Vitamin K_1 intake and incident diabetes in the Danish Diet Cancer and Health study

P. Pokharel^1,2, J.W. Bellinge^3,4, F. Dalgaard^5,6, K. Murray^7, M. Sim^1,3, B. Yeap^3,8, E. Connolly^1, L. Blekkenhorst^1, C. Bondonno^1,3, J. Lewis^7, G. Gislason^6,10,11,12, A. Tjønneland^2,13, K. Overvad^14, J. Hodgson^1,3, C. Schultz^3,4 and N. Bondonno^1,2

^1Nutrition & Health Innovation Research Institute, School of Medical and Health Sciences, Edith Cowan University, Perth, WA, Australia,
^2Danish Cancer Society Research Center, Copenhagen, Denmark,
^3School of Medicine, University of Western Australia, Perth, WA, Australia,
^4Department of Cardiology, Royal Perth Hospital, Perth, WA, Australia,
^5Department of Medicine, Nykøbing Falster Sygehus, Nykøbing, Denmark,
^6Department of Cardiology, Herlev & Gentofte University Hospital, Copenhagen, Denmark,
^7School of Population and Global Health, University of Western Australia, Perth, WA, Australia,
^8Department of Endocrinology and Diabetes, Fiona Stanley Hospital, Perth, WA, Australia,
^9Centre for Kidney Research, Children’s Hospital at Westmead, Sydney Medical School, The University of Sydney, Sydney, NSW, Australia,
^10The National Institute of Public Health, University of Southern Denmark, Odense, Denmark,
^11The Danish Heart Foundation, Copenhagen, Denmark,
^12Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark,
^13Department of Public Health, University of Copenhagen, Copenhagen, Denmark and
^14Department of Public Health, Aarhus University, Aarhus, Denmark

Observational studies have observed lower risks of type 2 diabetes (T2D) with higher vitamin K_1 intakes, but these studies have lacked power to investigate effect modification due to known risk factors for diabetes. Thus, we aimed to examine associations between vitamin K_1 intake and incident diabetes overall and in subpopulations at risk of diabetes. In this prospective cohort study, participants from the Danish Diet, Cancer, and Health study who had no history of diabetes and had completed a food-frequency questionnaire (FFQ) at baseline were followed up for diabetes. The association between intakes of vitamin K_1 (phylloquinone), estimated from the FFQ, and incident diabetes was determined using multivariable-adjusted Cox proportional hazards models.

In 54,787 Danish residents with a median [IQR] age of 56 [52–60] years at baseline, 6700 individuals were diagnosed with diabetes during 20.8 [17.3–21.6] years of follow-up. Intake of vitamin K_1 was linearly inversely associated with incident diabetes (p < 0.0001). Compared to participants with the lowest vitamin K_1 intakes (Quintile 1; median intake 57 μg/day), participants with the highest intakes (Quintile 5; median intake: 191 μg/day) had a 31% lower risk of diabetes (HR = 0.69, 95% CI [0.64, 0.74]) after multivariable adjustments. The inverse association between vitamin K_1 intake and incident diabetes was present in all subgroups; males and females, ever and never smokers, low and high physical activity groups, and in participants who were normal to overweight and obese at baseline. Our findings suggest a beneficial role of vitamin K_1 among adults; promoting adequate intake of foods rich in vitamin K_1 (e.g., green leafy, cruciferous vegetables and plant oils) may help in preventing diabetes.

References