

## Assessing Antioxidant Micronutrients Status and Risk of Cardiovascular Diseases among Type 2 Diabetic Outpatients in Ghana

Odeafu Asamoah-Boakye, Charles Apprey and Reginald A. Annan  
Kwame Nkrumah University of Science and Technology, Ghana

**Background:** Dyslipidemia is a major risk factor of cardiovascular diseases, which in turn contribute 68% of mortality among type 2 diabetes. Conversely, intakes of antioxidant micronutrients can delay or prevent diabetic complications such as cardiovascular diseases. The study aimed to assess antioxidant micronutrient status and risk of CVDs among Type 2 Diabetic Outpatients.

**Methods:** A cross sectional study was conducted on type 2 diabetics. Dietary intakes of antioxidant micronutrients were assessed using 24-hour dietary recall. Anthropometrics including Body Mass Index, waist circumference, and biochemical indices, including glycated haemoglobin (HbA1c), fasting blood glucose (FBG), coronary risk, atherosclerosis risk, serum zinc and lipids profile were measured in 152 participants. Data were analyzed using SPSS version 23.

**Results:** Thirty-seven (24.3%) were males and 115 (75.7%) were females. Also, 74.3% of type 2 diabetes patients had high FBG and 64.6% had high HbA1c. The prevalence of single dyslipidemia, combined dyslipidemia and mixed dyslipidemia were 63.8%, 15.8%, and 1.3% respectively. Also, 35.3% of subjects had high coronary risk and 5.3% had high atherosclerosis risk. The mean intakes of zinc ( $5.04 \pm 2.76$  mg/day), vitamin E ( $5.16 \pm 2.60$  mg/day) and vitamin C ( $82.72 \pm 38.76$  mg/day) were lowered among type 2 diabetes patients. When controlling for age and gender, inadequate vitamin E was directly associated with HbA1c, ( $r=0.220$ ,  $p=0.033$ ), Total Cholesterol (TC), ( $r=0.260$ ,  $p=0.011$ ), Low density lipoprotein Cholesterol (LDL-C) ( $r=0.267$ ,  $p=0.009$ ) and coronary disease risk ( $r=0.217$ ,  $p=0.036$ ). Coronary risk was strongly associated with TC ( $r=0.690$ ,  $p<0.0001$ ) and LDL-C, ( $r=0.783$ ,  $p<0.0001$ ), while atherosclerotic risk correlated with serum Triglycerides (TG), ( $r=0.817$ ,  $p<0.0001$ ) and VLDL-C, ( $r=0.817$ ,  $p<0.0001$ ). Serum zinc was reduced among participants and had inverse relationship with glycated haemoglobin ( $r=-0.206$ ,  $p=0.05$ ) and fasting blood glucose ( $r=-0.227$ ,  $p$  value = 0.033). Regression analyses revealed that a point increase in TC was associated with 2.6-folds increased odds of coronary disease risk (OR= 2.6, 95% CI=1.9-3.7,  $p<0.0001$ ), TG was associated with 2-folds higher coronary risk (OR= 2.5, 95% CI= 1.3-4.8,  $p=0.004$ ), and LDL-C was associated with 5- folds higher coronary disease risk (OR= 4.9, 95% CI=2.9-8.1,  $p<0.0001$ ) among participants.

**Conclusion and Recommendation:** Uncontrolled blood glucose and atherogenic dyslipidemia was common among these diabetics, were significantly associated with high coronary disease risk, and atherosclerotic risk. Management of diabetes in Ghana needs a critical look at to increase effectiveness and reduce the burden of the disease.

### Biography:

Odeafu Asamoah-Boakye is a graduate research student in Nutrition and Dietetics at Kwame Nkrumah University of Science and Technology. He is also attended 4 international conferences in Ghana, and made one oral presentation. He is a young scientist who has to my credit 2 publications and 4 manuscripts under review. He is highly motivated research and has engaged in PhD research volunteer in my institution. His research areas have been diabetes, obesity and cardiovascular diseases.