Annals of Research in Antioxidants

http annresantioxidants.com

Antioxidants; helpful or harmful?

Tina Jafari[1,2*]

[1]Medical Plants Research Center, Shahrekord University of Medical Sciences, Sharhekord, Iran
[2]Department of Biochemistry and Nutrition, Faculty of Medicine, Shahrekord University of Medical Sciences, Shahrekord, Iran

Correspondence to:
Tina Jafari,
Email: tinajafari15@yahoo.com

Received: 2 April 2016
Accepted: 18 April 2016
ePublished: 25 April 2016

Keywords: Free radicals, Reactive oxygen species, Antioxidants, Oxidative stress

Citation: Jafari T. Antioxidants; helpful or harmful? Ann Res Antioxid. 2016;1(2):e13.

Core tip

Recent researches indicate an increased interest among people and researchers for the use of antioxidant supplements beside or in place of other treatments. In some cases, these drugs are useful, but there are some evidences of ineffective or even harmful aspects of these supplements. Being aware of the efficacy and side effects of these drugs are very important for administrators.

Introduction

In the past, infectious diseases were the major causes of mortality among the human population. Now, improvement of medical sciences and recognition of useful broad-spectrum antibiotics, along with the promotion of personal and global hygiene reduce the risk of these diseases and deaths caused by them.

The modern sedentary lifestyle and easy access to variety of unhealthy food sources have brought chronic diseases for people. A low-grade inflammation and increasing the level of oxidative stress in body are the major causes of such diseases (1). Increasing prevalence of problems such as cardiovascular diseases, diabetes and cancers are the most important health concerns that dedicate a great deal of therapeutic expenses for governments and people throughout the world (2).

Nowadays, people are more involved in their health than before. Recent researches show that an increasing interest is growing among people and researchers through the use of antioxidant supplements beside or in place of other treatments (3). Beta-carotene, vitamin A, C, E, and supplements containing polyphenols and other phytochemicals, are widely used in order to improve health status or as anti-aging drugs (4).

In some cases, these drugs have been useful, but there are some evidences of ineffective or even harmful aspects of these supplements. Bjelakovic et al evaluated the beneficial effects of these drugs via a systematic review (5). They not only did not demonstrate rational evidence in this regard, but also found that beta-carotene, vitamins A and E may increase mortality. Carotenoids are widely natural herbal antioxidants which are belonged to the large classes of terpenoids. They are also known as the precursors of vitamin A. Researches showed that carotenoids can interfere with the activity of membrane transporters and therefor may interact with drugs or anti-cancer treatments. In addition, vitamins A and E as fat soluble vitamins can accumulate in the body and cause toxicity and disease.

Flavonoids, the secondary plant metabolites, are natural polyphenols and best known as different color pigments (yellow, orange, red and dark violet). They are found in vegetables and are important for the plant physiology, growth, development and defense mechanisms. Several studies have demonstrated the health benefits of these metabolites and their preventive effects against cell damage and DNA destruction (6). The bioavailability of flavonoids is influenced by the health condition of the digestive system, the inter-individual differences due to the microbial flora and digestive enzymes. The food ingredients (e.g. dietary fiber, divalent minerals, and protein-rich meals, dietary lipids and carbohydrates, etc.) are also important. The most important role discussed for flavonoids is their antioxidative activity (7). However, under certain conditions, they (like many other antioxidants) can act as pro-oxidants, for example in systems containing redox-active metals (copper and iron).

The marketing of these drugs and the general population trend to anti-aging supplements and procedures is going to be increased. These supplements are also produced in various forms with an elegant color and packaging by pharmaceutical companies. In ad-

Copyright © 2016 The Author(s); Published by Society of Diabetic Nephropathy Prevention. This is an open-access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

dition, physicians are sometimes under pressure by their patients to prescribe these supplements. However, it is worth noting that at least in our country, natural foods like whole grains, fruits and vegetables are considered as safe, good, and non-expensive sources of these components which provide more additional benefits for consumers (8). Evidence suggests that unlike the increased consumption of refined and processed foods, the use of natural foods has been decreased compared to the past. Although in some situation prescription of antioxidants seems inevitable, trying to inform people about proper nutrition and life style modification is considered very important for prevention of chronic diseases (9). Being aware of the efficacy and side effects of these products are very important for administrators. It is also important to put reasonable legal rules for their prescription in order to avoid adverse effects as well as wasteful drug administration.

Conclusion

Antioxidants are useful components of natural foods. People can obtain them by eating variety of foods like colorful fruits, vegetables, and whole grains. Antioxidants protect cells and their organelles from detrimental effects of free radicals and oxidative agents. Sometimes consumption of natural antioxidant agents is not enough to control the oxidative stress in the body and it is necessary to prescribe antioxidants as supplements. It is logical that these situations were recognized by physicians to avoid drug abuse.

Author's contribution

TJ is the single author of the manuscript.

Conflicts of interest

The author declared no competing interests.

Ethical considerations

Ethical issues (including plagiarism, data fabrication, and duplicate publication) have been completely observed by the author.

Funding/Support

None.

References

1. Bjelakovic, Goran, Dimitrinka Nikolova, and Christian Gluud. Antioxidant supplements to prevent mortality. JAMA. 2013; 310:1178-9.
2. Gülçin I. Antioxidant activity of food constituents: an overview. Arch Toxicol. 2012;86:345-91.
3. Halliwell B. The antioxidant paradox: less paradoxical now? Br J Clin Pharmacol. 2013;75:637-44.
4. Bast A, Haenen GR. Ten misconceptions about antioxidants. Trends Pharmacol Sci. 2013;34:430-6. 24.
5. Bjelakovic G, Nikolova D, Gluud LL, Simonetti RG, Gluud C. Antioxidant supplements for prevention of mortality in healthy participants and patients with various diseases. Sao Paulo Med J. 2015;133:164-5.
6. Agati G, Azzarello E, Pollastri S, Tattini M. Flavonoids as antioxidants in plants: location and functional significance. Plant Sci. 2012;196:67-76.
7. Sumczynski D, Bubelová Z, Sneyd J, Erb-Weber S, Mlcek J. Total phenolics, flavonoids, antioxidant activity, crude fibre and digestibility in non-traditional wheat flakes and muesli. Food Chem. 2015;174:319-25.
8. Podsędek A. Natural antioxidants and antioxidant capacity of Brassica vegetables: a review. LWT-Food Science and Technology. 2007;40:1.
9. Bjelakovic G, Nikolova D, Gluud LL, Simonetti RG, Gluud C. Mortality in randomized trials of antioxidant supplements for primary and secondary prevention: systematic review and meta-analysis. JAMA. 2007;297:842-57.