CJASN Clinical Journal of the American Society of Nephrology

Cardiovascular Phenotypes in Children with CKD: The 4C Study

Franz Schaefer, Anke Doyon, Karolis Azukaitis, Aysun Bayazit, Nur Canpolat, Ali Duzova, Ana Niemirska, Betul Sözeri, Daniela Thurn, Ali Anarat, Bruno Ranchin, Mieczyslav Litwin, Salim Caliskan, Cengiz Candan, Esra Baskin, Ebru Yilmaz, Sevgi Mir, Marietta Kirchner, Anja Sander, Dieter Haffner, Anette Melk, Elke Wühl, Rukshana Shroff, Uwe Querfeld for the 4C Study Consortium

[+] Author Affiliations

Correspondence:
Dr. Franz Schaefer, Pediatric Nephrology Division, Center for Pediatrics and Adolescent Medicine, Im Neuenheimer Feld 430, 69120 Heidelberg, Germany.
Email: franz.schaefer@med.uni-heidelberg.de

F.S. and A. Doyon contributed equally to this work.

« Previous | Next Article »
Table of Contents

This Article

Published online before print November 2016, doi: 10.2215/CJN.01090216
CJASN **January 06, 2017** vol. 12 no. 1 **19–28**

» Abstract *Free*
Figures Only *Free*
Full Text *Free*
Full Text (PDF) *Free*
Supplemental Data

Abstract

Background and objectives Cardiovascular disease is the most important comorbidity affecting long-term survival in children with CKD.

Design, setting, participants, & measurements The Cardiovascular Comorbidity in Children with CKD Study is a multicenter, prospective, observational study in children ages 6–17 years old with initial GFR of 10–60 ml/min per 1.73 m^2. The cardiovascular status is monitored annually, and subclinical cardiovascular disease is assessed by noninvasive measurements of surrogate markers, including the left ventricular mass index, carotid intima–media thickness, and central pulse wave velocity. We here report baseline data at study entry and an explorative analysis of variables associated with surrogate markers.

Results A total of 737 patients were screened from October of 2009 to August of 2011 in 55 centers in 12 European countries, and baseline data were analyzed in 688 patients. Sixty-four percent had congenital anomalies of the kidney and urinary tract; 26.1% of children had uncontrolled hypertension (24-hour ambulatory BP monitoring; $n=545$), and the prevalence increased from 24.4% in CKD stage 3 to 47.4% in CKD stage 5. The prevalence of left ventricular hypertrophy was higher with each CKD stage, from 10.6% in CKD stage 3a to 48% in CKD stage 5. Carotid intima–media thickness was elevated in 41.6%, with only 10.8% of patients displaying measurements below the 50th percentile. Pulse wave velocity was increased in 20.1%. The office systolic BP SD score was the single independent factor significantly associated with all surrogate markers of cardiovascular disease. The intermediate end point score (derived from the number of surrogate marker measurements >95th percentile) was independently associated with a diagnosis of congenital anomalies of the kidney and urinary tract, time since diagnosis of CKD, body mass index, office systolic BP, serum phosphorus, and the hemoglobin level.

Conclusions The baseline data of this large pediatric cohort show that surrogate markers for cardiovascular disease are closely associated with systolic hypertension and stage of CKD.

left ventricular hypertrophy | arteriosclerosis | pulse wave velocity | Biomarkers | blood pressure | Blood Pressure Monitoring, Ambulatory | Body Mass Index | Carotid Intima-Media Thickness | Child | Comorbidity | Europe | glomerular filtration rate | Hemoglobins | Humans | hypertension | Hypertrophy, Left Ventricular | Phenotype | Phosphorus | Phosphorus, Dietary | Prevalence | Prospective Studies

Current Issue
March 07, 2018, 13 (3)

Alert me to new issues of CJASN

ONLINE SUBMISSION
AUTHOR RESOURCES
ABOUT CJASN
EDITORIAL BOARD
REPRINTS/PERMISSIONS
IMPACT FACTOR
MOST READ
MOST CITED

CJASN ePress
Updated on:
March 9, 2018
By Date / By Subject

RSS

Received February 1, 2016.
Accepted September 26, 2016.

Articles citing this article

Print ISSN: 1555-9041
Online ISSN: 1555-905X