

Salt intake and the risk of heart failure

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Background: High salt (sodium chloride) intake is one of the major causes of high blood pressure and an independent risk factor for CHD and stroke. The role of salt intake in the development of heart failure (HF) is not known. Estimation of individual salt intake is methodologically demanding and therefore, suitable population-based cohorts are rare. The 24-hour sodium excretion is considered as the gold standard for salt intake estimation at individual level.

Purpose: To assess the relationship of salt intake to the development of HF.

Methods: A prospective follow-up study of 4630 randomly selected men and women aged 25–64 at the baseline who participated in the North Karelia Salt Study and the National FINRISK Study between 1979 and 2002 in Finland. Baseline data collection included a self-administered questionnaire on health behavior, measurements of weight, height and blood pressure, venous blood sample for laboratory analysis, and collection of 24 hour urine sample. At the study site, study nurses measured urine volume and took 100ml sample for laboratory analysis. One gram salt intake was calculated as equal of 17.1 mmol sodium excretion. The study cohort was followed up 12 years through computerized register linkage to the National Health Records. Cases of incident HF were identified from the Causes-of-Death Register or from the Hospital Discharge Register with the ICD-10 codes I50, I110, I132 or corresponding ICD-9 codes, or from the drug reimbursement records. The association of salt intake in quintiles (<6.76g, 6.77–8.80g, 8.81–10.95g, 10.96–13.73g and >13.73g/day) and the risk of an incident new HF event was estimated by Cox proportional hazard models.

Results: During the follow-up 121 men and women developed new HF. In an age, sex, study year and area adjusted model, Hazard ratios in 2nd, 3rd, 4th and 5th salt intake quintiles, compared to the 1st one were: 0.83, 1.40, 1.70 and 2.10 (p for the trend 0.002). After further adjustment for systolic blood pressure, serum total cholesterol level and body mass index the Hazard ratios were: 1.13, 1.45, 1.56 and 1.75 (p for the trend 0.009), respectively.

Conclusions: High salt intake increases the risk of HF markedly. For more detailed risk estimation, larger pooled population cohorts are needed.