Bhartiya Aahar Sampoorn Swasthya Ke Liye, Indian Diet for Integral Health

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1. INTRODUCTION

Traditional Diets and Transition to Modernity

The history of dietary prescriptions dates back, perhaps to the origin of the human race. Modern Nutrition has undergone an epidemiologic shift and a significant transition in dietary preferences and practices over the last few decades, more so in India.

Diet has played an important role in both preventive and therapeutic medicine and traditional Indian medicine has always laid emphasis on physiologic individuality and also on culinary and prescriptive remedies with reference to food, what to eat and what not to eat across various times of the day, seasons, geography, physiological and psychosomatic states. (Kochhar 1996, Alves 2007, Kochhar 2008 a,b). Nature endowed genetic profile versus nurture induced epigenetic modifications debate has also been revisited and come full circle from integrative systems physiology through the various 'omics' to again nutritional systems biology traversing proteomics, metabolomics, adipo biology, gut microbiomics, geronto biology. From periimplantation, through fetal, natal, paediatric, adulthood, aging to trangenerational via various physiologic epiphenomena, imprinting, bio rhythms oscillations, metabiolic and neuronal programming and malprogramming, mitochondrial function and dysfunction and chromosomal changes or silencing of DNA expression damage can affect our epiphenolype and carry it forward. What our maternal grandparents ate, where they lived can all influence our health and disease profile. Extensive research within the last few decades from our laboratory and others has indicated that phytochemicals and dietary additives including spices and herbs in traditional Indian diet and Indian lifestyle practices may prevent various chronic metabolic and degeneratives illnesses including cancerous, diabetic, cardiovascular, pulmonary, gastrointestinal, neurological, dermatological and autoimmune diseases.

2. DIETARY SPICES

Kitchen to Pharmacy to Nanotechnology

Herbs, condiments and spices have been used since ancient times by physicians and laymen to treat a great variety of human diseases, yet many of them need to pass tests of modern, controlled, clinical experimentation. India with its wide climatic conditions and topographical features is perhaps unrivalled in the world and a wide variety of species of herbs can ever be grown with ease. With these factors, naturally the Indian medicinal flora is one of the richest and cosmopolitan one with high therapeutic potentialities. By diligent efforts it is possible to utilize the herbal health, for the utmost advantage of a common man. Both empirical and experimental observations strongly indicate that the effects of spices extend beyond taste and flavour. A critical prediction of the antimicrobial hypothesis is that spice use yields a health benefit; cleansing food of parasites and pathogens before it is eaten.

Dietary spice maintain human health by their antioxidative, chemopreventive, antimutagenic, antiinflammatory, immune modulatory effects on cells and a wide ranging array of putative beneficial effects on human health via action on gastrointestinal, cardiovascular, respiratory, metabolic, reproductive, neural and other systems.

Dietary spices may influence not only gastric emptying and gastrointestinal motility but also secretion of gastric acid as well as intestinal, bicarbonate, bilopancreatic secretions and also absorptive processes and bacterial microflora. Local effects on gut mucosa, gastrointestinal reflexes and enteric nervous as well as systemic autonomic responses influence uptake and metabolism of cardinal spice principles and also spices in turn affect carbohydrate, protein and fat absorption in diverse ways and exert several beneficial physiological effects including the antidiabetic influence via short term hypoglycemia and long term improved glucose tolerance. High homeostatic model assessment (HOMA) value indicated that administration spice mixture improved glucose metabolism and ingestion reduced total plasma glucose response and corrected insulin resistance possibly through

improved insulin-sensitizing actions of the active spice constituents.

Several active ingredients of spices including capsaicin (red pepper) piperine (black pepper), curcumin (turmeric), eugenic acid (clove), ferulic acid (turmeric) and myristic acid (mace amla) have been reported to influence lipid metabolism predominantly by mobilization of fatty acids. Curcumin and capsaicin altered bile salt secretion to make it less lithogenic and also lowered cholesterol levels. Garlic and turmeric are potent vasorelaxants as well as reduce the atherogenic properties of cholesterol. Curcumin, inhibited platelet aggration induced by arachidonate, adrenaline and collagen and thromboxane B2 production from exogenous arachidonate with a concomitant increase in the formation of 12-lipoxygenase products.

Spices are considered to increase milk secretion, promote menstruation, facilitate birth, alleviate symptoms of the male climacteric, and increase libido. Ginger root is a putative agent for preventing ageing dependent penile vascular changes and impotence. Many of the commonly consumed foods, herbs, and spices contain phytoestrogens and phytoprogestins. Reports from studies on animals models and in vitro system, leads us to direct future research perspectives in this area by targeting study of systemic, planned, blinded trials, study of diabetics, hyperlipidaemics, hypertensives, dysautonomics or metabolic syndrome X patients as well as patients of acid reflux disease, peptic ulcer, functional bowel disorders. The anti-inflammatory, antioxidant antiinflammatory as well as immune modulating roles of spices need further elaboration. Measuring an individual's food intake and assessing individual variation in disposition, bioavailability, and metabolism of micronutrients might allow for more accurate and individualized nutritional and nutraceutical approaches for dietary prescription. Dietary modifications will only work if they are in consonance with individual preferences, culture values, and philosophical orientations toward health and disease.

The Gut Microbiome: Learning from Past Lessions for Future

The human gut hosts about trillions of bacteria, the microbiome also called the newest enlarges organ in mammalian systems. The functional diversity and individuality expressed by our gut microbiome profoundly influences host immunity, metabolism and psycho neuro immune gut axis. Physiological immune homeostasis is achieved and maintained by bidirectional interplay as well as biological networking from systems through molecular level. Imbalances and modulation of gut microbiota is contributing to many metabolic and digestive pathologies such as obesity, metabolic syndrome, type I and type II diabetes, inflammatory bowel disease, colorectal cancer and immune senescence in the elderly.

Probiotic supplements are a constructive and viable adjunct to maintain, sustain and regain normal gastrointestinal function including secretion, permeability, motility, turnover and microflora. This benefit is both by top-down and bottom up interactions in the brain gut microbiome - metabolome axis. Our ability to induced diet based modifications can lead to positive clinical outcomes via modification of quantity and quality of gut microflora. It also affects many neurological, psychological and psychiatric comorbidities. Our traditional Indian Dietary wisdom and home based culinary practices combined with modern evidence based knowledge is important today to device functional foods and nutraceuticals. Thus identifying special disease associated motifs in bacteria, GI epithelium, GALT and physiological biomarkers can help us to formulate new products that alter microbial populations and Gene expression. Such bioactive probiotics, probiotics, antimicrobials biologics or more traditional drugs can treat these this orders and also help to device new molecular markers and lab tests to serve as personalise diagnostic therapeutic, prognostic and promotive tools for furthering health.

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3. CONCLUSION AND RECOMMENDATIONS

Nature endowed genetic profile versus nurture induced epigenetic modifications debate has been revisited and come full circle from integrative systems physiology through the various 'omics' to again nutritional systems biology traversing proteomics, metabolomics, adipo biology, gut microbiomics, geronto biology and Indian populomics as well as physiologic and cultural individuality. Thus Indian diet followed properly in modern context is a prescription for health and longevity.

Nutrition transition is very significant for Indian Population as genetically the thrifty gene hypothesis plays an important role

in etiopathogenesis of life style disease like obesity, metabolic syndrome, coronary artery disease, gut motility disorders, psychosomatic, autoimmune as well as degenerative disorders. Major transition is increasing use of sugar, processed food, beverages animal source foods and fast foods have impacted health. This is where back to basics and increasing use of traditional Indian foods like spices and curd can help. Extensive research within the last few decades from our laboratory and others has indicated that phytochemicals and dietary additives including spices and herbs in traditional Indian diet and Indian lifestyle practices may prevent various chronic metabolic and degeneratives illnesses including cancerous, diabetic, cardiovascular, pulmonary, gastrointestinal, neurological, dermatological and autoimmune diseases.

Our ability to induced diet based modifications can lead to positive clinical outcomes via modification of quantity and quality of gut microflora. It also affects many neurological, psychological and psychiatric comorbidities. Our traditional Indian Dietary wisdom and home based culinary practices combined with modern evidence based knowledge is important today to device functional foods and nutraceuticals. Thus identifying special disease associated motifs in bacteria, GI epithelium, GALT and physiological biomarkers can help us to formulate new products that alter microbial populations and Gene expression. Such bioactive probiotics, prebiotics, antimicrobials biologics or more traditional drugs can treat these disorders and also help to device new molecular markers and lab tests to serve as personalised diagnostic therapeutic, prognostic and promotive tools for furthering health.