Publication of Dr Eman Mokbel Alissa

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Title: The controversy surrounding selenium and cardiovascular disease: a review of the evidence

Abstract: Selenium is an essential trace element that is an integral part of many proteins, with catalytic and structural functions. The antioxidant properties of some selenoproteins, such as glutathione peroxidase, may be particularly important in carcinogenesis and heart disease. The content of selenium in food depends on the selenium content of the soil where the plants are grown or the animals are raised. Moreover, the metabolism of selenium is determined by its dietary form: some forms are better utilized than others. Therefore, wide variations have been found in selenium status in different parts of the world. In animal studies, selenium deficiency is associated with cardiomyopathy and sudden death, as well as reduced T-cell counts and impaired lymphocyte proliferation and responsiveness. Abnormalities in liver function, brain, heart, striated muscle, pancreas and genital tract have also been reported. In humans, selenium deficiency has been implicated in the etiology of cardiovascular disease and other conditions in which oxidative stress and inflammation are prominent features, but there is still only limited evidence from epidemiological and ecological studies for this, and the therapeutic benefit of selenium administration in the prevention and treatment of cardiovascular diseases remains insufficiently documented. Interventions studies are currently in progress to assess the benefits of selenium supplements in primary and secondary prevention of atherosclerosis. The results to date are inconclusive and further controlled trials are needed.

Journal name: Med Sci Monit

Volume: 9

Issue No.: 1

Publishing year: 2003

Pages: RA9-18

Title: The effects of coadministration of dietary copper and zinc supplements on atherosclerosis, antioxidant enzymes and indices of lipid peroxidation in the cholesterol-fed rabbit.

Abstract: It has previously been shown that dietary copper can modulate the extent of atherosclerosis in the thoracic aorta of cholesterol-fed rabbits. The metabolism of copper and zinc are closely related, and it has been hypothesized that the balance of dietary copper to zinc may be important in determining coronary risk. Hence, we have investigated the interaction between dietary copper and zinc in atherogenesis in the New Zealand White rabbit. Juvenile male rabbits were randomly allocated to eight groups. Four groups were fed a normal chow diet with zinc (0.5%, w/w), copper (0.2%, w/w), copper plus zinc or neither in their drinking water for 12 weeks. Four other groups were fed a diet containing 0.25–1% (w/w) cholesterol plus zinc, copper, both or neither. Serum cholesterol of individual animals was maintained at approximately 20 mmol/l. Integrated plasma cholesterol levels were similar for all groups receiving cholesterol and significantly higher than those in the chow-fed groups (P < 0.001). Aortic copper concentrations were higher in the animals receiving cholesterol diets with copper compared to rabbits receiving normal chow and copper (P < 0.001). Aortic zinc content was significantly higher in cholesterol-fed rabbits supplemented with zinc alone or with copper than in those fed cholesterol alone (P < 0.001). Plasma ceruloplasmin concentrations were significantly higher in groups receiving cholesterol, irrespective of their trace element supplementation (P < 0.001). However, trace element supplementation increased the level significantly (P < 0.05). Trace element supplements did not appear to affect erythrocyte superoxide dismutase in the cholesterol-fed animals; however, zinc supplementation was associated with a significant increase in the enzyme in chow-fed animals (P < 0.05). The activity of the enzyme per mg of protein in aortic tissue was higher in animals receiving copper in the presence of cholesterol (P < 0.05) but not significantly so in its absence. Dietary trace element supplementation in cholesterol-fed animals was associated with a significant reduction in aortic lesion area. Plasma thiobarbituric acid-reactive substances and FOX concentrations were both significantly higher in the cholesterol-fed rabbits compared with the animals that fed on a chow diet (P < 0.001), and these were reduced significantly by dietary copper or zinc supplementation (P < 0.001). Hence, dietary supplements of copper or zinc at the doses used both inhibited aortic atherogenesis in the cholesterol-fed rabbits, although there was no significant additional effect when given in combination.

Journal name: Int J Exp Pathol

Volume: 85

Issue No.: 5

Publishing year: 2004

Pages: 265-75.

Title: Relationship between serum inflammatory markers and coronary risk score in Saudi males.

Abstract:

Journal name: the proceedings of the Assoc Clin Biochem national meeting

Volume:

Issue No.:

Publishing year: 2004

Pages: 71.

Title: Dietary macronutrient intake of Saudi males and its relationship to classical coronary risk factors

Abstract: Objective: To investigate whether the dietary intake of energy; macronutrients; and fiber differ between age groups, racial groups and socio-economic classes among males from the Western province of Kingdom of Saudi Arabia (KSA).

Methods: Data were collected from 303 male subjects, aged 15-80 years. They were selected randomly from King Abdul-Aziz University Hospital, Jeddah, KSA from October 2001 to November 2003 and grouped according to their age into 3 groups. The subjects were asked to complete a questionnaire concerning their demographic characteristics, health history, lifestyle, and dietary habits.

Results: Energy and carbohydrates intake fell with age (p<0.05). Total dietary carbohydrates and fat intake were similar for all groups when expressed as a percentage of energy intake. The percentage energy as protein increased with age (p<0.05). Mean cholesterol intake was high for all groups, but fell with age group (p<0.0001). Saturated fat and monounsaturated fat intake, expressed as percentage energy intake were both high, whereas polyunsaturated fat intake was low. The youngest group had the highest percentage energy provided by saturated fatty acid (p<0.001), and the lowest percentage energy as polyunsaturated fatty acid (p<0.05) compared to the other groups. The intake of fibre rose with age was significantly higher in the older group (p<0.05).

Conclusion: Diet consumed by urban dwellers in KSA appears to have resulted in an imbalance of macronutrient intake among all sectors of the population. This problem can only be averted by raising public awareness and the development of appropriate population-specific nutritional guidelines.

Journal name: Saudi Med J

Volume: 26

Issue No.: 2

Publishing year: 2005

Pages: 201-7

Title: Dietary vitamin A may be a cardiovascular risk factor in a Saudi population

Abstract: Traditional risk factors do not appear to explain fully the variation in the incidence of the cardiovascular diseases (CVD). Epidemiological studies have not been entirely consistent with regard to the relationship between antioxidant vitamin intake and CVD and there appears to be little data on this relationship in non-Caucasian populations. This study aimed to investigate the dietary intake of vitamin A, C, and vitamin E, and carotenoids, serum concentrations of vitamin E and A and indices of lipid peroxidation were measured in male Saudi patients with established CVD and age-matched controls. We assessed the dietary intakes of vitamins A, C, and E and carotenoids, by a food frequency questionnaire. Serum vitamins A and E concentrations were measured by HPLC, in 130 Saudi male subjects with established CVD, and 130 age-matched controls. We also determined serum lipid profiles (total cholesterol, triglycerides, HDL-C, LDL-C), lipoprotein (a), oxidized LDL, and serum lipid peroxide concentrations. Diabetes mellitus (P<0.0001), a positive smoking habit (P<0.0001) and hypertension (P<0.05) were more prevalent among CVD patients. Levels of dietary vitamin E and A were also significantly higher among cases. In conditional logistic regression analysis, the most significant characteristics differentiating CVD patients from controls were diabetes mellitus (Odds ratio 2.49, CI 1.42-4.37, P<0.001), total fat intake (Odds ratio 1.02, CI 1.01-1.03, P<0.01), serum vitamin A (Odds ratio 0.72, CI 0.53-0.99, P<0.05), and the vitamin A/total fat intake ratio (Odds ratio 1.04, CI 1.01-1.06, P<0.01). In a Saudi population, smoking habit and hypertension were significantly more common among patients with CVD. Multivariate analysis showed that dietary total fat and vitamin A and the presence of diabetes mellitus were independent coronary risk factors. This is the first report of a potentially deleterious effect of dietary vitamin A in a non-Caucasian population. However it is possible that unidentified residual confounding factors may account for this finding.

Journal name: Asia Pac J Clin Nutr

Volume: 14

Issue No.: 2

Publishing year: 2005

Pages: 137-44

Title: Trace elements status in Saudi diabetic patients with & without arthrosclerosis.

Abstract:

Journal name: Proceedings of the 12th international congress of endocrinology

Volume:

Issue No.:

Publishing year: 2005

Pages: 153

Title: High cardiovascular risk in young Saudi males: cardiovascular risk factors, diet and inflammatory markers

Abstract: Background: The relationship between coronary risk score (CRS), individual coronary risk factors and the serum inflammatory markers, high sensitivity C-reactive protein (hsCRP), ceruloplasmin (Cp), and soluble intercellular adhesion molecule-1 (sICAM-1) was studied in 140 Saudi males without clinically evident coronary heart disease (CHD).

Methods: One hundred forty subjects without clinically evident CHD were categorized into age tertiles. Demographic data together with an estimate of CRS using Framingham and PROCAM algorithms were obtained, and serum lipid profile, glucose, hsCRP, sICAM-1, and Cp were measured. Macronutrient intake was assessed by a questionnaire. The relationship between CRS, biochemical markers and diet was assessed by univariate and multivariate analysis.

Results: There was no significant difference in median hsCRP, sICAM-1 or Cp between the age groups. Serum Cp was positively associated with age (r =0.224, p <0.01) and FRS score (r =0.174, p <0.05). Serum sICAM-1 was negatively associated with PROCAM score (r =0.183, p <0.05). sICAM-1 was positively associated with HDL cholesterol (r =0.36, p <0.0001) among non-diabetics and negatively associated (r =0.397, p <0.05) among diabetic subjects. Age and dietary intake of saturated fatty acids together explained 7.9% of the variation in serum Cp level in a stepwise multiple regression model. Similarly 6.5% of the variation in serum sICAM-1 level was explained by the total cholesterol /HDL-C ratio. The youngest tertile of the group (<30 y) had the highest dietary intake of energy, fat and saturated fatty acids ( p <0.05), and also had a high prevalence of obesity, smoking and sedentary lifestyle.

Conclusion: We have demonstrated that there is a high prevalence of coronary risk factors and poor dietary intake within a Saudi male population, and that dietary factors are associated with serum sICAM-1 and ceruloplasmin but not hsCRP concentrations in this group.

Journal name: Clin Chim Acta

Volume: 365

Issue No.: 1-2

Publishing year: 2006

Pages: 288-96

Title: Trace element status of Saudi patients with established coronary heart disease and age-matched controls.

Abstract:

Journal name: Clin Chim Acta

Volume:

Issue No.:

Publishing year: 2005

Pages: S84

Title: Trace elements status in Saudi patients with established atherosclerosis

Abstract: Background: Traditional coronary risk factors do not fully explain variations in the incidence of cardiovascular disease (CVD). Epidemiological studies have implicated perturbations in selenium, copper, and zinc metabolism in the aetiology of CVD. However, these studies have been principally undertaken in Caucasian populations, in whom trace element intake is generally sufficient.

Method: We have measured serum and urine selenium, copper, and zinc; and superoxide dismutase, glutathione peroxidase, and lipid peroxide concentrations in 130 Saudi male subjects with established CVD, and 130 age-matched controls.

Results: Diabetes mellitus, positive smoking habit (po0.0001 for both), and hypertension (po0.05) were more prevalent among CVD patients. Urinary copper (po0.0001) and zinc (po0.05) were higher among controls. Serum selenium concentrations were lower among CVD patients (po0.001), and a high proportion (52%) had selenium levels below 79 mg/L compared to controls (22%) (po0.0001). Conditional logistic regression analysis, showed the characteristics differentiating CVD patients from controls were serum zinc (odds ratio (OR) 0.92, confidence interval (CI) 0.85–0.99, po0.05), serum copper/zinc ratio (OR 0.31, CI 0.10–0.96), serum selenium (OR 0.07, CI 0.02–0.31, po0.0001), and urine selenium (OR 3.34, CI 1.40–7.99, po0.01).

Conclusion: Measures of trace metals status appear to be associated with the risk of atherosclerosis in a Saudi male population.

Journal name: J Trace Elem Med Biol

Volume: 20

Issue No.: 2

Publishing year: 2006

Pages: 105-14

Title: Trace elements and CVD, a review of evidence

Abstract:

Journal name: J Clin Lab

Volume: 4

Issue No.: 1

Publishing year: 2006

Pages: 36-7

Title: [Relationship between indices of iron status and coronary risk factors including diabetes and the metabolic syndrome in Saudi subjects without overt coronary disease.](http://www.ncbi.nlm.nih.gov/pubmed/17980815?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)

Abstract: There have been inconsistent reports on the relationship between iron status and coronary artery diseases (CAD), and little data on this relationship in non-Caucasian populations. We assessed dietary iron by questionnaire and measured serum iron and ferritin levels in 270 Saudi male subjects without established CAD, 130 of whom were angiogram negative. Serum lipid profile, glucose, high sensitivity-C reactive protein (hs-CRP), serum soluble intercellular adhesion molecules-1 (sICAM-1), and caeruloplasmin were measured in all subjects. The angiogram negative patients, had lower serum ferritin (po0.05) and iron (po0.0001) levels than the 140 subjects without reported cardiovascular diseases (CVD). Serum iron correlated with serum triglycerides (po0.0001) and total cholesterol (po0.05) levels for this latter group and the groups combined. Serum ferritin correlated with serum total cholesterol and low-density lipoprotein (LDL)-cholesterol in the combined group (po0.05), and was correlated with blood glucose and serum LDL-cholesterol (po0.05) in the subjects without reported CVD. After adjustment for confounding variables, serum iron levels remained a significant correlate with total calorie intake and serum triglycerides. Serum ferritin also correlated significantly with cholesterol intake and fasting serum total cholesterol.

Dietary iron was significantly related to dietary cholesterol and fiber, age, smoking habits, and serum total cholesterol level.

Journal name: J Trace Elem Med Biol

Volume: 21

Issue No.: 4

Publishing year: 2007

Pages: 242-54

Title: Selenium Status and Cardiovascular Risk Profile in Healthy Adult Saudi Males

Abstract: The purpose of this research was to investigate the relationship between selenium levels, thyroid function and other coronary risk factors in 140 Saudi subjects without overt coronary heart disease stratified by age. Demographic data and serum fasting lipid profile, glucose, thyroid function tests, selenium status and dietary intake was assessed. The relationships between selenium status, thyroid function and cardiovascular risk factors were assessed by univariate and multivariate analysis. The results showed that thyroid hormone levels did not differ with age. Erythrocyte glutathione peroxidase (GPx) levels were significantly higher in the youngest vs. oldest tertile (p<0.0001). Selenium and iodine intake did not differ significantly with age tertile, but the average intake for the population sample was below the estimated average requirements for both elements. Serum lipoprotein (a) concentrations correlated with selenium (r = 0.417, p<0.0001) and TSH (r = 0.172, p<0.05). After adjustment for confounding variables; serum fT4 and erythrocytes GPx remained significant determinants of serum TSH levels, whilst serum selenium and TSH were determinants of serum fT4 levels. Serum Lp(a), a coronary risk factor, was strongly related to measures of selenium status. A significant relationship between measures of selenium status and thyroid function was found. Serum Lp(a) a known risk factor for cardiovascular disease was also related to selenium status in our population.

Journal name: [Molecules](http://www.mdpi.com/journal/molecules/index)

Volume: 14

Issue No.: 1

Publishing year: 2009

Pages: 141-159

Title: Iodine Deficiency amongst Hypothyroid Saudis

Abstract: The objective was to determine the prevalence of iodine deficiency among hypothyroid patients and the effect of dietary goitrogens on indices of iodine and thyroid status. This is a case-control study of 106 subjects who were recruited from King Abdulaziz University Hospital, Jeddah. Blood and urine were collected for serum thyroid hormones, thyroid autoantibodies, thyroglobulin (Tg) and urinary iodine concentration (UIC). Dietary iodine and goitrogenic food intake were assessed by questionnaire. Using World Health Organization (WHO) cutoff values for UIC, both controls and cases were iodine deficient (85% and 83%, respectively). Furthermore, dietary iodine was deficient in 23% of controls and 36% of cases. In cases, there was a positive association between UIC levels and serum thyroid stimulating hormone (r=0.405, p<0.01) and a negative association with serum fT4 (r=−0.358, p<0.01). Serum Tg antibody titers were also positively associated with dietary iodine (r=0.328, p<0.05). Patients with elevated serum autoantibodies had lower UIC and dietary iodine than those with normal serum autoantibodies. UIC was associated with dietary goitrogens including turnip (r=0.280, p<0.05) and pine (r=0.289, p<0.05) among cases. Iodine deficiency is common and the consumption of dietary goitrogens is high among euthyroid and hypothyroid subjects living in Jeddah.

Journal name: Biol Trace Elem Res

Volume

Issue No.

Publishing year: 2009

Pages

Title: Chromium status and glucose tolerance in Saudi Males with and without coronary artery disease.

Abstract: Chromium deficiency is associated with impaired glucose tolerance (IGT) and dyslipidemia. Hence, the objective of the current study was to investigate chromium status among Saudi men with and without established cardiovascular disease (CVD) and its relationship to glucose tolerance, lipid profile and other established CVD risk factors. We measured serum and urine chromium concentrations, fasted lipid profile, plasma glucose, and serum lipid peroxide in 130 Saudi men with an established history of myocardial infarction and 130 age-matched controls without established CVD. Patients with established CVD had higher serum triglycerides (p<0.05) and plasma glucose (p< 0.0001) and lower serum and urinary chromium concentrations (p<0.0001) than controls. Serum chromium was inversely correlated with plasma glucose among cases and controls (r=−0.189, p<0.05 and r=−0.354, p<0.00001, respectively). Plasma glucose (OR 1.127, CI 1.0–1.269, p<0.05), serum chromium (OR 0.99, CI 0.985–0.995, p<0.0001), and urinary chromium (OR 0.988, CI 0.981–0.995, p<0.001) were independently associated with the presence of established coronary disease applying this model. While chromium metabolism appears to be altered in individuals with CVD, it is unclear whether chromium supplementation would be effective in CVD prevention among patients with IGT. This would need to be tested in long-term outcome trials.

Journal name: Biol Trace Elem Res

Volume

Issue No.

Publishing year: 2009

Pages

Title: Determination of Insulin Resistance in Non- Diabetic Saudi Adults by the Incorporation of Fasting Free Fatty Acids into QUICK I.

Abstract: Most available diagnostic methods of insulin resistance are either unsuitable for screening or fail to detect marginal cases. It was reported that including plasma free fatty acids (FFA) into QUICK (quantitative insulin sensitivity check index) I improves its diagnostic power. The aim was to test the effectiveness of modified QUICK I against HOMA (homeostasis model assessment) and QUICK I in identifying insulin resistant subjects in the non-diabetic adult population. 357 healthy adults aged 18 -50 years were recruited randomly. Their anthropometric and demographic information were taken. Biochemical parameters and FFA (free fatty acid) were measured in fasting blood samples and used to calculate modified QUICK I. Reported cut-off point was used to identify IR subjects, who were matched for age and sex to individuals from the rest of the subjects. 209 subjects satisfied the criteria. 97 individuals were identified to be IR. This group had statistically different anthropometric and biochemical parameters compared to NIR group. Biochemical parameters did not differ significantly when QUICK I was used to identify IR subjects. The modified QUICK I for all subjects correlated significantly (p = 0.01) with HOMA values (r = -0.756) and with QUICK I values (r = 0.758). Modified QUICK I is a more powerful diagnostic index of IR in Saudi non diabetic adults.

Journal name: International Journal of Medicine and Medical Sciences

Volume: 1

Issue No.: 9

Publishing year: 2009

Pages: 365-369