

## Natural Antioxidants for Health

Ayushi Goyal\*

Department of Bioscience and Biotechnology, Banasthali Vidyapith, Rajasthan, India

### ABSTRACT

This review aims to provide a literature survey on how the Natural Antioxidants. Continuous exposure of the skin to oxidative stresses leads to the formation of the reactive oxygen species with in body, skin and cell of the host organism. The accumulation of these reactive species can result in the damage to cellular DNA and cell membrane lipids and proteins. Damage to these organelles produces free radicals that start a vicious cycle that can lead to increase cell damage and senescence. To overcome this problem, our skin contains the cutaneous antioxidants, but it soon gets depleted on exposure to UV rays and also because of environmental stresses. The overload of these oxidative stresses will lead to chronic and degenerative diseases like cancer, autoimmune disorder, aging, cataract, rheumatoid arthritis, cardiovascular and neurodegenerative diseases. These antioxidants have to be replenished to overcome these oxidative stresses. Therefore the use of natural antioxidants is a promising strategy to with respect to oxidation of cells.

**Keywords:** Antioxidants; Free radicals; Cutaneous antioxidants; Oxidative stress; Deleterious effect; Replenish

### INTRODUCTION

Oxidation is a process or a chemical reaction that produces free radicals that through a series of chain reaction can damage the cell and antioxidants are molecules that prevent the oxidation of other cells. Oxygen is an inseparable part of our life [1]. Cells utilize oxygen when we breathe in in order to produce energy, as a consequence of which free radicals are created along with the ATP formation. These are called as Reactive Oxygen Species (ROS) and sometimes Reactive Nitrogen Species (RNS) formed as a result of cellular redox process [2]. If these ROS and RNS are present at a relatively low or at moderate level then they'll have beneficial effects on the cellular responses and immune functions. But if they are present in large amount then will lead to oxidative stress and will exert deleterious damaging effect to the host body. So antioxidants have been used to promote health and minimize the chances and risk of occurrence of various cardio and neurodegenerative diseases [3-7].

Plants and animals usually maintain a complex system of overlapping antioxidants. They have a much more concentration of these natural antioxidants that have a potential therapeutic effect against several chronic problems and diseases [8]. This works towards meeting the growing demand of preventive health

measures of public. So, they have been used to promote healthy lifestyle and prevention from various cardiovascular diseases, arteriosclerosis, diabetes, aging, etc. [4,9-11].

From ancient times, people have been using herbs and spices for improving and for enhancing the duration of their life. These herbs and spices are rich in antioxidants and and even have a low calorific value. These antioxidants have none or very few side-effects [6,12].

### Effect on health

This has become a topic of debate that which anti-oxidant is beneficial form of food and vitamin and in what amount it must be consumed that it does not have any deleterious effect on health [13]. Most of the previous studies have suggested that antioxidant vitamins could prevent chronic diseases while some oppose the fact and take as to be misguided from the beginning [8-14]. Polyphenol are considered to be having antioxidant activity in-vitro while in in-vivo conditions they are not as their metabolism rate is very high [15-17]. Natural antioxidants, that is from our diet plays an important role in the nullifying the deleterious effect by oxidative stress by enhancing the activity of endogenous antioxidants. Vitamin E: It is a highly potent

\*Correspondence to: Ayushi Goyal, Department of Bioscience and Biotechnology, Banasthali Vidyapith, Rajasthan, India, Tel: 7742089005; E-mail: angelgoel16@gmail.com

Received: December 04, 2018; Accepted: December 31, 2018; Published: January 31, 2019

Citation: Goyal A (2019) Natural Antioxidants for Health. Trop Med Surg 7:223. doi: 10.35248/2329-9088.7.1.223.

Copyright: © 2019 Goyal A. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

antioxidant. It helps in reducing the risk of various cardiovascular diseases, colon, breast and prostate cancer, ischemia, cataract, arthritis and even some neurological disorders. Vitamin C: it is essential for the biosynthesis of neurotransmitters, collagen and carnitine. It works synergistically with vitamin E [18]. This works in preventing from lung and colorectal cancer and reduces the chances of stomach cancer. Beta-carotene: it gets converted to retinol and is essential for vision. It works towards the prevention from the breast and prostate cancer. Lycopene: This also possesses antioxidant and ant proliferative properties [11-19]. It prevents from cardiovascular disease and several skin problems [20]. There are also many more antioxidants present nutrients that are selenium, flavonoids, omega 3 and omega 6 fatty acids [18-21].

### How they work

Antioxidants work in several ways depending on the part they interfere with in lipid oxidation pathway. On that basis they can be oxygen scavengers, quenchers, antioxidant regenerators, primary antioxidants and secondary antioxidants [22]. The properties of these antioxidants depend on the molecular structure of the compound. There are a variety of methods by which we can analyse the properties of these antioxidants and that can be helpful in evaluating the antioxidant mechanism of a compound [16,22-25]. Antioxidant activity is determined by hydrolysis condition.

### LIMITATIONS

They are sensitive to heat and light and are very much unstable leading to the loss in their bioactivity that may limit their application

They have an unpleasant taste [26]

Have reduced bioavailability

Non-polar antioxidants, such as eugenol (present in clove oil in max amount) have toxicity limits [27,28].

There is a limit to the type and quantity of the antioxidant consumed in the diet

Consumption of certain antioxidants can by certain individuals like smokers and is deleterious to their health like, beta-carotene and retinol consumption by them can cause lung cancer [29-33].

### CONCLUSION

In the etiology of several degenerative and chronic diseases suggest that the antioxidant therapy can be a promising solution. This therapy can be further used in future for prevention from several life threatening and chronic deleterious diseases. This can be helpful for prevention from diabetes, cardiovascular diseases, neurodegenerative disorders, ischemia, several problems and many more. There are still several positives that still need to be discovered. This therapeutic technique can be a promising future landmark for the growing preventive life from several diseases and increasing their life. Further research is required for having this technique as an adjuvant. For having

these to be as a landmark as a future therapeutic several research must be done also involving the proper analysis of the type and quantity of antioxidant present within your diet and the quantity that must be acceptable by your body. Natural antioxidants can definitely be the promising solutions for future therapeutics.

### REFERENCES

- Halliwell B, Gutteridge JMC. Free radicals in biology and medicine 4th Oxford, UK: Clarendon Press. 2007.
- Bahorun T, Soobrattee MA, Luximon-Ramma V, Aruoma OI. Free radicals and antioxidants in cardiovascular health and disease. *Internet J Med Update*.2006;1:1-17.
- Valko M, Izakovic M, Mazur M, Rhodes CJ. Role of oxygen radicals in DNA damage and cancer incidence. *Mol Cell Biochem*. 2004;266:37-56.
- Valko M, Leibfritz D, Moncola J, Cronin MD. Free radicals and antioxidants in normal physiological functions and human disease *Int J Biochem Cell Biol*.2007;39:44-84.
- Droge W. Free radicals in the physiological control of cell function. *Review Physiol Rev*. 2002;82:47-95.
- Willcox JK, Ash SL, Catignani GL. Antioxidants and prevention of chronic disease. *Review Crit Rev Food Sci Nutr*. 2004;44:275-295.
- Pacher P, Beckman JS, Liaudet L. Nitric oxide and peroxynitrite in health and disease *Physiol Rev*. 2007;87:315-424.
- Genestra M. Oxyl radicals, redox-sensitive signalling cascades and antioxidants *Review Cell Signal*.2007;19:1807-1819.
- Halliwell B. Biochemistry of oxidative stress. *Biochem Soc Trans*. 2007; 35:1147-1150.
- Young I, Woodside J. Antioxidants in health and disease *J Clin Pathol*.
- Valko M, Rhodes CJ, Moncol J, Izakovic M. Free radicals, metals and antioxidants in oxidative stress-induced cancer Mini-review *Chem Biol Interact*. 2006;160:1-40.
- Valko M, Morris H, Cronin MTD. Metals, toxicity and oxidative stress. *Curr Med Chem*.2005;12:1161-1208.
- Firuzi O, Miri R, Tavakkoli M, Saso L. Antioxidant therapy: current status and future prospects. *Curr Med Chem*. 2011;18:3871-3888.
- Madeo F, Pietrocola F, Eisenberg T, Kroemer G. Caloric restriction mimetics: towards a molecular definition. *Nat Rev Drug Discov*. 2014;13:727-740.
- Munir K M, Chandrasekaran S, Gao F, Quon MJ. Mechanisms for food polyphenols to ameliorate insulin resistance and endothelial dysfunction: therapeutic implications for diabetes and its cardiovascular complications. *Am J Physiol Endocrinol Metab*. 2013;305:679-686.
- Parthasarathy S, Santanam N, Ramachandran S, Meilhac O. Oxidants and antioxidants in atherogenesis: an appraisal. *J Lipid Res*.1999;40:2143-2157.
- Frei B. Reactive oxygen species and antioxidant vitamins. *Linus Pauling Institute Oregon State University*.
- Chatterjee M, Saluja R, Kanneganti S. Biochemical and molecular evaluation of neutrophil NOS in spontaneously hypertensive rats. *Cell Mol Biol*. 2007; 53:84-93.
- Singh RP, Sharad S, Kapur S. Free radicals and oxidative stress in neurodegenerative diseases: Relevance of Dietary Antioxidants. *JIAACM*. 2004;5:218-225.

20. Walston J, Xue Q, Semba RD, Ferrucci L. Serum antioxidants, inflammation, and total mortality in older women. *Am J Epidemiol.* 2006;163:18-26.
21. Massicot F, Lamouri A, Martin C, Pham-Huy C. Preventive effects of two PAF-antagonists, PMS 536 and PMS 549, on cyclosporin-induced LLC-PK1 oxidative injury. *J Lipid Mediat Cell Signal.* 15:203-214.
22. Beatty S, Koh HH, Phil M, Henson D. The Role of oxidative stress in the pathogenesis of age-related macular degeneration. *Surv Ophthalmol.* 2004;45:115-134.
23. Myatt L. Placental adaptive responses and fetal programming. *J Physiol.* 2006;572:25-30.
24. Hracsko Z, Orvos H, Novak Z, Pal A, Varga IS. Evaluation of oxidative stress markers in neonates with intra-uterine growth retardation. *Redox Rep.* 2008;13:11-16.
25. Nguyen LA, He H, Pham-Huy C. Chiral drugs. An overview *Int J Biomed Sci.* 2006;2:85-100.
26. Seren S, Lieberman R, Bayraktar UD, Heath E. Lycopene in cancer prevention and treatment. Review *Am J Ther.* 2008;15:66-81.
27. Pham-Huy C, Nguyen P, Marchand V. Selenium and tobacco smoke tars: In vitro effects on different immunocompetent cells. *Toxicology.* 2001;164:111-112.
28. Hanneken A, Lin FF, Johnson J, Maher P. Flavonoids protect human retinal pigment epithelial cells from oxidative-stress-induced death. *Invest Ophthalmol Vis Sci.* 2006;47:3164-3177.