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Prevention And Management Of Geriatric Diseases Through Energy Modulation By Yogic Technique

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Abstract:

The leading causes of mortality among aged people comprises of respiratory problems, heart diseases, cancer and stroke. Significant causes of morbidity among this group is chronic inflammatory and degenerative conditions such as Arthritis, Diabetes Osteoporosis, Alzheimer's disease, depression, psychiatric disorders, Parkinson's disease and age related urinary problems showing the paradigm shift of morbidity and mortality from communicable diseases to non-communicable one. The biggest challenge with geriatric diseases is that in most of the cases the condition cannot be attributed to a single cause or in certain conditions of neuro-psychiatric disorders like, Senile dementia, Alzheimer's disease, depression, the structural cause is unknown. In such cases the conventional medical therapy fails to come out with effective management plan and hence is severely compromised. Another challenge with conventional medical therapy is that it does not have specific health-promoting agents. The word "*yoga*" comes from the Sanskrit root *yuj*, which means "to join" or "to yoke". Yoga is an ancient art based on a harmonizing system of development for the body, mind, and spirit. Patanjali's famous definition of yoga is "*yogas chitta vritti nirodhah*", which means "yoga is the controlling the fluctuations of the mind". *Chitta* is mind, *vrittis* are thought impulses, *nirodah* is completely retraining. Yoga is method of channelizing energy through various physical and mental exercises. One can channelize his/her energy and can use it for fruitful purpose or destructive purpose. The paper will throw light on energy channelizing process through Yogic practices and its importance in combating geriatric diseases.

Key Words: Energy Channelization, Patanjali, Senile diseases, Yoga.

Introduction:

The World population of the elderly is increasing and by the year 2050, adults older than 65 years will comprise 1/5th of the global population[1]. In India 3.8% of the population are older than 65 years of age[2]. According to an estimate the likely number of elderly people in India by 2016 will be around 113 million. The cause of morbidity and mortality world over is shifting from communicable diseases a few decades ago to non-communicable diseases[3]. The leading causes of mortality among aged people comprise respiratory problems, heart diseases, cancer and stroke. Significant causes of morbidity among this group is chronic

inflammatory and degenerative conditions such as Arthritis, Diabetes Osteoporosis, Alzheimer's disease, depression, psychiatric disorders, Parkinson's disease and age related urinary problems.

Maintenance of homeostasis is pivotal to all forms of life. Re-establishment of homeostasis in response to environmental perturbations requires reprogramming of metabolism and gene expression to shunt energy sources from growth-related biosynthetic processes to defense, acclimation, and, ultimately, adaptation. Failure to mount an initial 'emergency' response may result in nutrient deprivation and irreversible senescence and cell death[4]. Recent studies lend credence to this hypothesis, underpinning the importance of a shared energy signal in the transcriptional response to various types of stress. Energy deficiency is associated with most environmental perturbations due to their direct or indirect deleterious impact on respiration[5]. Several systems are known to have evolved for monitoring the available resources and triggering metabolic, growth, and developmental decisions accordingly. In doing so, energy-sensing systems regulate gene expression at multiple levels to allow flexibility in the diversity and the kinetics of the stress response.

Role of Integrative medicine (IM) in Health Care

Integrative medicine approaches have gained significant interest in recent years to provide a solution for the health care challenges. Yogic cognitive-behavioral practices are among the most widely used IM approaches and include diverse practices such as yoga asanas, meditation, breathing exercises, Qi Gong, Tai Chi Chih, and various others. Studies to date suggest that these yogic/meditative practices have significant positive effects on the mind–body system and thereby can increase wellness and support the healing process from disease. Previous work has provided evidence for both psychological and physiological effects of these practices; however, the mechanisms of these effects, especially at the molecular level, have largely been missing. Recent studies provide some clue that these measures modulate gene expression profiling in circulating immune cells, which support the hypothesis that yogic/meditative practices have a measurable effect at the molecular level[6].

The great similarity of the genomes of humans and other species stimulated to search for genes regulated by elements associated with human uniqueness, such as the mind–body interaction. DNA microarray technology offers the advantage of analyzing thousands of genes simultaneously, with the potential to determine healthy phenotypic changes in gene expression.

The changes in gene expression of yogic practitioners in contrast to normal healthy controls were characterized by enhanced immunity, downregulation of cellular metabolism, and alteration of apoptotic genes in favor of a rapid resolution of inflammation. The lifespan of normal neutrophils was prolonged, while the inflammatory neutrophils displayed accelerated cell death in yogic practitioners as determined by enzyme-linked immunosorbent assay. Correlating with enhanced immunity reflected by microarray data, neutrophil phagocytosis was significantly increased in yogic practitioners. Some of the altered genes

observed by microarray were confirmed by RPA. The result of research studies showed that Yogic practice may regulate immunity, metabolic rate, and cell death, possibly at the transcriptional level.

The relaxation response (RR) has been defined as a mind-body intervention that offsets the physiological effects caused by stress. The RR has been reported to be useful therapeutically (often as an adjunct to medical treatment) in numerous conditions that are caused or exacerbated by stress. Mind-body approaches that elicit the RR include-Yoga. One way that the RR can be elicited is when individuals repeat a word, sound, phrase, prayer or focus on their breathing with a disregard of intrusive everyday thoughts. The non-pharmacological benefit of the RR on stress reduction and other physiological as well as pathological parameters has attracted significant interest in recent years to decipher the physiological effects of the RR[7]. In addition to decreased oxygen consumption, other consistent physiologic changes observed in long-term practitioners of RR techniques include decreased carbon dioxide elimination, reduced blood pressure, heart and respiration rate, prominent low frequency heart rate oscillations and alterations in cortical and subcortical brain regions.

Gene expression changes associated with the RR[8]

It is becoming increasingly clear that psychosocial stress can manifest as system-wide perturbations of cellular processes, generally increasing oxidative stress and promoting a pro-inflammatory milieu. Stress associated changes in peripheral blood leukocyte expression of single genes have been identified. More recently, chronic psychosocial stress has been associated with accelerated aging at the cellular level. Specifically, shortened telomeres, low telomerase activity, decreased anti-oxidant capacity and increased oxidative stress are correlated with increased psychosocial stress and with increased vulnerability to a variety of disease states. Stress-related changes in GEP have been demonstrated by microarray analysis in healthy subjects, including up-regulation of several cytokines/chemokines and their receptors, and in individuals suffering from post-traumatic stress disorder, including inflammation, apoptosis and stress response as well as metabolism and RNA processing pathways. The pro-inflammatory transcription factor NF-kappa B (NF-κB) which is activated by psychosocial stress has been identified as a potential link between stress and oxidative cellular activation[9].

The RR is clinically effective for ameliorating symptoms in a variety of stress-related disorders including cardiovascular, autoimmune and other inflammatory conditions and pain. It is hypothesize that RR elicitation is associated with systemic gene expression changes in molecular and biochemical pathways involved in cellular metabolism, oxidative phosphorylation / generation of reactive oxygen species and response to oxidative stress and that these changes to some degree serve to ameliorate the negative impact of stress. Overall, similar genomic pattern changes occurred in practitioners of a specific mind body technique as well as in long-term practitioners who utilized different RR practices including Vipassna, mantra, mindfulness or transcendental meditation, breath focus, Kripalu or Kundalini Yoga, and repetitive prayer. This indicates there is a common RR state regardless of the techniques used to elicit it.

Hypoxia induces profound changes in the cellular gene expression profile. The discovery of a major transcription factor family activated by hypoxia, HIF (hypoxia-inducible factor), and the factors that contribute to HIF regulation have greatly enhanced knowledge of the molecular aspects of the hypoxic response. However, in addition to HIF, other transcription factors and cellular pathways are activated by exposure to reduced oxygen[10].

Vascular endothelial growth factor (VEGF) is a potent mitogen specific for endothelial cells[11]. Its expression is dramatically induced by low oxygen tension in a variety of cell types, and it has been suggested to be a key mediator of hypoxia-induced angiogenesis. Although VEGF action is targeted to endothelial cells, it is generally believed that these cells do not express VEGF[12]. In addition, the mechanisms by which hypoxia regulates VEGF production remain unclear.

Hypoxia has been reported to regulate the expression of many genes, but the mechanisms involved are poorly understood. An activity termed HIF-1 has been shown to increase the expression of Epo in response to hypoxia, and more recently, HIF-1 binding sites have been identified in the genes encoding a number of glycolytic enzymes[13].

Mitochondrial DNA (mt DNA) encodes critical subunit proteins of the oxidative phosphorylation (OXPHOS) complex that generates ATP. Mitochondrial gene expression in cell is regulated by energy demand, as modified via stimulation of cellular sodium transport. Results of research suggest a physiological transcriptional mechanism of regulation of mitochondrial gene expression by energy demand and a post-transcriptional regulation that is independent of energy status of the cell.

From the above discussion it is clear that Yoga act as energy modulator by channelizing oxygen consumption and demand there by modify the energy signal in the transcriptional response to various types of stress related gene expression at multiple levels to allow flexibility in the diversity and the kinetics of the stress response. The changes in gene expression of yogic practitioners is associated with systemic gene expression changes in molecular and biochemical pathways involved in cellular metabolism, oxidative phosphorylation / generation of reactive oxygen species and response to oxidative stress. Thus Yoga is very helpful in oxidative stress related degenerative senile diseases.

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