-acid supplements

Contact Information

Sander Groen in 't Woud, MD
PhD candidate
Radboud Institute for Health Sciences
E: sander.groenintwoud@radboudumc.nl
T: +316 13 89 35 32

