

SHIFT FROM PHARMACEUTICALS TO NUTRACEUTICALS : AN EMERGING TREND IN HEALTH CARE SECTOR

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ABSTRACT:

Awareness among the people regarding health and wellness is shifting the trend towards "Prevention is better than cure", thus resulting into an inclination towards the nutraceuticals, functional foods and dietary supplements. Nutraceuticals- a term coined by Dr Stephen De Flice are foods with therapeutic potential. Nutraceuticals have received a lot of interest in the recent past because of their nutritional and pharmaceutical potential along with presumed safety. These are helpful to combat various life style disorders and other health problems. In the last ten years an explosive growth in the multi billion dollar nutraceutical industry has been witnessed. Nutraceutical market is expected to reach USD 578.23 Billion by 2025 with CAGR 8.8%. Although there are several evidence in support of role of nutraceuticals in health care and well being, yet a plenty of efforts are still required to fully explore their therapeutic potential. Accessibility and consumer safety are issues of major concern and needed to be addressed. This review is an effort to summarize the nutraceuticals, their role in health care and future prospects of nutraceutical industry. A paradigm shift from pharmaceuticals to nutraceuticals with a prophylactic approach is evident. Preventive health care seems to be the best option keeping in mind various life style diseases and rising health care costs.

KEY WORDS: *Dietary supplements, Functional foods, Health care, Nutraceuticals, Pharmaceuticals.*

1.INTRODUCTION:

Nutritive food plays a pivotal role in maintenance of health as well as in keeping several ailments at bay. In the recent past, a major shift in global health and wellness industry from treatment to prevention of the ailment has been observed. 'Let food be thy medicine' as quoted by famous Greek physician Hippocrates, father of Medicine seems appropriate in this emerging era of nutraceuticals, dietary supplements and functional foods [1,2,3]. Nutritional therapy is a healing system using dietary therapeutics or nutraceuticals as complementary therapy. This therapy is based on the belief that foods can not only be sources of nutrients and energy, but could also provide medicinal benefits. According to nutraceutical and nutritional therapy theory, it achieves this goal by using efficacy of such nutraceuticals in detoxifying the body, avoiding vitamins and mineral deficiency and restoring healthy digestion and dietary habit[4,5]. Phytochemicals basically is a plant nutrient with particular biological activities in supporting health [6]. Plants have been used by mankind since times immemorial. Chinese, Egyptians recognized the medicinal use of Coriander, Fennel, Garlic, Juniper,

Turmeric and mint etc found in pyramids. Their significant role can be judged from the fact that cinnamon was considered more precious than gold in Egypt during earlier times. Roman emperor Heliogabalus used cinnamon, clove and pepper in various cuisines. Globally 50-80 thousand plant species are used either naturally or as pharmaceutical derivatives for various health related issues. Untapped plant wealth is perspective target for drug and food multinationals and research industry for novel drugs, potential nutraceuticals and functional foods [7,8]. Use of nutraceuticals, functional foods has lowered the dependency on drugs. Term Nutraceutical refers to food having medicinal effect on human health. It consists of food supplements, herbal products, probiotics and prebiotics meant for prevention and treatment of diseases [9]. Most of nutraceuticals possess multiple therapeutic effects. Nutraceuticals have proven health benefits and their consumption within their acceptable recommended dietary intake will keep human beings healthy and disease free. Term Nutraceutical was coined by Stephan De Felice MD, founder and chairman of the foundation for innovation in Medicine (FIM) Cranford, New Jersey [10,11]. According to De Flice Nutraceuticals are food or part of a food that provide medicinal and health benefits including prevention and /or treatment of disease [12]. According to Dietary Supplement Health and Education Act (DHEA), Dietary supplements are products intended to supplement the diet that bears or contains one or more of the following dietary ingredients – a vitamin, mineral, amino acid, herb, botanical, dietary substance for use by man to supplement the diet by increasing total daily intake or concentrate, extract or combination of these ingredients [13]. It may be taken in the form of a pill, tablet, capsule or powder. Functional foods are ordinary food that have components, ingredients that are incorporated into gives them a specific medicinal or health benefit, moreover a nutritional effect [14]. Nutraceuticals are medicinal foods that are mainly recommended for maintenance of healthy state of well being and prevention of number of acute and chronic diseases. Nutraceuticals are not traditionally recognized nutrients but have number of physiological effects on human body. Nutraceuticals may be used to improve health, delay aging process, prevent chronic diseases, increase life expectancy or support structure and functioning of body. Recent studies have shown several evidence in support of role played by nutraceuticals and functional foods. Nutraceuticals have received considerable interest in recent past because of their presumed safety and potential nutritional and pharmaceutical value. There is more stress on prevention and better management of diseases. A paradigm shift from pharmaceuticals to nutraceuticals is indicating the emergence of a new era in health care sector. [15,16]

The present review explores the role of nutraceuticals in human health, disease prevention, health promotion and as an adjunct to disease treatment and nutraceutical market trends.

2.CLASSIFICATION OF NUTRACEUTICALS:

Nutraceuticals hold a great promise to improve health and prevention of various ailments. These are classified into different categories as Nutrients, Dietary supplements, functional foods, Pro biotics and Prebiotics, Phytochemicals, antioxidants, ,herbals etc [17,18][Fig.1].

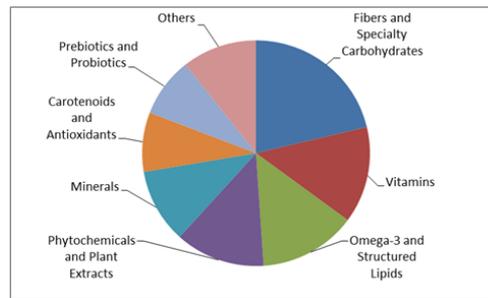


FIG.1: Different categories of Nutraceuticals

2.1 MICROBIAL NUTRACEUTICALS:

Several micro organisms such as bacteria, yeast possess nutraceutical properties. Probiotics are live micro organisms conferring a positive impact on health when consumed in adequate quantities and have numerous benefits as nutraceuticals. These help to lower cholesterol and Blood pressure, improve immune system, reduce inflammation, improve digestion, and absorption of food, preventing growth of harmful bacteria. Probiotics are microbial food ingredients with a beneficiary role. These help to promote healthy digestion and absorption of nutrients[19]. Anti microbial activity is by modification of microflora, competing for nutrient requirement necessary for survival and multiplication of pathogen, prevention of adhesion of pathogens to intestinal wall and antagonizing the effects of some harmful microflora. A variety of bacteria possess probiotic properties are *Lactobacillus*, *Bifidobacterium*, *Streptococcus*, *Enterococcus*, *Bacillus* and *Pediococcus* etc [20].

2.2 PHYTOCHEMICALS AS NUTRACEUTICALS:

Phytochemicals have aroused the interest of research fraternity in to their potential role in upliftment of health. Phytochemicals are non-nutrient, bioactive compounds of plant origin. These are naturally occurring bi active compounds providing colour, flavor, texture and other peculiar characteristics to the plants [21]. Lycopenes in tomato, Carotene in carrots, Saponins in soy, Capsaicin in chillies, Catechins in tea, lignin in flax seeds, limonoids in citrus fruits and glucosinolates are some of the examples of phytochemicals with therapeutic role as nutraceuticals. These are exploited for their anti oxidant, anti inflammatory, anti carcinogenic and immunomodulatory properties. These alone or in some combined form are of immense therapeutic potential [22]. Various phytochemicals present in food are used as nutraceuticals for the cure as well as prevention of a variety of acute and chronic diseases [23,24].

3.STATUS OF NUTRACEUTICALS IN HEALTH SECTOR :

Nutraceuticals have emerged as beneficial health products showing efficacy in dealing with number of health problems. Extensive researches have revealed the role of nutraceuticals in prevention and management of various diseases like Coronary heart diseases, Hypertension, Cancer, Osteoporosis, Diabetes, Obesity, Arthritis and gastro intestinal disorders etc [25-29]. [Fig.2].

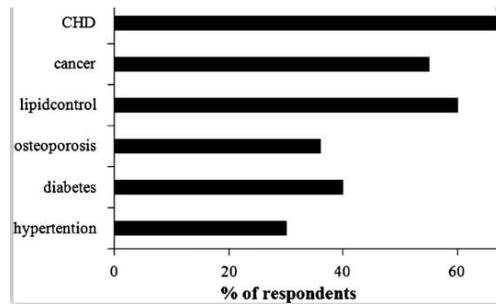


FIG.2: Showing percentage of respondents suffering from various ailments to Nutraceuticals.

Growing interest of health professionals, nutritionists, and researchers in the field of nutraceutical development has resulted into an industry with tremendous scope in future and is showing exponential growth. In 2016, global market for nutraceuticals was USD 272.35 billion. Major share in the global nutraceutical market is held by United States (37%) and Europe (33%).

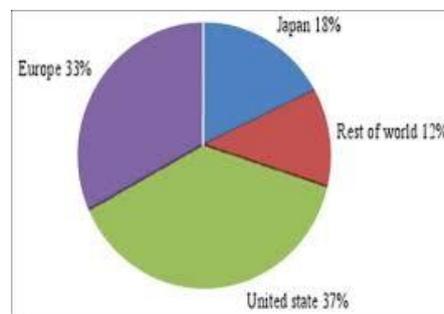


FIG.3: Global Nutraceutical Market Share of different nations.

Among the Asian countries Japan holds the largest share (18%)[Fig.3]. Though in India , nutraceutical industry is still at infancy, yet it is showing a promising drift towards nutraceuticals, also known as Fast moving Health Goods. Indian nutraceutical market has shown an annual growth rate of 20% for the past three years, thus contributing 2% of the global market. Indian nutraceutical market has reached around US\$2 Billion [30, 31]. Several challenges are associated with nutraceutical marketing. High price and lack of awareness among the masses are still felt as major challenges to cope with the issue [FIG.4]. Apart from it safety issues are also of major concern.

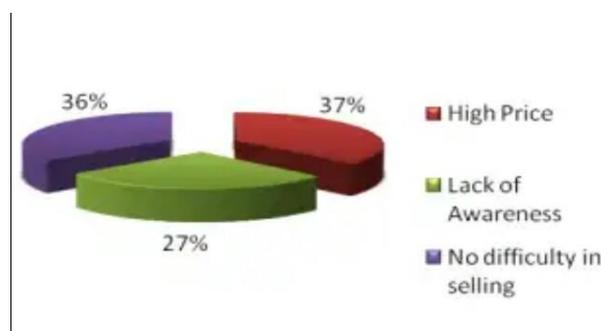


FIG. 4: Various challenges in nutraceutical marketing

4. NUTRACEUTICAL REGULATIONS:

Along with availability and accessibility of food, safety of food is also of the utmost importance. Regulation of food safety is aimed at harmonization of well being, protection of human health, fair trade of food within and between different nations, economic growth etc. Various regulatory acts have been framed to ensure quality and efficacy of nutraceuticals [Fig.5].in India, food sector is governed by multiple laws enacted at different levels to complement and supplement each other [32]. In 2006, Indian Govt passed Food Safety and Standard Act to regulate the nutraceutical industry.

Country	Regulatory act	Regulatory issues
Japan	FOSHU(Food for specified health use),1991	Focuses on health claims for specific products
	Food with Health Claims (FHC),2001	Category of products expanded to include capsules and tablets
	Foods with Nutrient Function Claims* (FNFC),2005	Restricted to the specified nutrients having nutritional function claims in FHC
China	State Food and Drug Administration of China (SFDA), 2003	Oversees and coordinate the health, food, and drug agencies
	SFDA (State Food and Drug Administration),2005	Guideline of registration for functional foods was promulgated
	State Council Legislative Office (SCLO),2009	Regulates foods that have a functional or health claim associated with their use
India	The Food Safety and Standard Act (FSSA), 2006	Manufacture, sell or import of novel foods, GMF, irradiated food, organic food, and food for special dietary uses, functional food, nutraceuticals and health supplements
	The Food Safety and Standard Authority of India (FSSAI), 2008	Single reference point for all matters relating to food safety and standards
	Food Safety and Standards Rules and Regulations, 2009	More emphasis on science based and participatory decisions
	The Food Safety and Standard Authority of India (FSSAI), 2010	implemented

FIG.5: Regulatory Acts passed by various Asian Countries.

Regulatory uncertainty and credibility of labeling claims are two major challenges faced by nutraceutical industry. Implementation of regulatory body is necessary for standardization of nutraceutical industry [33-38].

5. FUTURE PROSPECTS:

Nutraceuticals are products formed as a result of combined efforts of food, pharmaceutical and chemical industries. Botanical dietary supplement segment is anticipated to witness considerable growth over the forecast period of five years on account of increasing risk of various life style ailments like obesity, hypertension, diabetes etc. Rapidly expanding nutraceutical market is indicating the emergence of a new era in health and wellness industry [Fig. 6].

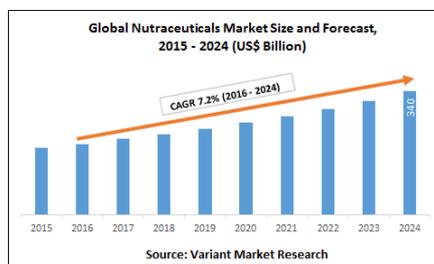


FIG.6: Growing Trend in Global Nutraceutical Market

Inclination from Pharmaceuticals to nutraceuticals indicates the shifting trend in health care sector. Tremendous growth in nutraceutical industry has implications for food, pharmaceutical and agriculture sector[39,40].

According to a latest research report by Grand View Research, nutraceutical market is projected to reach worth USD 578.23 Billion with CAGR of 8.8% by 2025.

6.CONCLUSION:

Nutraceuticals are quickly replacing pharmaceuticals in prevention and management of acute and chronic health problems. Nutraceuticals show an ample scope to flourish in future as therapeutic agents with preventive and curative properties. Although nutraceuticals show a promising approach for the promotion of health and prevention of various diseases, yet health professionals, nutritionists, toxicologists should strategically work in collaboration to explore them for their full potential [41,42]. A ray of cure preference in the mind of common patients revolve around nutraceuticals because of their false perception "All natural medicines are good". Also a high cost of prescription pharmaceuticals and reluctance of some insurance companies to cover the cost of drugs help the nutraceuticals to solidify their presence in the global market of therapies and therapeutic agents.

Use of nutraceuticals as an attempt to explore their therapeutic potential with minimum side effects as compared to conventional pharmaceuticals has observed a great success and met with huge monetary benefits[43,44]. The preference for exploration and production of nutraceuticals over pharmaceuticals is evident in various pharmaceutical and biotechnology companies [45]. Nutraceuticals still need extensive scientific research to prove their preference over pharmaceuticals. It can be achieved by enactment of FIM Proposed Nutraceutical Research and Education Act (NREA). It includes creation of a Nutraceutical Commission (NUCOM) specifically for the review and approval of nutraceuticals as well as clinical research. As per FIM, NREA should look into exclusive rights over the research and development[46]. Cost wise of nutraceuticals should be kept with in the accessibility of common man. There is an imperative need to focus on the establishments of new horizons in nutraceutical development.

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