Editorial

Antioxidants and Aging

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Aging is an extremely complex and multifactorial process. Numerous theories of aging have been proposed; the most important of these are probably the genomic and free radical theories. Other major theories are immune, neuroendocrine, somatic mutation, and error catastrophe. Although it is clear that our genes influence aging and longevity, exactly how this takes place on a chemical level is only partially understood. The genomic and free radical theories are closely linked. There are considerable indirect evidences supporting the free radical theory of aging.[1] With free radical activity damage to cells occurs, protein synthesis is impaired, proteins become cross-linked and tangled, tissues become less pliable, arteries incur damage leading to atherosclerosis, genetic material (DNA/RNA) is damaged with inefficient repair processes leading to possible cancer development. Age pigments also accumulate literally drowning the cells in lipofuscin, preventing them from functioning. Eventually all the signs and indications of aging are promoted, whether this is stiffness, poor circulation or wrinkles (cross-linkage). There are numerous natural protective mechanisms like the presence of superoxide dismutase, catalase, glutathione peroxidase, and glutathione reductase; various important intrinsic (uric acid, bilirubin, -SH proteins, glutathione, etc.) and extrinsic (vitamins C, E, carotenoids, flavonoids, etc.) antioxidants; and metal chelating proteins to prevent oxyradical-induced cellular damage. Argument against free radical theory is that while aging process is well-organized, free radical damage is more chaotic and random probably only responsible for the major diseases of old age. In their study Saxena R and Lal A.M. have shown significant alteration in antioxidant enzyme status and increased production of malondialdehyde with aging.[2] They have inferred that antioxidants could be beneficial in delaying the aging process. There can be very little doubt that antioxidants in the diet offer protection from many of the diseases and signs of aging, those which are caused by free radicals. There is, however, only limited evidence that antioxidants on their own have very much to offer towards actual life extension.

With the understanding of free radical activity various interventions for promotion of life extension have been suggested. Reduction in the diet of foods and substances which add to the free radical burden and dietary supplementation of free radical deactivators (antioxidants) such as vitamins A, C, E, and B6; minerals zinc and selenium; and amino acids cysteine, methionine and glutathione. Enzymes such as SOD and catalase are now known to survive the digestion process and to be able to increase tissue levels when supplemented in certain forms, such as freeze-dried wheat grass juice are also being recommended.

Reduction of caloric intake without malnutrition is one of the most consistent experimental interventions that increases mean and maximum life spans in different species. The beneficial effects of food restriction may be simply due to a decreased rate of both mitochondrial degradation and degenerative disease pathogenesis related to decreased levels of free radical reactions.

Anemia is the most common hematologic problem encountered in older adults. Though its prevalence increases with age particularly in women, anemia should not be accepted as an inevitable consequence of aging. The common causes of anemia among elderly are anemia of chronic disease, iron deficiency caused by gastrointestinal bleeding, cobalamin deficiency, folate deficiency and the myelodysplasia. In community studies iron deficiency anaemia outranks the anaemia of chronic disorders in prevalence, but the reverse is encountered in hospital practice The diagnosis of iron deficiency anemia (IDA) is important because proper iron therapy can improve the symptoms, and investigations may help in detecting an occult gastrointestinal pathology such as malignancy. Serum ferritin is the most useful test to differentiate iron deficiency anemia from anemia of chronic disease.

In the present issue a community survey from Chandigarh has revealed very high incidence of anemia

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in community dwelling elderly.[3] Though the haemoglobin estimation was done by Sahli's method, still it highlights the significant magnitude of the problem which can be corrected potentially to improve quality of life of our elderly population.

Candida species have been often considered but infrequently documented as a credible cause of diarrhea.[4] Candida species may cause diarrhea in selective clinical settings. Gambhir et al have documented candiada as a pathogen for diarrhea in elderly.[5] The mechanisms by which Candida species may induce diarrhea remain undefined. However, symptoms ascribed to Candida-associated diarrhea in the literature include prolonged secretory diarrhea with abdominal pain and cramping but without blood, mucus, fever, nausea, or vomiting. It commonly affects patients who are elderly, malnourished, and critically ill, or suffer from chronic debilitating illness. Stool culture most frequently isolated Candida albicans in association with decreased normal flora. Dramatic response to a short course of specific topical antifungal agents helps in establishing the diagnosis.[6]

Articular and non-articular conditions are a major cause of disability and discomfort in the elderly. These disorders determine the quality of life for older adults as the ability to live independently is hampered. Both inflammatory and degenerative arthritis, osteoporosis and diffuse pain syndromes are common in the elderly. Fortunately, the once nihilistic approach to arthritis in older people is now changing with newer therapeutic modalities and surgical options. Lehl et al have crisply reviewed the rheumatic diseases in elderly in the present issue.[7]

References

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