| **Study** | **Participants** | **Exposure** | **IntakeStatus Ascertainment** | **Results** |
| --- | --- | --- | --- | --- |
| Joosten, 2014152Location: NetherlandsSetting: CommunityDesign: Prospective Cohort studyStudy Name:The Prevention of Renal and Vascular End-stage Disease (PREVEND) study. | Study of: AdultsN: 2363% Male: by sodium quartiles q1 48.7 q2 48.7 q3 48.7 q4 48.7Mean Age/Range/Age at Baseline: by sodium quartiles q1 mean 50 (SD 13) q2 mean 49 (SD 13) q3 mean 48 (SD 12) q4 mean 47 (SD 11)Race: NRSystolic BP: by sodium quartiles q1 mean 129 (SD 22) q2 mean 128 (SD 20) q3 mean 128 (SD 20) q4 mean 129 (SD 20)Diastolic BP: by sodium quartiles q1 mean 74 (SD 10) q2 mean 74 (SD 10) q3 mean 74 (SD 10) q4 mean 74 (SD 9)Magnesium: NRCalcium: NROther Minerals: NRMean BMI: by sodium quartiles q1 mean 25 (SD 3.7) q2 mean 25.5 (SD 3.7) q3 mean 26.1 (SD 4.1) q4 mean 27.5 (SD 4.8)% with Hypertension: by sodium quartiles q1 32.8 q2 30.4 q3 31.4 q4 30.7% with history of CVD: NR% with Type 2 diabetes: by sodium quartiles q1 2.2 q2 2.5 q3 2.9 q4 4.7% with Kidney disease: NR% with history of Kidney stones: NRInclusion: Included Dutch participants between ages 28 to 75 and those who agreed to participate in questionnaire survey and urine sample collection.Exclusion: Excluded pregnant women and those with type I diabetes. | Exposure Type: Sex-specific quartiles of sodium excretionExposure Unit: mmol/24hDuration: NRExposure to Follow Up Time: a median of 10.5 yearsDose format: rangeQ1, Dose: male <95 female <122Q2, Dose: male 95-121 female 122-154Q3, Dose: male 122-151 female 155-190Q4, Dose: male >151 female >190continuous, Dose: per 1-g/d increase | Sodium measure: two 24-hr urine analysis with out reported quality control measureBest sodium measure recorded: During baseline examination, participants collected two 24-hour urines for 2 consecutive days.Mortality Outcomes-Method of Ascertainment: Central Bureau of StatisticsCVD, CHD, stroke, kidney stones/disease Outcomes-Method of ascertainment: national registry of hospital discharge diagnoses | Coronary Heart Disease Events (CHD was defined as myocardial infarction (ICD-code 410), acute and subacute ischemic heart disease (ICD-code 411) and coronary artery bypass grafting or percutaneous transluminal coronary angioplasty.) (mmol/24h/Outcome):Median 10.5 years (Q1-Q3: 9.9-10.8 years; 71491 person years) FUQ1 cases: 76, total: NR, person-years: 5524, continuous cases: 290, total: NR, person-years: 21669, Q2 cases: 70, total: NR, person-years: 5336, Q3 cases: 74, total: NR, person-years: 5472, Q4 cases: 70, total: NR, person-years: 5337Adjustment: Age, body mass index, smoking status, sex, alcohol intake, parental history of coronary heart disease, type 2 diabetes, total to high-density lipoprotein cholesterol ratio, and urinary potassium, magnesium, and creatinine excretionFor each 1-g/d increase, the associations between sodium excretion and risk of CHD were significant only among subjects with hypertension.No statistically significant association was observed. |
| O'Donnell, 2014124Location: 17 low-, middle-, and high-income countriesSetting: CommunityDesign: Prospective Cohort studyStudy Name:The Prospective Urban and Rural Epidemiology (PURE) study. | Study of: AdultsN: 101945% Male: 42.5Mean Age/Range/Age at Baseline: mean 51.01 (SD 9.72) yearsRace: 48.4 AsianSystolic BP: mean 131.7 (SD 22.30)Diastolic BP: mean 82.24 (SD 15.65)Magnesium: NRCalcium: NROther Minerals: NRMean BMI: NR% with Hypertension: 41.5% with history of CVD: 8.3% with Type 2 diabetes: 9.1% with Kidney disease: NR% with history of Kidney stones: NRInclusion: Study selected a number of countries representing different economic levels, and selected urban and rural communities based on predetermined guidelines. Households and individuals were selected to fulfill maximum representativeness. Selected individuals aged between 35-70.Exclusion: Excluded those who refused to participate. | Exposure Type: Estimated Potassium Excretion (Kawasaki equation)Exposure Unit: g/dayExposure Type: Estimated Sodium Excretion (Kawasaki equation)Exposure Unit: g/dayDuration: NRExposure to Follow Up Time: mean 3.7 yearsDose format: rangeG1, Dose: <3G2, Dose: 3-5.99G3, Dose: >=6Q1, Dose: <1.50Q2, Dose: 1.50-1.99Q3, Dose: 2.00-2.49Q4, Dose: 2.50-3.00Q5, Dose: >3.00 | Sodium measure: Partial or spot urine with validated prediction equationBest sodium measure recorded: collected one morning fasting midstream urine sample (Kawasaki formula)Sodium, Method of Validation: A validation study using the Kawasaki formula with actual 24-hour urine collection in 1,083 people from 11 countries showed an intraclass correlation coefficient of 0.71 (95% confidence interval (CI), 0.65 to 0.76).Potassium measure: Partial or spot urine with validated prediction equation\_1Best potassium measure recorded: collected one morning fasting midstream urine sample (Kawasaki formula)Potassium, Method of Validation: A validation study using the Kawasaki formula with actual 24-hour urine collection in 1,083 people from 11 countries showed an intraclass correlation coefficient of 0.71 (95% confidence interval (CI), 0.65 to 0.76).Mortality Outcomes-Method of Ascertainment: Standardized case-report forms (adjudicated by trained physicians using standardized definitions, Contact family members, Captured best available information from reliable sourcesCVD, CHD, stroke, kidney stones/disease Outcomes-Method of ascertainment: Interview with participant or proxy, Standardized case-report forms (adjudicated by trained physicians using standardized definitions), Captured best available information from reliable sources | All-cause mortality and Major Cardiovascular Event (g/day/Outcome):Mean 3.7 y FUG1 cases: NR, total: 10810, G2 cases: NR, total: 67794, G3 cases: NR, total: 23341Adjustment: All analyses adjusted for age, sex, education, ethnicity (Asian versus non-Asian), alcohol intake, diabetes mellitus, body mass index, a history of cardiovascular events and current smoking, using logistic regression with generalized estimating equation models.The association between estimated sodium excretion and the composite outcome was strongest among participants with hypertension, with an increased risk at an estimated sodium excretion of 6.00 g or more per day.All-cause mortality and Major Cardiovascular Event (g/day/Outcome):Mean 3.7 y FUQ1 cases: NR, total: 14262, Q2 cases: NR, total: 31466, Q3 cases: NR, total: 30956, Q4 cases: NR, total: 17171, Q5 cases: NR, total: 8032Adjustment: All analyses adjusted for age, sex, education, ethnicity (Asian versus non-Asian), alcohol intake, diabetes mellitus, body mass index, a history of cardiovascular events and current smoking, using logistic regression with generalized estimating equation models.No significant association between potassium intake and risk of death and major CVD events among those with hypertension. |
| Ohta, 2013153Location: JapanSetting: CommunityDesign: Prospective Cohort study. | Study of: AdultsN: 133% Male: 39.85Mean Age/Range/Age at Baseline: mean (SD) 59.7 (8.6)Race: NRSystolic BP: mean (SD) 143 (12)Diastolic BP: mean (SD) 85 (8)Magnesium: NRCalcium: NROther Minerals: NRMean BMI: NR% with Hypertension: NR% with history of CVD: NR% with Type 2 diabetes: NR% with Kidney disease: NR% with history of Kidney stones: NRInclusion: People with hypertension who visited the National Kyushu Medical Center, and underwent more than five successful 24 h home urine collections during the follow-up period were included.Exclusion: NR | Exposure Type: Urinary sodium excretionExposure Unit: g/dayDuration: NRExposure to Follow Up Time: 126 (10.5 y)Change in eGFR (Calculated using the Modification of Diet in Renal Disease formula)Dose format: NRcontinuous, Dose: per 1 g/dayEGFR (Calculated using the Modification of Diet in Renal Disease formula)Dose format: rangehigh urinary salt excretion, Dose: >8g/daylow urinary salt excretion, Dose: <8g/day | Sodium measure: More than one 24-hour urinary analysis without reported quality control measureBest sodium measure recorded: more than five, first between 1998 and 2000, last between 2008 and 2010CVD, CHD, stroke, kidney stones/disease Outcomes-Method of ascertainment: CKD was considered to be present if the patient had either a decreased estimated GFR (eGFR) (o60 ml min 1 per 1.73m2) or persistent proteinuria | Change in eGFR (Calculated using the Modification of Diet in Renal Disease formula) (g/day/Outcome):Average 10.5 years FUcontinuous cases: NR, total: 133Adjustment: Change in serum uric acid, body weight at the first visit, eGFR at the first visitSignificant negative association between average sodium excretion and change in eGFREGFR (Calculated using the Modification of Diet in Renal Disease formula) (g/day/Outcome):Average 10.5 years FUhigh urinary salt excretion cases: NR, total: 85, low urinary salt excretion cases: NR, total: 48Adjustment: NRSignificant association between those with an average salt excretion <8g/day and slower decline in renal function. |
| Seth, 2014154; Anderson, 2003155Location: USSetting: CommunityDesign: Prospective Cohort studyStudy Name:The Women’s Health Initiative Observational Study (WHI-OS). | Study of: AdultsN: 90137% Male: 0Mean Age/Range/Age at Baseline: mean 63.6 (SD 7.4) yearsRace: NRSystolic BP: NRDiastolic BP: NRMagnesium: NRCalcium: NROther Minerals: NRMean BMI: NR% with Hypertension: NR% with history of CVD: NR% with Type 2 diabetes: NR% with Kidney disease: NR% with history of Kidney stones: NRInclusion: Included 93676 postmenopausal women aged 50 to 79 years.Exclusion: Excluded women with history of stroke, with missing information on history of stroke, and those with no information on dietary potassium at baseline. Excluded women with <465 calories intake or with >3931 calories intake, whose potassium intake ranged 0.07--1790 mg or ranged 1507 -- 31129 mg. | Exposure Type: Dietary Potassium IntakeExposure Unit: mg/dDuration: NRExposure to Follow Up Time: average 11 yearsDose format: rangeQ1, Dose: <1925.5Q2, Dose: >=1925.5-2519.4Q3, Dose: >=2519.4-3193.6Q4, Dose: >=3193.6 | Potassium measure: Food Frequency QuestionnairesBest potassium measure recorded: Two food frequency questionnaires (FFQ) at study enrollment and year 3 follow-upPotassium, Method of Validation: Used a sub sample to evaluate FFQ measurement propertiesMortality Outcomes-Method of Ascertainment: Hospital records, Death certificate, Autopsy reportsCVD, CHD, stroke, kidney stones/disease Outcomes-Method of ascertainment: Hospital records, Medical files, self reported | All-cause mortality (Stroke was defined as rapid onset of neurological deficit lasting >24 hours and without evidence of other causes.) (mg/d/Outcome):Average 11 years FUQ1 cases: NR, total: NR, Q2 cases: NR, total: NR, Q3 cases: NR, total: NR, Q4 cases: NR, total: NRAdjustment: Age, race, hypertension status, smoking status, physical activity, history of diabetes mellitus, history of atrial fibrillation, history of myocardial infarction, hormone use, alcohol intake, aspirin use, high cholesterol and body mass indexAmong women with hypertension, higher potassium intake was associated with lower all-cause mortality, but there was no association with any stroke outcome.Stroke (All) (Stroke was defined as rapid onset of neurological deficit lasting >24 hours and without evidence of other causes.) (mg/d/Outcome):Average 11 years FUQ1 cases: NR, total: NR, Q2 cases: NR, total: NR, Q3 cases: NR, total: NR, Q4 cases: NR, total: NRAdjustment: Age, race, hypertension status, smoking status, physical activity, history of diabetes mellitus, history of atrial fibrillation, history of myocardial infarction, hormone use, alcohol intake, aspirin use, high cholesterol and body mass indexAmong women with hypertension, higher potassium intake was associated with lower all-cause mortality, but there was no association with any stroke outcome. |
| Whelton, 199890; Appel, 200191; Espeland, 199992; Banson, 199793; Appel, 1995 94; Kostis, 199895; Whelton, 199796Location: USSetting: CommunityDesign: Randomized Factorial Design individualStudy Name:Trial of nonpharmacological interventions in the elderly (TONE). | Study of: AdultsN: 681 for all endpoN: 681Intervention 1:% Male: NRMean Age/Range/Age at Baseline: NRRace: NRSystolic BP: NRDiastolic BP: NRMagnesium: NRCalcium: NROther Minerals: NRMean BMI: NR% with Hypertension: 100% with history of CVD: NR% with Type 2 diabetes: NR% with Kidney disease: NR% with history of Kidney stones: NRComparator:% Male: NRMean Age/Range/Age at Baseline: mean 66.5 (SD 4.6)Race: African American: 24%Systolic BP: NRDiastolic BP: NRMagnesium: NRCalcium: NROther Minerals: NRMean BMI: NR% with Hypertension: 100% with history of CVD: NR% with Type 2 diabetes: NR% with Kidney disease: NR% with history of Kidney stones: NRInclusion: Ages 60-80, SBP<145, DBP <85 while on anti-hypertensive medication, stable health, independence in daily living, capacity to alter diet and physical activity in accordance with the interventionExclusion: History of a stroke or heart attack within the last 6 months, current angina pectoris, CHF, insulin dependent diabetes, serious physical or mental illness, unexplained weight loss of more than 4.5 kg during the past year, BMI <21 (both sexes), BMI>33 (men), BMI>37(women), hyperglycemia, anemia. | Exposure Type: Urinary sodium excretionExposure Unit: mmol/dDuration: NRExposure to Follow Up Time: NRDose format: mean change in urinary sodium excretionQ1, Dose: plus 41Q2, Dose: plus 3Q3, Dose: minus 22Q4, Dose: minus 51Q5, Dose: minus 93 | Sodium measure: Single 24-hour urinary analysis without reported quality control measure, 24-hour diet recallBest sodium measure recorded: 2 times during enrollment, then at 9, and 18 months, and at the final follow upSodium, Method of Validation: 24-hour "diet recall"Sodium Status Arm 2: Net reduction of -39.8 mmol/dayPotassium measure: Single 24-hour urine analysis without validationBest potassium measure recorded: 2 times during enrollment, then at 9, and 18 months, and at the final follow upHow was blood pressure measured? BP measured while patients were in the seated position using Hawksley random-zero sphygmomanometers. SBP defined as the pressure at which the first Kortkoff sound was heard, DBP when the 5th sound could no longer be heard.CVD, CHD, stroke, kidney stones/disease Outcomes-Method of ascertainment: Interview with participant or proxy, medical records | Incidence of primary study endpoint, defined as: a (Primary end point defined as an average SBP >= 150 mm Hg, an average DBP >= 90 mm Hg, the resumption of BP medication, or a CVD event during followup (mean, 27.8 months)) (mmol/d/Outcome):Mean 27.8 months FUQ1 cases: NR, total: NR, Q2 cases: NR, total: NR, Q3 cases: NR, total: NR, Q4 cases: NR, total: NR, Q5 cases: NR, total: NRAdjustment: NRNo association between baseline dietary sodium intake or excretion and the risk of a primary study endpoint. The risk of a primary study endpoint increased with increased reduction in urinary sodium excretion. |