

# Antioxidants and heart disease; current knowledge

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## Core tip

Antioxidants, which are available as different compounds in foods are able to fight free radicals, by which some diseases can be prevented. A diet rich in antioxidant-containing foods, such as fruits, vegetables and whole grains, is correlated to a decreased chance of cardiovascular disease.

In the past decade, the media has given diverse advices over the intake of vitamin E, such as ‘Take vitamin E to fight heart disease’ or ‘do not take vitamin E’. These contradictive advices confuse people about the best way to prevent heart diseases. In fact, antioxidants can prevent various chronic diseases (1). Epidemiological studies have mainly indicated the benefits of antioxidants, especially antioxidants from fruits and vegetables. However, it is not easy to assess the antioxidant intake over a long period. Only supplementary intake of antioxidants could be assessed precisely (1). The “antioxidant” definition is not clearly known and may consist of a vast range of substances, including proteins, lipids, carbohydrates and DNA, with different mechanisms. For example, preventing or delaying roles for cardiovascular diseases (CVD) (2,3) which has been studied to find out a preventive strategy (4). Moreover, epidemiological studies have shown that taking higher amounts of antioxidants such as fruits and vegetables could decline the rates of CVD, probably due to their antioxidant effects (5-7). However, numerous other studies have reported some evidences for an inverse relationship between CVD and antioxidant intake, especially vitamin E supplements (8). In the last decades, numerous studies have been conducted to detect the favorable effects of different medications for their own antioxidant properties such as statins, calcium antagonists and angiotensin converting enzyme inhibitors (8). Moreover, the inverse relationship of lycopene with atherosclerosis has been observed as well (9). Additionally, antioxidants have two

main effects; effect on the stability of foods and having positive effects on human health (10).

Worldwide distribution of CVD, as an important public health problem, has been demonstrated in many studies by presenting associations with many factors such as the effect of free radicals (and antioxidants) and their substantial role on CVD and atherosclerosis (4). In addition, there was an association between declining the morbidity and mortality of CVD and increasing consumption of antioxidants, specially vitamins E and C (11). Furthermore, in hemodialysis patients with prevalent CVD, supplementation of 800 IU/d vitamin E could reduce CVD endpoints and myocardial infarction (12).

Free radicals and antioxidants are important in several diseases, including CVD; however, their effects on health are different maybe due to age, lifestyle, physical activity, genetic polymorphism, nutritional factors and environmental factors as the reasons of the variable effects of antioxidants (8). In fact, more physical activity, consumption of diets with more antioxidants and controlling blood glucose and lipids can increase the positive effects of antioxidants on CVD (8). However, it should be kept in mind that in CVD patients, administration of antioxidants cannot reverse the changes. However, antioxidants could reduce the complications of CVD (13). Furthermore, there are several nuts with a large content of antioxidants including walnuts, pecans and chestnuts (14) which numerous researches have revealed a huge reduction in CVD death by using nut/peanut consumption (14).

As a conclusion, antioxidants, which are available as different compounds in foods are able to fight free radicals, by which some diseases can be prevented. In absence of sufficient proportion of antioxidants, free radicals could damage the cells. The free radicals are mainly formed by environmental pollutants (e.g. smoking cigarette) and by common activities of the body. A part of this cellular damage may lead to oxidation of cholesterol. Even if supplements containing antioxidants do not have any significant influence on decreasing heart problems, foods that are sources of antioxidants are still advised. There are benefits of getting vitamins in food that are not necessarily provided in supplement form. For example, foods rich in antioxidants may have nutrients such as flavonoids and lycopenes, which are not necessarily included as standard oral vitamin supplements.

#### Authors' contribution

Arman Amiri and Armin Amiri both searched and gathered the related articles, prepared the draft and edited the final manuscript equally. All authors read and signed the final paper.

#### Conflicts of interest

The authors declare no conflicts of interest.

#### Ethical considerations

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