Project title:
Vitamin K1 to slow vascular calcification in hemodialysis patients (Vita-VasK)

Length of the project:
From July 5, 2013 to July 2020 (recruitment finished in Jan 2019)

Principal Investigator:
Jürgen Floege

Proposed research:
VitaVasK is a prospective, randomized, parallel group, multicentre trial (EudraCT No.: 2010-021264-14) that will include HD patients in an open-label, two-arm design. After baseline multi-slice computed tomography (MSCT) of the heart and thoracic aorta, patients with a coronary calcification volume score of at least 100 will be randomized to continue on standard care or to receive additional supplementation with 5 mg vitamin K1 orally thrice weekly. Treatment duration will be 18 months, and MSCT scans will be repeated after 12 and 18 months. Primary end points are the progression of thoracic aortic and coronary artery calcification (calculated as absolute changes in the volume cores at the 18-month MSCT versus the baseline MSCT). Secondary end points comprise changes in Agatston score, mitral and aortic valve calcification as well as major adverse cardiovascular events (MACE) and all-cause mortality. VitaVask also aims to record MACE and all-cause mortality in the follow-up period at 3 and 5 years after treatment initiation. This trial may lead to the identification of an inexpensive and safe treatment or prophylaxis of VC in HD patients.

Aim of the research:
The overall aim of the VitaVasK study is to explore and subsequently confirm whether a vitamin K1-based therapy attenuates the progression/can prevent or revert vascular calcification of thoracic aortic and coronary artery calcification compared to standard treatment. Globally, approximately 500 million patients suffer from chronic kidney disease and 2.2 million require dialysis treatment. Compared to the general population, patients with advanced chronic kidney disease experience a 10 – 100x increased risk of cardiovascular complications, which translates into a mortality risk comparable to the one found in patients with metastatic cancer disease. This problematic situation is further complicated by the fact that many treatment strategies (including statins, increased dialysis dose and erythropoietin), in randomized controlled trials have not been shown to improve survival in this patient group. A major problem in dialysis patients is accelerated vascular calcification; a process that increases the risk of cardiovascular complications and premature death. Strategies that interfere with the progress of vascular calcification are urgently needed. Vitamin K1 supplementation may be a novel effective and well tolerated treatment strategy to slow down the calcification process and lower the risk of cardiovascular complications.
Given a successful outcome of the clinical trial, Vitamin K1 will be the first substance proving an attenuation of vascular calcification in a larger cohort of dialysis patients. The trial is powered to detect a difference in vascular calcification between the treatment and control group; nevertheless, mortality is as well listed as a secondary end point. As vascular calcification is an independent risk factor for cardiovascular mortality and morbidity, this trial may give direct or indirect reason for a treatment option for a major risk factor of dialysis patients.

List of the papers published in peer review journals:
Krueger T, Schlieper G, Schurgers L, Cornelis T, Cozzolino M, Jacobi J, Jadoul M, Ketteler M, Rump LC, Stenvinkel P, Westenfeld R, Wiecek A, Reinartz S, Hilgers RD, Floege J.
Vitamin K1 to slow vascular calcification in haemodialysis patients (VitaVasK trial): a rationale and study protocol.
Nephrol Dial Transplant. 2014 Sep;29(9):1633-8.

List of the presentations done at major congresses/meetings:
none