Nutraceuticals: Ayurveda’s Perspective

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Abstract
Nutraceuticals are natural bioactive materials that provide demonstrated physiological benefits or reduce the risk of chronic diseases, above and beyond their basic nutritional function. Consumers’ demand for quality of life has fueled the ‘nutraceutical revolution’ and seeking complementary or alternative beneficial products. The association of nutraceuticals with traditional medicine brings the long-standing consumer acceptance. Although the concept of nutraceuticals is gaining more popularity more recently, its roots can be traced to the ancient Indian system of medicine, ‘Ayurveda’. It is clearly stated that food, which besides providing nutrition helps to maintain the healthy state and prevents the occurrence of diseases should be consumed. The classical texts of Ayurveda are filled with scattered references of implication of food products in various disease entities. The concept of ‘Aajasrik Rasayana’ (general rejuvenation) deals with food products that can be consumed daily for improving quality of life by offering protection from external and internal stressors. Commonly used nutraceuticals of Ayurveda include Chyavanprash (for general health and prevention of respiratory disorders); Brahma Rasayana (for protection from mental stress); Phala Ghrita (for reproductive health); Arjuna Ksheerpaka (for cardioprotection); Shatavari Ghrita (for general health of women during various physiological states) and Rasona Ksheerpaka (for cardioprotection). Implication of certain nutraceuticals mentioned in various conditions and their merits will be elaborately discussed in this paper.

INTRODUCTION

“Let food be thy medicine and medicine be thy food.”
(Hippocrates 400 BC)

Man has eternally endeavored to keep himself free from all types of miseries, efforts being for the purpose of prevention as well as cure of diseases. Evidences of implication of foods for providing particular benefits are found since antiquity. The ancient Greeks considered garlic as a performance-enhancing drug and officially used it for this purpose during the first Olympic games. During 16th century, sailors were given lemon to prevent and treat scurvy.

More recent revelations about the side effects of synthetic drugs and chemotherapeutics employed due to the increase in the occurrence of diseases as diabetes, cancer and heart problems have alerted many people all over the world and efforts are on the rise to find alternatives. The stand that food can be health promoting beyond its traditional nutritional value is gaining momentum amongst scientists, health professionals as well as consumers. Other factors, which have brought about this revolutionary approach towards food include: an overall increase in the aging population; escalating costs of preventive and curative medicines; practice of self medication and repeat purchases by consumers themselves; increased awareness among general public regarding health and search for safer and natural alternatives and growing scientific evidence regarding beneficial effects of diet in limiting the propagation of diseases.

All these factors and economic growth in recent years have strengthened the
interest in diet and nutraceuticals. Functional foods and nutraceuticals have obtained a middle ground between food and drug due to recognition of their role in health. Recent findings have established a strong link between consumption of whole grains and reduced risk of coronary heart disease (Lui, 2002); foods rich in natural soluble fiber as psyllium with reduced incidence of coronary heart disease (Anderson, 1995); fruits and vegetables and decreased risk for cancer (Steinmetz and Potter, 1996); garlic and n-3 fatty acids and reduction in elevated serum cholesterol levels (Von Schacky et al., 2001); lycopene and reduced cancer rates (Livny et al., 2002); black and green tea with cancer prevention and control (Das et al., 2002), and fermented dairy products and improved gastro-intestinal health (Marteau et al., 2001). Additionally, efforts have been made to identify the plant species and their specific uses in ancient Asian cultures and integrate the traditional medical wisdom with demonstrated medicinal properties in controlled experiments (Palaniswamy, 2003).

**NUTRACEUTICALS AND AYURVEDA**

In Ayurveda, the importance of particular diet in prevention and treatment of diseases was well known even in 1000 BC. For ages, people in India, because of their cultural beliefs and experiences have taken herbs and herbal formulations as part of their daily food supplements. The faith in the power of botanicals along with the availability of a vast majority of different kinds of herbs in India has always been a thrust behind the survival of this scientific art of healing.

> **“Tat cha nityam prayanjeet svasthyam yen anuvartate.** 
> **Ajaatanam vikaranam anuttpattikaram cha yat.”**
>  
> (Charaka Samhita: Sutra Sthana: 5)

(The diet which besides providing the basic nutrition to the body, helps to maintain the healthy state of the body and prevents the occurrence of diseases should be consumed).

An interesting verse regarding the importance of wholesome diet goes as:

> **“Pathye sati gadaartasya kim aushadh nishevane.** 
> **Pathye asati gadaartasya kim aushadh nishevane.”**
>  
> (Vaidhya Jeevana: 1/10)

(If wholesome diet is given in a planned way, then there is no need to administer medicines and if wholesome diet is not being used then too there is no need to give medicine, as this is not going to cure the disease in the absence of wholesome diet).

The science of food and nutritionals in Ayurveda was so developed that Charaka (an Ayurvedic Scholar) has categorized all the food items into twelve classes: corns with bristles, pulses or legumes, meat, leafy vegetables, fruit, vegetables which are consumed raw, wines, water from different sources, milk and milk products, products of sugarcane, food preparations, and accessory food items such as oils and salts, and has further subcategorized these food groups. Another classification is based on the consistency of food products: Peeta (liquid in consistency, advisable for the newborns, children and diseased people and advocated in summer), Leeda (Paste form that can be licked, advisable for children, convalescing and old people), Ashita (Semi solids, advised for aged people) and Khadita (solid food, advisable for young people with good digestion).

It is interesting to learn that Ayurveda lays a great emphasis on the quality of nutritious food for (i) averting the degenerative changes caused by ageing (Rasayana), (ii) convalescence after an illness (Balya), (iii) enhancing the defense system (Roga Pratibandhaka Rasayana), (iv) maintaining the vigor and vitality (Vajikarana), and (v) for
maintaining the joie-de-vivre (Jeevaniya). The category of Rasayana drugs is divided into three categories, Kamya (for vitality, intellect etc.), Naimmitika (for specific disorders) and Aajasrika (general), the last one dealing with the daily consumption of specific food products to rejuvenate the body. These food products are said to improve the quality of life by offering protection from internal and external stressors. The usage of nutraceuticals as advocated by Ayurveda can be also classified depending upon the age of the individual, season of consumption, time of consumption, physiological conditions and according to the target organ.

Ayurveda states that sound health depends on three biological forces named as Vata, Pitta and Kapha, which are all pervading and in their state of equilibrium, are responsible for healthy structural and functional setup. Although different levels of their predominance are said to determine different types of physical disposition (called Prakruti), age wise also, their levels tend to vary. In brief, while the predominant Kapha in childhood promotes growth and development by supporting the anabolic activities, Pitta in adults maintains a higher metabolic rate and ensures increased productivity/performance, whereas the increased Vata in old age leads to elevated catabolism, wear and tear and ushers us to degenerative changes. For this precise reason, it is important to take these factors in consideration while advocating any nutraceutical. For example paste of Indian Pennywort (Bacopa monniera) and Sweet flag (Acorus calamus) along with honey is given to the new born to pacify the increased Kapha Dosha and to improve the memory of the child. All the Rasayana and Vajikarana formulations are advocated in the young age while Chyawanprash is a Rasayana for old aged as well.

Another important aspect enumerated by Ayurveda pertains to the influence of environmental factors on the physiological factors. The external stressors in the form of environmental factors tend to have an impact on the three biological factors. To neutralize these impacts, some recommendations are made. A unique nutraceutical based on seasonal variations is ‘Ritu Haritaki’ i.e. use of fruit of Chebulic myrobalans (Terminalia chebula) as per the season. The fruit should be used along with rock salt (Saindhava) in rainy season, with sugar in autumn, with dried rhizome of Ginger (Zingiber officinale) in early winters, with fruit powder of long pepper (Piper longum) in late winters, with honey in spring and with jaggery in summer season. Another example of use of nutraceuticals as per season is of Bhallataka Rasayana (preparation of fruits of Semecarpus anacardium), which should not be consumed in summer season.

Third category pertains to use depending on the time of consumption. Most of the Rasayanas have been advised to consume in the early hours of the day. Use of ginger mixed with rock salt before meals is advocated to enhance the appetite and aid digestion. Another example is of Triphala Rasayana according to which fruit of Chebulic myrobalans are to be consumed after the digestion of previous meal, of Beleric myrobalans (Terminalia bellerica) before taking food and of Indian Gooseberry (Emblica officinalis) after taking meal.

Another class of nutraceuticals belongs to those formulations that have been conceived to offer specific benefits in certain physiological conditions. Use of Satavari Ghrita (a formulation of Asparagus racemosus with clarified butter) is advocated in lactating women to improve lactation. Use of Dashamoola Ghrita (Dashamoola is a group of ten drugs whose roots are used) after child delivery is advocated to facilitate the involution of uterus to its normal state.

Another approach adopted by Ayurveda is organ or body system oriented wherein use is aimed at delivering benefits to a particular organ. Chyawanprash is aimed to give strength to the respiratory system. Pippali Rasayana (use of fruit of long pepper with honey) is also advocated to confer immunity to the respiratory system. Use of Triphala powder (powder of fruits of chebulic myrobalans, beleric myrobalans and Indian gooseberry) along with honey and clarified butter is advocated for maintaining/improving the eyesight.

A confection of Indian Gooseberry is used in households of India during winter season to prevent rhinitis and respiratory tract infections. A confection of rose petals and
sugar is employed as mild laxative for children and as cooling agent, which subdues the vitiation of Pitta Dosha. Ardraka paka (ginger based confection toffee) is one such preparation, which is made up of ginger, sugar, salt and lemon and is used as an aid to digestion. Confection of Bael fruit (Aegle marmelos) is used in the household for the problems of gastrointestinal tract. Paste of Mentha leaves (Mentha arvensis) is consumed along with meals for preventing abdominal distension. Consumption of grated garlic, fresh ginger and fresh turmeric rhizome mixed with lemon and salt is used as an aid to digestion. Further certain sugar based confections and herb treated clarified butter (ghee) preparations are also used in India as home-remedial nutraceuticals. In this class, commonly used combinations include Chyawanprash, Brahmi Rasayana, Phala Ghrita, Arjuna Ksheerapaka and Rasona Ksheerapaka.

Chyawanprash Avaleha

This is a sugar and honey based confection of over 50 herbs, sesame oil and clarified butter traditionally used for ailments of respiratory tract. The main ingredient of this formulation is Indian Gooseberry, which is a rich source of Vitamin C, found to possess anti-oxidant activities (Bhattacharya et al., 2002); immunomodulatory and cytoprotective activities (Sairam et al., 2002); hypolipidemic activity (Mathur et al., 1996) and hepatoprotective activity (Bhattacharya et al., 2000a). Chyawanprash exhibited hepato-protective effect in studies (Jose and Kuttan, 2000) and reduced postprandial glycemia and blood cholesterol levels (Manjunatha et al., 2001).

Brahmi Rasayana

This is used for combating the day-to-day mental stress, improving memory and higher order cognitive functions. As per Ayurveda, man is a combination of body, soul and psyche and for being in a healthy state, health of body as well as psyche should be ensured. In the present formulation, meant for this purpose, Indian pennywort is processed with paste of few other herbs and clarified butter. As per Ayurveda, Brahmi is a Medhya Rasayana (memory enhancer) whose exact mode of action as a brain tonic has not yet been identified. It exhibited anti-oxidant effect (Bhattacharya et al., 2000b; Pawar et al., 2001); increased GABA levels in the brain (Dey and Dutta, 1966) and offered tranquilizing effect (Ganguly and Malhotra, 1967).

Arjuna Ksheerapaka

The word Ksheerapaka means processed milk. This is a preparation of bark of the srijun tree (Terminalia arjuna), processed with milk. The main effect offered by Arjuna is of cardio-protection, which is supported by many scientific studies. In a study of cases of chronic stable angina, this led to improvement in clinical and treadmill exercise parameters comparable to the standard isosorbide mononitrate therapy (Bharani et al., 2002); offered protection against the damage induced by myocardial necrosis (Sumitra et al., 2001); exhibited anti-oxidant activity (Munasinghe et al., 2001); anti-oxidant and hypocholesterolemic effect in cases of coronary heart disease (Shaila et al., 1998); improved left ventricular ejection fraction (LVEF) in cases of coronary artery disease (Dwivedi and Jauhari, 1997).

Rasona Ksheerapaka

In this formulation de-husked and dried bulbils of garlic are processed with eight times milk. Garlic (Allium sativum) is a Rasayana drug in Ayurveda. Present formulation is said to be useful in ailments of Vata Dosha (e.g. sciatica, arthritis, cardiac disorders), although, the main use of this formulation by physicians is in hyperlipidemia. Retardative effect on development of atherosclerosis (Mirahadi et al., 1991), relaxant effect on aortic rings in vitro (Aquel et al., 1991), and anti-arrhythmic effect in both ventricular and supra ventricular arrhythmias (Martin et al., 1994) have been reported.
Phala Ghrita

This formulation is a combination of around 30 herbs including chebulic myrobalans, Indian gooseberry, belleric myrobalans, long pepper, turmeric and sandal, processed with clarified butter and cow’s milk. It is advocated in men and women for reproductive health, nowadays mainly used in females for primary and secondary infertility. The name Phala Ghrita is a symbolic representation of the activities attributed to this formulation. The word ‘Phala’ means fruit, which is a product of fertilization.

| CONCLUSION |

The association of nutraceuticals with traditional medicine is bound to bring the long lasting consumer acceptance. When supported by current modern medical research, the acceptance is whole hearted. The examples quoted above are of the few nutraceutical preparations picked in their original form from the classical texts of Ayurveda in which fortification in terms of desired effects has been done in a natural way. It is not always possible to find out the active phyto-constituent and the rationality of a particular combination of herbs in terms of modern scientific methods. But all that which is beyond the reach of scientific proof is not irrational and non-existing, as rightly depicted by Aacharya Charaka (one of the earliest Ayurvedic scholars) – “Pratyakshama hi alpam, analpam apratyakshama” (i.e. what is visible to human beings is only a small fraction of this universe and what we can not perceive is much more than that, which doesn’t make that non-existent). The formulations cited above are in use for centuries and have survived due to the benefits that they offer.

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