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# Significance of Preventive and Curative Aspect of Unani Medicine in Free Radicals Induced Lifestyle Disorders

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## Abstract

*The influence of lifestyle on human health is of worldwide increasing concern. Disease profile is changing rapidly. Currently, lifestyle disorders are becoming more problem, and policy makers are working on that. It draws major concern because it affects younger working community. Therefore, it would reduce the productivity of the entire nation. It is believed through various studies that free radicals are taking major part of the formation of lifestyle disorders. During the past several years, there has been a growing interest in the medical implications of free radicals. Free radicals can be formed from both, endogenous and exogenous substances due to unhealthy lifestyle. Free radicals cause lifestyle diseases such as cancer, cardiovascular diseases, arthritis, atherosclerosis, hypertension, etc. In recent years, a multitude of studies provide comprehensive evidence that increased production of reactive oxygen species are involved in the development and progression of lifestyle diseases. Hence, Unani system of medicine emphasizes on the maintenance of healthy life through implementing asbab-e-sitta zarooriya (six essential factors) in the life which influence on human body to generate a new state or maintain the persisting state and help in the promotion of health and prevention of disease. A balanced relationship between the six essential factors keeps the humors and the temperament on the right track and due to their imbalance, all mental and somatic diseases occur. Unani system not only addresses the symptoms of lifestyle diseases but also identifies and deals with the underlying causes. Hence, by adoption of an appropriate Unani lifestyle plan, free radical can be avoided or counteracted, and by that, prevent and reduce the degree and severity of the lifestyle diseases, thus ensuring a better quality of life.*

**Keywords:** Free radicals, lifestyle disorders, defense mechanism, Unani medicine

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## INTRODUCTION

Unani medicine emphasizes the equilibrium in all the aspects of the individual, including internal and external factors. When human being is synchronized with environment he remains healthy, and when there is any interruption in this synchronization, disorders occur. Thus, a disease associated with the way a person or group of people lives is known as lifestyle diseases. This includes obesity, cardiovascular diseases, diabetes, arthritis, spinal problems, carcinomas, etc. [1]. At present, lifestyle disorders are not only

affecting the elderly people, but also affecting the younger population.

The report released at the World health assembly in Geneva points to the fact that countries like Brazil, China, Russia and India currently lose more than 20 million productive life-years annually to chronic diseases. And the number is expected to grow by 65% by 2030 [2]. In recent years, a multitude of studies provide comprehensive evidence that increased production of reactive oxygen species are involved in the development and progression of

lifestyle diseases. Increased production of free radicals may be formed due to endogenous stress or exogenous sources of free radicals due to unhealthy lifestyle [3].

Unani system of medicine is one of the oldest systems of traditional medicines in the world which is popularly practiced in Indian sub continent and other parts of the world. Unani healing system employs a holistic approach to the prevention and treatment of disease. Prevention of disease is as much a concern of the system as curing of sickness. In Unani system, six essentials factors (*Asbab-e-Sitta-e-zaroriyah*) and where applicable, some non-essential factors (*Asbab-e-Gair Zarooriya*) have been laid down for the promotion of health and prevention of disease [4].

### WHAT IS FREE RADICAL?

A free radical may be defined as a molecule or molecular fragments containing one or more unpaired electrons in its outermost atomic or molecular orbital and are capable of independent existence [5]. The first demonstration of the chemical existence of free radicals has been the isolation of the nitroxyl radical in the form of Fremy's salt ( $(\text{KSO}_3)_2\text{NO}$  in 1845 [6]. Reactive oxygen species (ROS) and reactive nitrogen species (RNS) describe free radicals and other non-radical reactive derivatives such as HOCl (Hypochlorous acid), hydrogen peroxide, ozone, etc. [7].

The reactivity of radicals is generally stronger than non-radical species though radicals are less stable [8]. Free radicals are formed from molecules by the homolytic cleavage of a chemical bond and via redox reactions, once formed these highly reactive radicals can start a chain reaction [9].

ROS has been implicated in cell damage, necrosis and cell apoptosis due to its direct oxidizing effects on macromolecules such as lipids, proteins and DNA. Free radicals are however, not always harmful. They also serve useful purpose in the human body. Hence, complete elimination of these radicals would not only be impossible but also harmful [10].

The human body has several mechanisms to counteract free radicals by producing

antioxidants, which are either naturally produced *in situ*, or externally supplied through foods and/or supplements. When an overload of free radicals cannot gradually be destroyed, their accumulation in the body generates a phenomenon called oxidative stress. Oxidative stress occurs when either endogenously metabolic generated reactive molecules or exogenous reactive substances in the environment interact with biologic structures, resulting in altered cellular physiology [11]. This process plays a major part in the development of chronic and degenerative illness [8].

### Free Radicals and Lifestyle Disorders

Free radicals are produced either from normal cell metabolisms *in situ* or from external sources [8]. Most of the external sources and some of the endogenous generation of free radicals are due to lifestyle such as [3, 10, 11, 12]:

- Processed, overcooked, leftover foods,
- Sugar, and sugary foods,
- Stress,
- Excessive exercise,
- Alcohol,
- Extended sun exposure,
- Radiation,
- Medication,
- Smoking and passive smoke,
- Perfumes additives,
- Coffee,
- Foods of animal origin,
- Computers/Monitors/TVs,
- Foods that have been barbecued, broiled, fried, grilled, or otherwise cooked at high temperatures,
- Hydrogenated vegetable oils,
- Polluted air,
- Solvent-laden water,
- Pesticide-laced food and/or radiation exposure,
- Electromagnetic fields,
- Microwave ovens,
- Cell phones, and
- Refrigerators, etc.

Other sources of generation of free radicals are immune cell activation, inflammation, ischemia, infection, cancer, aging, etc. Recent studies provide comprehensive evidence on oxygen derived free radical reactions in the

pathogenesis of many lifestyle disorders such as cancer [10, 13], cardiovascular diseases [3, 13], arthritis [13], atherosclerosis [10, 14], hypertension [13, 15], diabetes [13], skin lesions [13], etc.

## DISEASE PREVENTION IN UNANI MEDICINE

The Unani system of medicine recognizes the influence of surroundings and ecological conditions on the state of health of human beings. The aim is to restore the equilibrium of various elements, humours and faculties of the human body [16]. Unani medicine employs a holistic approach on preventive and treatment aspects. As prevention is better than cure, it is as much a concern as treatment of an illness. This influence is based on the six essential prerequisites or *asbab-e sitta zarooriyah*. According to Unani medicine, "Asbab" is the precursor that influences on human body to generate a new state or maintain the persisting state and help in the promotion of health and prevention of disease. Six essential factors (*Asbab-e-Sitta Zarooriyah*) are [17–24]:

- Air: *Hawa-e-Muheet*
- Food and drinks: *Makoolat wa Mashroobat*
- Bodily movement and repose: *Harkat wa Sukoon-e-Badani*
- Psychic movement and repose: *Harkat wa Sukoon-e-Nafsani*
- Sleep and wakefulness: *NaumwaYaqza*
- Evacuation and retention: *Ehtibas wa Istifragh*

It has been mentioned that, these six factors essentially influence each and every one. A balanced relationship between the six essential factors keeps the humors and the temperament on the right track and due to their imbalance, all mental and somatic diseases occur. The correct application of these factors can lead to healthy life. Unani system of medicine also recognizes the influence of surroundings and ecological conditions on the state of health of human beings.

### The Unani Aspect of Prevention of Lifestyle Disorders

As per the concept of Unani medicine, the diseases occur due to poor management of six essential factors (*Asbab-e-Sitta Zarooriyah*) over long period. When there is improper

management of *Asbab-e-Sitta Zarooriyah*, toxins are accumulated in the body and *Tabi'at* (body physis- the supreme authoritative faculty of our body responsible to maintain health) fails to preserve the health if this is beyond the ability of the *tabi'at*. These toxins build up initially at the humoral level and lead to an accumulation of excess or abnormal humours. Finally, this accumulation of toxins adversely affects the various tissues and organs of the body, leading to structural damage and functional disturbances. Similarly, the free radicals are also generated due to unhealthy lifestyle and environmental conditions, leading to various lifestyle disorders. When they are in excess, body antioxidant defense system cannot cope and results in oxidative stress, a deleterious process that can seriously alter the cell membranes and other structures such as proteins, lipids, lipoproteins, and deoxyribonucleic acid (DNA), etc.

Therefore, in first instance accumulation of free radicals in the body should be prevented. In Unani literature, based on the six essential factors, there are number of preventive measures mentioned for the disease prevention and healthy life. Such measures can be applied invariably for the prevention of free radicals induced lifestyle diseases.

Air pollution is one of the causes of free radicals. Unani medicine emphasizes the necessity of unpolluted, clean air as the most necessary for health. Avicenna, the famous Arab physician, noted that the change of environment relieves the patients from many diseases. He also emphasized the need for open airy houses with proper ventilation [17].

In this era, due to urbanization and industrialization, air pollution is inevitable factor. However, there should be a collective effort by every individual to prevent air and environment pollution by changing the lifestyle and taking good care of the environment. To protect the air and environment, energy sources other than fossil fuel should be used as conserve energy. Food such as coffee, food of animal origin, alcohol, processed, overcooked, leftover food, solvent-laden water, etc. are the source of free radicals; it is recommended in Unani system that one should take the food

which is fresh, clean and free from putrefactions [18].

Unani medicine gives importance to food as medicine when it is used in the management of diseases. It is called *Ilaj bil ghiza* (dietotherapy), which is one of the four modalities of treatments mentioned in Unani such as *Ilaj bil dawa* (pharmacotherapy), *Ilaj bit tadbir* (regimental therapy) and *Ilaj bil yad* (surgery). Hence, during healthy condition as well as in diseased conditions certain types of food are recommended and certain food are prohibited on the basis of individual temperament (*Mizaj*) and the nature of the disease. In prevention of cardiac diseases, rice foods, vegetables, fruits like apple, pomegranate, pineapple, grapes, papaya, etc. are recommended and foods containing excess salt, egg yolk, liver, kidney, meat etc. are not recommended. This is supported by the evidence from a trial which demonstrated that subjects consuming high fruit and vegetable diets significantly reduced elevated blood pressure [19]. Recently, it has been confirmed that excessive accumulation of iron, common in meat eating populations, may be the most significant risk factor in the development of heart disease. This is probably due to this “transition metal” being a generator of free radicals [20]. We should eat a healthy high-fiber, low-fat diet with lots of freshly prepared yellow and green vegetables, fresh fruits, grains and beans.

Dirty water is considered as a carrier of several diseases. The Unani system, therefore, strongly emphasizes the need for keeping the water free from all sorts of impurities. Like food, different types of drinks are also mentioned in Unani system for the prevention and cure of some diseases. In cardiac diseases, alcohol, tea, salt, coffee, etc. are not recommended. Fruit juices and vegetable juices are recommended [18, 21, 22].

This is now a proved fact that fresh fruits and vegetables contain antioxidants prevent free radical damage. Many of the chemicals that generate free radicals are found in municipal water supplies. It is good to drink a lot of water, but to avoid tap water as much as possible. It is recommended to use a solid-carbon-block filtering device for drinking water from tap, well or spring water.

The modern day fashions for fitness have resulted in significant number of people dying with exertion of exercise to their hearts and lungs. It is a proven fact that regular physical exercise enhances the antioxidant defense system and protects against exercise induced free radical damage while endurance exercise can increase oxygen utilization from 10 to 20 times over the resting state [23]. This greatly increases the generation of free radicals, prompting concern about enhanced damage to muscles, and other tissues [3]. In Unani system of medicine not only exercises is considered necessary but also rest is considered necessary for maintaining good health. They also indicated that this keeps the heart and the liver in good condition [24, 25].

Now modern science is aware that the stress is one of the main risk factors for producing most of the lifestyle disease which are also responsible for free radicals. But Unani system documents extensively the impact on health of psychological factors such as happiness, sorrow, and anger etc. A balance between psychic movement and repose is emphasized for the prevention of diseases. Kabirruddin stated that, nervous excitement leads to several diseases, especially cardiac diseases. Further, he explained that the causes such as anxiety, mental tension, etc. increase the secretion of chemical substances that are responsible for the constriction of the blood vessels. This leads to hypertension, ischemic heart diseases, etc. [24].

Normal sleep and wakefulness are considered essential for good health in Unani system of medicine. Sleep provides physical and mental rest. The compounded sleep deprivation or sleep debt pushes metabolism into catabolism (excess free radicals formation, increase glycation reactions and cross-linked proteins, imbalances in apoptosis, accumulation of waste products, and failure of the repair systems and deficits of the immune system.) and melatonin is a very powerful anti-oxidant hormone which is produced during sleep [26]. Further, a theory of sleep is proposed in which cerebral free radicals accumulate during wakefulness and are removed during sleep. Removal of excess free radicals during sleep is accomplished by decreased rate of formation of free radicals, and increased efficiency of endogenous antioxidant mechanism [27]. According to Unani medicine,

proper and normal functioning of the excretory processes is necessary to keep good health [4]. If the waste products of the body are not completely excreted or when there is a disturbance or blockage, it leads to diseased state.

Free radicals are an example of toxic waste products that can seriously cause damage, if allowed to accumulate. But complete elimination of these radicals is also harmful [28]. Hence, not only evacuation but also retention of certain things also mentioned mandatory in Unani system for maintenance of health.

### Unani Aspect of Treatment of Lifestyle Disorders

The Unani treatment approach consists of reduction or elimination of abnormal/excess humours associated with the illness. This is done by adopting various regimens mentioned in Unani. *Munziji-Mushil* therapy (encouragement of the concoction and elimination of the abnormal humour), *Hijamah* (cupping therapy), *Irsal-e-alaq* (leech therapy), *Fasd* (venesection) are some of them. Beside this, strengthening the affected organ by giving *muqawwiyat* (tonics) such as *muqawwi-e-aam* (general body tonic), *muqawwi-e-meda* (tonic for the stomach), *muqawwi-e-jigar* (liver tonic), *muqawwi-e-dimagh* (brain tonic) etc. is important to eliminate the bad matters and bring the organ back to its optimum functional state [29–31].

In Unani system of medicine, the concept of tonics (*Muqawwiyat*) is a unique feature. Such drugs are used to tone up the important organs and strengthen them to save against the possible harmful substances. A large number of herbal drugs and dietary components are described as tonics in Unani system of medicine. Reactive oxygen species can be combated with the involvement of antioxidants of both exogenous and endogenous origin.

Anti-oxidants are substances capable to mop up free radicals and prevent them from causing cell damage. Research is increasingly showing that antioxidant rich foods and herbs reap health benefits. The herbal products today symbolize safety and are also compatible with human

normal physiology. Phyto-constituents present in them are also important source of antioxidants and are capable to terminate the free radical chain reactions.

The great Arabic physician Avicenna in his famous book *AdviaQalbia* has mentioned nearly sixty three drugs as cardiac tonics such as, *Bombyxmori*, *Emblica officinalis*, *Citrus medica*, *Punicagranatum*, *Parmeliaperlata*, *Helianthus annuus*, *Myrtuscommunis*, *Melissa officinalis*, *Tamarindusindicus*, *Rheum emodi*, *Crocus sativa*, *Santalumalba*, *Boswelliaglabra*, etc. Recent studies carried out on these drugs have proved that these are having antioxidant potential which is the main treatment option for the modern day free radical induced damage [32].

### CONCLUSION

Present world lives with drastic changes in the life style. Consequently, increased number of subjects are at risk of lifestyle diseases and there is a high occurrence of evidence for the direct relationship between oxidative stress and these diseases.

Human body has an ability to produce some antioxidants like superoxide dismutase, catalase and glutathione peroxidase for the protection against free radicals; according to Unani, this is part of the function of *tabi'at*. But due to unhealthy lifestyle, there is imbalance between the free radical production and *tabi'at* or body defense system. From the modern medical system, although there is a welcome move towards educating the patient on the importance of lifestyle changes, treatment is still predominantly based upon the use of medication.

Unani system not only addresses the symptoms of lifestyle diseases but also identifies and deals with the underlying causes. This is further strengthened by temperamental/humoral theory which gives a broad idea on risk factors and treatment options for the effective management of lifestyle diseases. Therefore, by adoption of an appropriate lifestyle plan according to Unani system of medicine, it is possible to avoid or counteract free radicals. Thus lifestyle disorders can be prevented or severity of the disease can be reduced to ensure a better quality of life.

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