www.nephropathol.com DOI:10.12860/JNP.2013.26 J Nephropathology. 2013; 2(2): 152-153

Journal of Nephropathology

Plants antioxidants: From laboratory to clinic

Mahmoud Rafieian-Kopaei[1], Azar Baradaran[*,2], Morteza Rafieian[1]

[1] Medical Plants Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran.
[2] Department of Pathology, Isfahan University of Medical Sciences, Isfahan, Iran.

ARTICLE INFO

Article type:
Letter to Editor

Article history:
Received: 5 January 2013
Accepted: 28 January 2013
Published online: 1 April 2013

Keywords:
Free radicals
Nephrotoxicity
Antioxidants

Implication for health policy/practice/research/medical education: Eating whole vegetables, fruits and grains, which all are rich in antioxidants, provides protection against most of oxidative stress induced diseases, however, this does not mean that antioxidants will prevent or fix the problem, especially not when they are taken out of their natural context. It should be noted that although the results of the studies are inconclusive, but most of the studies conducted till now have had limitations due to their relatively short duration and conducting on patients with existing diseases.

Please cite this paper as: Rafieian-Kopaei M, Baradaran A, Rafieian M. Plants antiox-idants: From laboratory to clinic. J Nephropathology. 2013;2(2):152-153, DOI: 10.12860/JNP.2013.26

Letter to editor

Dear Editor,

Free radicals are usually generated in the body as byproducts of turning food into energy or by sunlight's action on the skin and eyes (1). They all have a great appetite to steal electrons from any nearby substances and alter their structures or functions. Although oxidation reactions are crucial for life, they can also be damaging. Free radicals can damage and change the instructions of a DNA. They are able to alter a cell's membrane and change the flow of what enters or leaves the cells. It may also change a circulating low-density lipoprotein (LDL) molecule so that it gets trapped easily in an artery wall (2). The body is not defenseless against these free radicals. Antioxidants work by giving electrons to free radicals without turning into electron-scavenging substances themselves. It should be noted that some substances that act as antioxidants in one situation may act as prooxidants in other situations (2). Antioxidants are different substances such as vitamin C, vitamin E, carotenoids, minerals such as selenium and manganese, as well as glutathione, coenzyme Q10, lipoic acid, phytoestrogens, flavonoids, phenols, polyphenols, and so on (3-5). Antioxidants have come to attention since 1990s, when scientists found that free radicals were involved in atherosclerosis, vision loss, cancer and some of other chronic diseases. They found that people with low intake of vegetables and fruits were at greater risk for development of these diseases than others. Clinical trials began testing the impact of single substances such as vitamin E, vitamin C and beta-carotene against cancer, heart disease and others. Although free radicals contribute to chronic diseases such as cancer (6,7), diabetes (8,9), atherosclerosis (7,8), heart disease , nephrotoxicity, hepatotoxicity, cognitive (6-9) and vision loss (10) and a lot of researches, especially laboratory trials, show benefits for antioxidants against these conditions, however, long clinical trials are inconclusive and do not show that antioxidant supplements have a substantial impact on these diseases. While it is believed that substances found naturally in vegetables, fruits, and grains help

*Corresponding author: Prof. Mahmoud Rafieian-Kopaei, Medical Plants Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran. Tel: +98 381 334 6692, Fax: +98 381 333 0709, Email: rafieian@yahoo.com

prevent a variety of chronic diseases, it is unlikely that antioxidants in all conditions can do the same. The results of the large studies offer little evidence that taking vitamin E, vitamin C, beta-carotene, or other single antioxidants protect against these diseases (6-9). Two studies even showed that taking beta-carotene may actually increase the chances of developing lung cancer in smokers (11,12). While the results of the large studies offer little evidence that taking vitamin E, vitamin C, beta-carotene, or other single antioxidants protect against cancer, atherosclerosis and other chronic diseases, the findings about combinations are also complicated and not entirely clear (12). Why natural whole products such as vegetables and fruits are able to prevent or cure a variety of chronic diseases in clinical trials but single antioxidants or even their combination do not act the same, is not clear. What is clear is that antioxidants almost certainly evolve as parts of elaborate networks. This means that no single substance can do the work of the whole crowd (2). In conclusion free radicals may contribute to chronic diseases such as nephrotoxicity, heart diseases, cancer and Alzheimer. Although abundant evidence suggests that eating whole vegetables, fruits and grains, which all are rich in antioxidants, provides protection against most of these oxidative stress induced diseases, however, this does not mean that antioxidants will prevent or fix the problem, especially not when they are taken out of their natural context. It should be noted that although the results of the studies are inconclusive, but most of the studies conducted till now have had limitations due to their relatively short duration and conducting on patients with existing diseases.

Authors' Contribution

MR prepared the sources, MRK prepared the draft and AB edited the article.

Financial Disclosure

No financial support by any institution.

Conflict of interest

None to declare

References

1. Serafini M, Morabito G. The Role of polyphenols in the modulation of plasma non-enzymatic antioxidant capacity (NEAC). Int J Vitam Nutr Res. 2012; 82(3):228-32.
2. Knight JA. Review: Free radicals, antioxidants, and the immune system. Ann Clin Lab Sci. 2000; 30 (2): 145-158.
3. Grodstein F, Kang JH, Glynn RJ, Cook NR, Gaziano JM. A randomized trial of beta-carotene supplementation and cognitive function in men: the physicians' health study II. Arch Intern Med. 2007; 167:2184–90.
4. Lee IM, Cook NR, Gaziano JM, Gordon D, Ridker PM, Manson JE, et al. Vitamin E in the primary prevention of cardiovascular disease and cancer: the women's health study: a randomized controlled trial. JAMA. 2005;294(1):56-65.
5. Hennekens CH, Buring JE, Manson JE, et al. Lack of effect of long-term supplementation with beta-carotene on the incidence of malignant neoplasms and cardiovascular disease. N Engl J Med. 1996; 334:1145–49.
6. Shirzad H, Taji F, Rafieian-Kopaei M. Correlation between antioxidant activity of garlic extracts and WEHI-164 fibrosarcoma tumor growth in BALB/c mice. J Med Food. 2011; 14(9):969-74.
7. Shirzad H, Shahrani M, Rafieian-Kopaei M. Comparison of morphine and tramadol effects on phagocytic activity of mice peritoneal phagocytes in vivo. Int Immunopharmacol. 2009; 9(7-8):968-70.
8. Behradmanesh M, Ahmadi M, Rafieian-kopaei M. Effect of diabetan on blood glucose, glycosylated hemoglobin, lipid profile, liver and kidney function tests of diabetic patients: A clinical, double blind, randomized trial. Afr J Pharm Pharmacol. 2013; 7(2): 50-53.
9. Behradmanesh M, Ahmadi M, Rafieian-kopaei M. effect of glycogol on blood glucose level of patients with type II diabetes. Iran J Endocrinol Metab. 2012; 14 (2):163-168.
10. Bartlett HE, Eperjesi F. Effect of lutein and antioxidant dietary supplementation on contrast sensitivity in age-related macular disease: a randomized controlled trial. Eur J Clin Nutr. 2007; 61:1121-27.
11. Albanes D, Heinonen OP, Taylor PR, Virtamo J, Edwards BK, Rautalahti M, et al. Alpha-tocopherol and beta-carotene supplements and lung cancer incidence in the alpha-tocopherol, beta-carotene cancer prevention study: effects of base-line characteristics and study compliance. J Natl Cancer Inst. 1996; 88:1560-70.
12. Omenn GS, Goodman GE, Thornquist MD, et al. Effects of a combination of beta-carotene and vitamin A on lung cancer and cardiovascular disease. N Engl J Med. 1996; 334:1150-55.