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Original Article

The Association between Dietary Antioxidant Indices and Cardiac Disease: Baseline Data of Kharameh Cohort Study

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ABSTRACT

Introduction: Oxidative stress contributes to the development of cardiovascular disease. Tools for evaluating the anti-inflammatory and antioxidative characteristics of an individual's diet as a whole may be valuable for assessing the combined effects of dietary antioxidants on health. This population-based study aimed to investigate the association between dietary antioxidants and cardiac disease.
Methods: In this population-based cross-sectional study, 10439 individuals aged 40-70 years were recruited during 2014-2017 in Kherameh cohort study which is a part of the Prospective Epidemiological Research Studies in Iran (PERSIAN). The food frequency questionnaire (FFQ) with 130 food items was used to assess the dietary intakes. Vitamin A, E, C, selenium, zinc and Manganese intakes were used to compute dietary antioxidant index (DAI) and dietary antioxidant quality score (DAQs). Chi-square and independent sample T-test was used for comparing qualitative and quantitative variables between the groups respectively Logistic regression analysis was applied for evaluating the association between cardiac disease, DAI and DAQS score after adjusting for covariates.
Results: The participants' mean age was 52.1±8.3 years. Among all, 4356 (41.7%) were overweight and 1892 (18.1%) were obese. According to the results, odds of cardiac diseases decreased by increasing DAI score (OR=0.80, P value<0.001), Odds of cardiac diseases increased by lower DAQS after adjusting for demographic variables including age, sex, BMI, Marital status and hypertension (OR=0.799, P value=0.002).
Conclusion: The role of anti-oxidants in reducing the odds of cardiovascular disease is very important. Our results highlighted that DAQS and DAI had protective effect on the odds of cardiovascular disease. Therefore, it is suggested that anti-oxidants as zinc, manganese, selenium, and vitamins A, E and C should be taken through food to reduce the risk of the disease.

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poor dietary antioxidant indices, highlighting the need for nutritional antioxidants.[33] Furthermore, another study found that the risk of multiple sclerosis was double in individuals with low DAI values. That study found an important dose-response pattern, concluding that adequate dietary antioxidant intake might reduce the risk of developing multiple sclerosis.[52] Finally, lower odds of having non-alcoholic fatty liver disease were associated with higher DAI values with and without adjustments for confounding variables.[53] These results highlight the same pattern as that observed in our study, indicating that dietary antioxidants work together to reduce the risk of many non-communicable diseases.

Limitation

One limitation of our study is the indices; we did not consider some of non-nutritive antioxidant like carotenoids or polyphenols with anti-oxidant properties and just considered some major antioxidants. Another limitation was the cross-sectional design of the study of the baseline data collection for a population-based cohort, that cannot represent causal effects of the variables.

Conclusion

The role of anti-oxidants in reducing the odds of cardiovascular disease is very important. Our results highlighted the fact that DAQS and DAI had protective effects on the odds of atherosclerosis. Thus, it is suggested that dietary anti-oxidants as vitamins A, E and C, zinc, Manganese, and selenium should be taken to reduce the risk of cardiac disease. It will be advantageous to investigate the sensitivity and specificity of DAI in different aspects in order to apply them in clinical works.

Declaration

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Availability of data and materials

The datasets used and analyzed during the current study are available by sending an email to the owner of data (Abbas Rezaianzadeh).

Consent for publication

Not Applicable.

Competing interests

The authors report no conflict of interest.

Authors' contributions

Study concept and design: PK; Acquisition of data: MGJ, AR, SVH, and RR; Analysis and interpretation of data: PK, and MJ; Drafting of the manuscript: PK, and MJ; Critical revision of the manuscript for important intellectual content: PK, MJ, and MGJ; Statistical analysis: MJ; Administrative, technical, and material support: MGJ, AR, SVH, and RR;