

Anti-Aging Potentials of Tocotrienol

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Abstract. Tocotrienols discovered in 1922 belong to the vitamin E family and exists in four isomeric forms as α -, β -, γ - and δ -tocotrienols. Since their discoveries they have been used in remedying various disease conditions, including aging. Early aging has been linked to skin cancer, Alzheimer and Parkinson diseases. Lifestyle and nutritional factors are mostly responsible for the above stated disorders. At present, there are special foods and dietary additives that are to the rescue of these diseases, especially early aging. The tocotrienols have been identified as an anti-aging agent and thus implicated in improving overall quality of life by reducing the incidences of these deleterious diseases and disorders. To control aging, tocotrienols rapidly penetrate through the skin and degrade at a great faster rate compared to the tocopherols and speed up wounds' healings and at the same time also improve the cosmetic skin insults, burns and wounds. They also protect and prevent against ultraviolet (UV)-induced skin damage and aging. Therefore, tocotrienols are 'ideal' dietary additives as well as supplements for anti-aging. Additionally, foods rich in tocotrienols have been researched and advocated for dealing with aging. This paper sheds more light on the potency of tocotrienols to control and thus prevent early aging.

Key words: Anti-aging, Vitamin E, Tocotrienols, Protection and Potencies

Introduction

Tocotrienols discovered in 1922 are naturally isoforms of vitamin E and occurring in the farnesylated unsaturated analogues of α -, β -, γ - and δ -Tocotrienols. Furthermore, the tocotrienols differ from the corresponding tocopherols in their aliphatic tail. On the other hand, tocopherols have a phytyl side chain attached to their chromanol nucleus while the tail of tocotrienols is unsaturated and forms an isoprenoid chain. Cereals such as corn, wheat and oilseed such as soybean are rich in tocopherols whereas barley, oats, palm and commercial rice brans contain more than 70% of tocotrienols often refer to as tocotrienol-rich fraction (TRF) (Yoshida, Niki & Noguchi, 2003). The literature is very rich with reports that the tocotrienols are very potent as antioxidants and thus can prevent cardiovascular diseases that often lead to unwarranted and sudden deaths (Yoshida, Niki & Noguchi, 2003). They are also very potent in their hypocholesterolemia activity that also results in improved health statuses, including improved blood circulation without much encumbrances (Qureshi et al., 2002). Furthermore, they also possess powerful neuro-protective, anticancer and cholesterol-lowering properties that are often not exhibited by tocopherols (Osakada et al., 2004; Ames, Gold & Willet, 1995). These special characteristics of tocotrienols make them to stand out as devout anti-aging nutrients.

Since the discoveries of the tocotrienols and their functions in relation to the aforementioned potencies and capabilities, researches into natural compounds rich in the tocotrienols have toyed an astronomical dimensions leading to many trials with tocotrienols with possible health-related benefits in respect to the prevention and therapy for different human health-derailments, including anti-early aging (Halliwell & Gutteridge, 1985). To this extent therefore, this paper is targeted to highlights the mechanisms and benefits of the tocotrienols as anti-aging agents as given below.

Tocotrienol as an Anti-Aging Agent

It has been postulated that aging is a complex process involving various random injurious damages leading to deterioration of tissues by free radicals normally produced during aerobic metabolism (Halliwell & Gutteridge, 1985). It has been documented that by increasing the status of the defenses of the animal, including humans against oxidative stress is in the core strategy of significantly reducing aging that readily comes with reduction in the overall quality of life of the animal, including humans. To this point therefore, the tocotrienols are demonstrated to be capable in regulating various mechanisms involved in the complex process of aging (Yoshida, Niki & Noguchi, 2003). Amongst all anti-oxidants' vitamins studied, vitamin E has been shown to be the primary and most potent lipid soluble antioxidant vitamin found in the skin (Yoshida, Niki & Noguchi, 2003; Osakada et al., 2004). To this extent therefore, vitamin E via its antioxidants statuses is capable of positively and beneficially modulating the various processes whose actions lead to many skin damages, including skin cancer (Osakada et al., 2004). It is known that antioxidants are the first-line of defense against free radicals produced in the skin by UV radiation and ozone invisible rays that are part of the energy that comes from the sun that is capable of inducing oxidative damage by burns on the skin and thus highly implicated in the onset of the pathogenesis of cancer of the skin. This is where tocotrienols come in handy. Tocotrienols are very potent in neutralizing free radicals at a very fast rate and in this way aid in preventing skin cancer that is known to trigger early-aging (Schaffer, Muller & Eckert, 2005). Here, it is imperative to state that tocotrienols rapidly penetrate through the skin and they are usually degraded at a great faster rate compared to the tocopherols (Schaffer, Muller & Eckert, 2005). In these ways, they speed up wounds' healings and at the same time also improve the cosmetic insults, burns and wounds that had been copiously implicated in hastening the aging process. It has been demonstrated by different independent studies that tocotrienols protect and prevent against UV-induced skin damage and aging (Thiele et al., 1997). Again, via these means they therefore function as sunscreens-protector of the skin; a fundamental mechanism in preventing skin cancer (Weber et al., 1997). It is also noteworthy to state that apart from tocotrienols potencies as antioxidants, they are also very potent as cardio-, neuro- and anti-cancer factors. From these standpoints, foods and nutraceuticals rich in tocotrienols are encouraged to be used as dietary supplements to protect the skin and promote good health. This view has been supported by some studies with implications for delaying early-aging (Al-Saqer et al., 2004). Therefore, dietary supplements rich in TRF have been vigorously advocated (Al-Saqer et al., 2004).

Conclusions

Tocotrienols are potent anti-aging agents compared to tocopherols. It is thus recommended that foods rich in tocotrienols as well as its supplements can be used to control and prevent early-aging in animals and humans.

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