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Disease Prevention and Health Promotion in the Aging with a Traditional System of Natural Medicine—Maharishi Vedic Medicine (MVM)

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Abstract

This review focuses on a comprehensive and sophisticated system of natural medicine that appears to hold promise for prevention of chronic diseases and disabilities, loss of independence, suffering, and enormous health care costs often associated with ‘usual’ aging. We first discuss the negative impact of usual aging on our society, with its rapidly-growing percentage of elderly, and the challenge of how to promote “successful aging”. Emphasis is given to the research literature suggesting that Maharishi Vedic Medicine (MVM) is particularly effective in retarding ‘usual’ aging. Proposed mechanisms for the anti-aging effects of MVM include reductions in physiological and psychological stress and enhancement of homeostatic and self-repair processes. We conclude that this set of innovative strategies may help society achieve recommended health objectives for disease prevention and health promotion in older adults, and that wide-spread implementation of this self-empowering, prevention-oriented approach in the elderly is feasible, cost-effective and timely.

Keywords

usual aging; successful aging; Vedic Medicine; health promotion; disease prevention

Introduction

The US is an aging society. In 1996, the elderly (those over 65 years) constituted more than 13% of the population, by 2030, the proportion of elderly will nearly double (Perry, 1999). Concomitantly, disability and morbidity associated with an aging population have also increased (Guralnik, 1993; Fries, 1999). The reductions in infectious diseases earlier in this century have been subsequently offset by increases in the prevalence of chronic diseases (e.g., cardiovascular disease and cancer) that have become the dominant causes of disability and

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mortality in the elderly (Hoffman, 1996). A decreasing mortality rate, healthier lifestyles, and advances in medical technology and in public health have prolonged the life-span but not the health-span and have contributed to the increasing number of individuals with chronic conditions.

Despite improvements in public health, however, the ten leading causes of death for persons over age 65 have not changed appreciably in the past few decades. The major diseases that have greatly increased in prevalence and severity with advancing age include coronary heart disease, stroke, cancer, dementia, osteoporosis and musculoskeletal disorders (Alliance for Aging Research, 1995; Perry, 1999).

The costs of aging have also gone up. In 1998, Medicare outlays for hospital and medical services for some 33 million older Americans with aging-related disorders exceeded \$200 billion or more than 10% of the federal budget. This is almost double the cost of Medicare as recently as 1990. Given this exorbitant rate of increase, it has been projected that Medicare may go bankrupt by 2007, four years before the first baby boomer turns 65 (Perry, 1999). Given the staggering costs of medical care for the unhealthy elderly, gerontological experts and health care policy makers are seriously asking themselves whether they should continue to devote resources to the provision of acute care or allocate more of them to prolong independent functioning of seniors in the community setting (Institute of Medicine, 1990; Hodes, 1996; Butler, 1999). It has been posited that the successful containment of health care costs will depend on our collective ability to prevent age-related diseases and disabilities that generate the greatest needs for long-term care (Schneider, 1990; Mendelson, 1993).

Successful Aging vs. Usual Aging

Rowe and Kahn proposed a distinction between *usual aging* and *successful aging* (Rowe, 1987; Rowe, 1997; Rowe, 2000). They distinguished between two groups of non-diseased older persons – a usual aging group that is nonpathologic but at high risk, and a successful aging group that is at low risk and high function. By making this distinction, they countered a long-standing belief that usual aging is determined by intrinsic aging processes, primarily genetic (Rowe, 1997). They concluded that successful aging has three main components: 1) a low probability of disease and disease-related disability, 2) a high capacity for cognitive and physical functioning, and 3) an active engagement with life including interpersonal relations and productive activity (Rowe, 2000).

It is now clear that usual aging and the risk associated with it for adverse health events, may be both preventable and even reversible. Indeed, recent research strongly indicates that, with appropriate interventions, many processes associated with usual aging can be slowed, or even reversed. For example, carbohydrate intolerance, osteoporosis, and high blood pressure—all correlates of usual aging—can be modified by behavioral, lifestyle interventions such as exercise, diet, and/or stress reduction (Rowe, 1987; Schneider, 1990; Schneider, 1995; Sticht, 1995). Similarly, neurobehavioral aging, including cognitive declines, may not be inevitable (Finch, 1987). According to gerontological experts, the health care and self-care strategies likely to be effective in facilitating the transition from usual to successful aging are interdisciplinary approaches that include behavioral, biomedical, nutritional, and other interventions (Committee on a National Research Agenda on Aging - Division of Health Promotion and Disease Prevention, 1991; Rowe, 1991; Steel, 1997; Swan, 1999).

Aging as an Integrated Phenomenon

Although the causes of aging are heterogeneous and incompletely understood (Harman, 1991) some common principles have been suggested. One such principle is integration, originally proposed by Cannon (Cannon, 1939). This integration or interconnectedness of

physiological systems may underlie and explain theories of aging that have been advanced (Bjorksten, 1968; Walford, 1969; Rockstein, 1974; Hayflick, 1987; Warner, 1987; Medvedev, 1990). Of all these theories of aging, the free radical theory is most prominent (Harman, 1994; Ji, 1999). This integrative theory suggests that damage due to ubiquitous oxygen free radicals (e.g., superoxide) and non-radical oxidants (e.g. hydrogen peroxide) is a fundamental physiological process of aging-related deterioration. Moreover, it has been suggested that free radical activity or oxidative stress may be accelerated by psychosocial stress (Santos, 1988; Adachi, 1993; Patterson, 1993; Scarpellini, 1994; Schneider, 1998). Therefore, it would appear that health care strategies that effectively reduce the chronic consequences of psychosocial stress and oxidative stress, improve internal stress resistance and recovery and simultaneously promote balance and homeostasis among integrated physiological systems may be an important strategy for minimizing ‘usual aging’ and achieving ‘successful’ aging.

In the following section, we review a traditional and comprehensive system of natural health care which has been purported to slow aging and extend longevity and has recently been re-evaluated for its application in modern society. To date, a considerable body of research has shown that several modalities of this health care approach substantially reduce chronic stress-related diseases, promote health, vitality, mental well-being and cognitive functioning which are consistent with prevention of usual aging and promotion of successful aging as described by Rowe and Kahn (Rowe, 1997; Rowe, 2000).

Maharishi Vedic Medicine — Background and Theoretical Perspective

Maharishi Vedic Medicine (MVM) has been described as a time-tested, comprehensive system of prevention-oriented natural medicine (Nader, 1995; Maharishi Mahesh Yogi, 1995a; Schneider, 1997). MVM is reported to be the oldest continuously practiced medical system, having its heritage in the ancient Vedic civilization of India. (World Health Organization, 1978; Bannerman, 1983; Thatt, 1986; Kurup, 1993; Sharma, 1998). “Veda” in Sanskrit means “knowledge”, and the Vedic tradition with its classical literature has been described as “total knowledge” of health. (Maharishi Mahesh Yogi, 1994; Nader, 1995). Vedic medicine, including Ayur-Veda, has been recognized by the World Health Organization as a sophisticated system of natural medicine with a detailed scientific literature consisting of classical medical texts, an uninterrupted oral tradition of classical knowledge predating the written texts, a comprehensive *materia medica*, and a wide breadth of clinical procedures relevant to prevention and treatment of acute and chronic diseases (Bannerman, 1983; Thatt, 1986). The recent availability of Vedic Medicine worldwide has resulted from the systematic investigation and restoration of the original texts and practical applications by Maharishi Mahesh Yogi in collaboration with leading traditional physicians, scientists and Vedic scholars (Nader, 1995; Maharishi Mahesh Yogi, 1995a; Schneider, 1997). . Over the last 30 years, more than 600 scientific research studies have been conducted on various MVM treatment and prevention modalities at over 200 research institutions and universities in 33 countries (Orme-Johnson, 1977; Chalmers, 1990; Wallace, 1990; Sharma, 1996).

Recently, remarkably precise correlations between human neurophysiological structures and function and the 40 aspects of the Veda and Vedic literature have been reported (Nader, 1995). These correlations suggest a coherent framework for contemporary understanding of Maharishi Vedic Medicine.

In Maharishi Vedic Medicine, therapeutic, diagnostic and preventive modalities are drawn from the broad range of Vedic literature and are said to holistically enhance the body’s innate self-repair and homeostatic mechanisms, thereby preventing disease and promoting health. Diseases are reportedly addressed by treating their ultimate causes—disruptions of the body’s ‘inner intelligence’ (Nader, 1995). According to MVM, it is this ‘inner intelligence’ which

structures and governs the human body and is seen as a lively and orderly expression of the same intelligence of Natural Law which structures and governs the entire universe. (Maharishi Mahesh Yogi, 1995a; Schneider, 1997). To further elucidate,

When the total intelligence of Natural Law—Veda—is lively in the individual physiology, there is perfect synchrony between the functioning of the body as a whole, and between individual intelligence and Cosmic intelligence. With this complete integration, all thought and action are spontaneously in harmony with Natural Law and the individual enjoys perfect health. (Maharishi Mahesh Yogi, 1995a)

This ancient Vedic perspective of an underlying field of ‘intelligence’ is consistent with modern theories of quantum physics (Hagelin, 1989). For example, Einstein originally postulated a single unified field of natural law at the basis of all the force fields and matter fields in the universe (Hagelin, 1989). In the quantum mechanical view, the physical particles which structure the universe are ultimately frequencies of wave functions of the self-interacting dynamics of the unified field. Similarly, from the Vedic perspective, the universe, including the human body, is the expression of self-interacting impulses of intelligence (Hagelin, 1989; Nader, 1995). MVM further identifies this unified field as being identical to the field of human consciousness (Hagelin, 1987).

Approaches of MVM include techniques to reduce psychosocial stress; pulse diagnosis, diet and herbal food supplements for the systematic detection and dissolution of physiological imbalances. Other strategies involve physiological purification and behavioral recommendations. Still others take advantage of knowledge of the effects of the near environment (Vedic architecture) and distant environment on health. Finally, there are technologies for reducing social stress and enhancing collective health (group practice of the TM and advanced TM-Sidhi programs). These approaches are largely missing from modern medicine (Schneider, 1997). The experimental data relevant to aging on these different approaches are reviewed below. In the last 30 years, the majority of studies on MVM have been on 1) the TM program; 2) herbal nutritional supplements and 3) traditional physiological purification procedures. The remainder of this paper reviews the scientific research on these three traditional MVM modalities.

1) The Transcendental Meditation Program

Description of the Transcendental Meditation (TM) Program—Over 6 million individuals worldwide have learned the TM program over the last 40 years. The TM technique is described as a simple, natural and effortless procedure practiced twice a day for 20 minutes while sitting comfortably with eyes closed (Roth, 1994). It requires no changes in beliefs, philosophy, religion or life-style. Clinical reports indicate that this technique can easily be learned by individuals of any age, level of education, occupation, or cultural background (Alexander, 1993; Roth, 1994).

During the practice of the TM technique, one’s awareness gradually settles down to states of lesser excitation and is eventually experienced as remaining silently awake within itself (Maharishi Mahesh Yogi, 1963; Roth, 1994). The attainment of this state, which is one of restful alertness, is reported by TM practitioners as an experience in which the ordinary thinking process is “transcended”. This state also serves to distinguish the TM technique from other meditation and relaxation techniques that use contemplation and concentration and thus may increase mental activation (Orme-Johnson, 1998).

According to the MVM model, the consideration of consciousness is the fundamental element missing from modern medicine. In the Maharishi Vedic approach to health (synonymous with MVM), development of consciousness is achieved through the Transcendental Meditation® (TM®) and TM-Sidhi® programs (Maharishi Mahesh Yogi, 1963; Maharishi Mahesh Yogi,

1967; Roth, 1994; Nader, 1995). The prevention and health promotion effects of these programs for aging are thought to occur through the enhancement of the body's inner intelligence, thereby allowing the physiology to eliminate accumulated stress. This, in turn, is proposed to promote mental, emotional and physiological balance, and mind/body integration (homeostasis). Studies evaluating the validity of this model are reviewed below using outcome measures associated with the aging process.

Effects of the Transcendental Meditation program on physiological correlates of aging—Wallace, et al used a previously validated and standardized index of biological aging — the Morgan Adult Growth Examination (auditory discrimination, near-point vision accommodation, and systolic blood pressure) (Morgan, 1972) - on 84 subjects (mean age = 53 years) (Wallace, 1982). Results indicated that long-term TM practitioners (> 5 years meditating) had a mean biological age 12 years younger than their mean chronological age. Short-term TM meditators were 5 years younger and the non-meditator controls were 2 years younger. TM groups differed significantly from age-matched controls. The study statistically controlled for potentially confounding effects of diet and exercise.

Levels of serum dehydroepiandrosterone sulfate (DHEAS) have been shown to decline with age (Orentreich, 1984). Glaser, Brind, et al. compared DHEAS levels in 328 TM practitioners to 1462 controls (Glaser, 1992). Both male (+23%) and female (+47%) TM subjects had significantly higher levels of DHEAS, the difference being especially pronounced for older subjects (age > 45) whose DHEAS levels were comparable to levels in controls 5–10 years younger. This finding was supported by a second cross-sectional study in women TM practitioners which found that DHEAS correlated with months of practice of the TM program (Walton, 1995).

Effects of the Transcendental Meditation program on neurophysiological correlates of aging—TM practice in adults was also associated with enhancement of neurocognitive function including reaction times (Holt, 1978; Cranson, 1991), efficiency of reflex responses (Warshal, 1980; Wallace, 1982) and auditory thresholds (Wallace, 1982). TM practice has been shown to increase alpha power and coherence in the EEG which are correlated with improved cognitive performance (Dillbeck, 1981). Measuring electrodermal activity, adult TM practitioners had larger skin conductance responses along with faster habituation to loud stressful tones (Orme-Johnson, 1973). This suggests a more adaptive style of functioning characterized by initially faster and greater orienting responses to novel or significant stimuli, followed by faster habituation. In contrast, usual aging is associated with less adaptable, less flexible neurophysiologic patterns of response (Birren, 1995).

Effects of the Transcendental Meditation program on cognitive correlates of aging—Consistent with neurophysiological findings, TM also appears to produce long-term changes in cognitive functioning that appear to be opposite in direction to those associated with usual aging. These TM-induced changes include enhanced short-term and long-term memory, and organization of memory as evidenced in learning tasks (Miskman, 1977; Dillbeck, 1982); incremental gains on fluid intelligence over a two- to four-year period (Cranson, 1991), improved perceptual flexibility (Dillbeck, 1982); and increased perceptual motor speed (Jedrzcak, 1984).

Effects Of The Transcendental Meditation Program on Chronic Disease and Health Patterns Associated with Aging—The healthcare utilization patterns of individuals with several clinical conditions and diseases which commonly afflict the elderly has been shown to improve with TM practice. Investigating the health insurance records of more than 2000 people practicing the TM program over five years, Orme-Johnson found significantly less health care utilization by the TM practitioners for all major disease categories

when compared to other groups (N ~ 400,000) of similar age, gender, profession, and insurance terms (Orme-Johnson, 1987). This included 87% less hospitalization for heart disease, 55% less for cancer, and 87% less for nervous system disorders. When these data were analyzed by age group, it was found that older TM subjects (> 40) had the greatest reductions in need for inpatient services (68% less) and outpatient medical services (74% less).

A later study (Orme-Johnson, 1997) of archival data from Blue Cross/Blue Shield Iowa, confirmed and extended this research to persons using, in addition to the TM program, a variety of other MVM modalities including herbal supplements. The 4-year total medical expenditures per person in the MVM group, for all ages and all disease categories, were 59% and 57% lower, respectively, than the norm (n=600,000) and a demographically matched control group (n = 4,148). The greatest savings were seen among older MVM users (age >45) who had 88% fewer inpatient days compared to controls. For example, hospital admissions were 11.4 times higher for the controls than the MVM group for cardiovascular disease, 3.3 times higher for cancer, and 6.7 times higher for mental health and substance abuse (Orme-Johnson, 1997).

Effects Of The Transcendental Meditation Program on Hypertension and Cardiovascular Disease in the Aging—At least 11 published studies have reported beneficial effects of the TM program on individuals with hypertension (Schneider, 1992). A review and quantitative meta-analysis of 26 studies indicated that the TM technique produced a significantly larger reduction of high blood pressure than did other forms of meditation or meditation-like techniques (Orme-Johnson, 1998). For example, in a prospective randomized controlled study by Alexander et al. on the effects of TM in the elderly (mean age = 80), the TM group showed a mean reduction of 12 mm Hg over a 3-month period compared to modest change or no change for the two other relaxation treatment conditions (Alexander, 1989).

In the most rigorous study to date on TM and hypertension in the elderly, Schneider et al (Schneider, 1995) conducted a randomized controlled, single-blind clinical trial on 127 African Americans (average age 66 years) with mild hypertension. This included a three month follow-up period in a primary care, inner city health center. Compared to a lifestyle modification education control (EC), TM intervention significantly reduced systolic blood pressure by 10.7 mm Hg and diastolic blood pressure by 6.4 mm Hg. A parallel progressive muscle relaxation (PMR) intervention lowered systolic blood pressure by 4.7 mm Hg and diastolic blood pressure by 3.3 mm Hg, but, TM lowered BP significantly greater than PMR. Regularity of practice for the TM group was 97% (81% for PMR).

Effects of the Transcendental Meditation Program on Mortality in the Elderly—A randomized controlled study exclusively targeted the effects of TM to the advanced elderly (mean age=81 at intake) (Alexander, 1989). Over a three-year period, the TM group improved most, followed by mindfulness training, and then by the no-treatment and relaxation groups, for the following measures: paired associate learning, two measures of cognitive flexibility, systolic blood pressure, self-ratings of behavioral flexibility and aging, multiple indicators of treatment efficacy, and mental health after 18 months. After three years, survival rate for TM was 100% and mindfulness 87.5% in contrast to mental relaxation (65%) and no treatment (77%). The baseline survival rate for the 478 nonparticipating elderly was 62.5%.

2) Maharishi Vedic Medicine Herbal Supplements

The classical Vedic medicine texts describe certain herbal preparations for specific diseases, and other herbal preparations called *rasayanas*, which are proposed to promote general health by increasing resistance to disease, activating tissue repair mechanisms, and arresting or reversing deteriorative effects associated with aging (Sharma, 1984). Each herbal preparation contains various herbs or plant parts, each herb having hundreds or thousands of

phytochemicals (Sharma, 1997). According to traditional Vedic and modern theories, by using the combined herbal preparation rather than using the isolated chemical active ingredients, the various chemical constituents may function synergistically and mitigate adverse side effects associated with individual components (Sharma, 1996).

To date, the majority of research on these herbal preparations called 'rasayanas' has involved two compounds collectively called 'Maharishi Amrit Kalash' (MAK), its commercially available name. MAK-4 and MAK-5 contain distinctly different combinations of herbs. MAK-5, available in tablet form, consists of *Gymnema aurantiacum*, *Hypoxis orchoides*, *Tinospora cordifolia*, *Sphaeranthus indicus*, butterfly pea, licorice, *Vanda spatulatum*, *Lettsomia nervosa*, and Indian wild pepper. MAK-4, available as a 'fruit paste', consists of raw sugar, ghee (clarified butter), Indian gallnut, Indian gooseberry, dried catkins, Indian pennywort, honey, nutgrass, white sandalwood, butterfly pea, shoeflower, aloewood, licorice, cardamom, cinnamon, Indian cyperus, and turmeric. Although quantitative chemical analyses has not been performed, both MAK-4 and MAK-5 have been shown on qualitative chemical analysis to include a mixture of low-molecular weight substances and antioxidants, such as alpha-tocopherol, beta-carotene, ascorbate, bioflavonoids, catechin, polyphenols, riboflavin, and tannic acid (Rao, 1987; Kapoor, 1990) (Kar, 1986) (Duke, 1985). In the classical literature, MAK has been reported to promote longevity, vitality, physiological balance, youthfulness, and resistance to disease (Sharma, 1984; Sharma, 1996).

Below we review several studies relevant to prevention and treatment of aging-related disorders.

Antioxidant Properties of MAK—Researchers have found that both MAK-4 and MAK-5 scavenge oxygen free radicals in a dose-dependent manner, thereby ameliorating their deleterious effects. Reactive Oxygen Species (ROS) scavenged by MAK-4 and MAK-5 include superoxide, hydroxyl, and peroxy radicals, and hydrogen peroxide generated both in cellular (neutrophil) and noncellular (xanthine-xanthine oxidase) systems (Niwa, 1991; Bondy, 1994). MAK-4 and MAK-5 have also been shown to reduce levels of lipid peroxide, a marker of free radical damage, and inhibit oxidation of low-density lipoproteins (LDL), reduce platelet activation and reduce angina pectoris and the development of atherosclerotic lesions (Sundaram, 1997).

Anti-Oxidant Effects of MAK—Analysis of MAK components identifies a large number of natural antioxidants (Bondy, 1994). Niwa et al. found MAK-4 and MAK-5 to be efficient scavengers of common free radicals and oxidants including superoxide anion, hydroxyl radical, and hydrogen peroxide (Niwa, 1991). Aqueous and alcoholic extracts of MAK-4 and MAK-5 inhibited hepatic microsomal lipid peroxidation (Dwivedi, 1991). Sharma et al found that MAK-4 and MAK-5 were approximately 103 times more potent than probucol in preventing 50% oxidation of LDL (Sharma, 1992). Animals pre-treated with MAK showed no evidence of toluene-induced free radical damage to the cerebellum compared to toluene-exposed control rats (Bondy, 1994). Whereas usual aging is thought to be related to oxidative tissue damage caused by free radicals and non-radical oxidants, MAK, in contrast, has been shown to have a powerful anti-oxidant effect and therefore should have an anti-aging effect.

Anticancer effects of MAK—Sharma, et al, found that a 6% MAK-4 diet provided greater than 60% protection against DMBA-induced breast cancer in rats both during initiation and promotion phases. Control animals who developed tumors showed tumor regression in 60% of the cases when later supplemented with MAK-4 in the diet for four weeks (Sharma, 1990). Since the above cancer model may involve free radical mechanisms and MAK appears able to scavenge free radicals in vivo; hence it is also likely that MAK would have anti-cancer and anti-aging effects in humans.

Cardiovascular disease and MAK—Cardiovascular disease is the #1 cause of death among the elderly. MAK's ability to prevent both LDL oxidation, platelet aggregation and lipid peroxidation due to a high-cholesterol diet, suggests that MAK may help prevent atherosclerosis in humans.

A study by Sundaram, et al found that hyperlipidemic patients supplemented with MAK-4 for 6 months had a profound time-dependent reduction in their LDL oxidation by Cu^{+2} and endothelial cells (Sundaram, 1997). Lee et al. found significant reductions in lipid peroxides, increased glutathione peroxidase and resistance of LDL to endothelial cell-induced and cupric ion-catalyzed oxidation in Wantanabe Heritable Hyperlipidemic (WHHL) rabbits receiving MAK-4 for 6 months (6% diet) (Lee, 1996). In addition, there was a significantly lower percentage area of atheroma in the MAK-4 group compared to controls. Lee et al. also tested organ functions in WHHL rabbits on a 6 month 6% MAK-4 supplemented diet. Functional tests for liver, kidney, pancreas, carbohydrate metabolism, immunity, inflammation and tissue damage indicated significant prevention of organ damage by MAK-4..

Platelet aggregation occurs abnormally under a variety of stresses, and may trigger myocardial infarction, strokes, and other vascular diseases. In vitro studies showed that MAK-5 prevents platelet aggregation when platelets are exposed to any of several well-known aggregation-inducers (Sharma, 1989).

Immune Effects of MAK—Weakened immune function has been implicated in the detrimental effects of usual aging (Walford, 1969). MAK appears to have an anti-aging effect on the immune system. Dilleepan et al. used animal and cell models to study the effects of MAK under a number of different conditions of immune challenge (Dilleepan, 1990). There were increases of 100% to 160% in T-lymphocyte proliferation depending on the MAK dosage.

Nervous System Effects and MAK—In humans, it is known that many neurally-based functions decline with age. MAK's central nervous system mechanisms may involve interactions with a variety of important neurotransmitter receptors or uptake sites including opioid receptors (Sharma, 1991b). A double-blind placebo controlled study was conducted to test the effect of MAK on an age-related alertness task (Gelderloos, 1990). Forty-eight men over 35 years of age were randomly assigned to receive MAK-5 tablets or a closely matched placebo twice daily for six weeks. The MAK group improved significantly more in their performance of this task after three and six weeks of treatment relative to the placebo group. Performance was highly correlated with age, and because successful performance apparently requires an unrestricted flow of homogeneous attention as well as focalized concentration, it is concluded that MAK may enhance attentional capacity or alertness, and thus reverse some of the detrimental cognitive effects of aging.

Summary: The experimental literature on MAK suggests that by producing antioxidant, antineoplastic, anti-atherosclerotic, immunomodulatory and central nervous system effects, this traditional medicine herbal preparation may have broad anti-aging effects in human populations.

3) Physiological purification techniques

In the area of physiological purification, MVM recommends multimodality purification therapies on a seasonal basis for enhancement of physiological homeostasis, removal of impurities (toxins) that accumulate over time, promotion of mental and emotional well-being and overall physical health (Sharma, 1996). These procedures have been described in the classical Vedic medicine texts and have been recently and collectively termed Maharishi Rejuvenation Therapy (MRT). These procedures are all prescribed and supervised by trained

physicians. Briefly, MRT consists of home preparatory procedures to loosen and remove superficial impurities by taking ghee (clarified butter) on several consecutive days followed by purgation with castor oil. This is followed by several days of an in-residence set of procedures to remove deeper-seated impurities, which are prescribed according to the individual's physiological imbalances and include whole-body medicated oil massage (abhyanga), flowing of medicated oil on the forehead (shirodhara), herbalized fomentation (swedana), nasal administration of herbs (nasya) and herbalized enemas (basti). Proposed physiological mechanisms of action for several of these procedures have been described (Smith, 1992).

In a controlled study, Schneider and coworkers found that 142 patients undergoing similar purification treatments had reported, after a one week treatment period, significantly greater improvements in well-being, energy-vitality, strength-stamina, appetite and significantly less anxiety, depression and fatigue than 60 control subjects who participated in a didactic class on MVM (Schneider, 1990). A more recent study found that following a typical 5 day purification program, total cholesterol fell acutely and HDL cholesterol rose significantly three months following treatment. Lipid peroxides and diastolic blood pressure also dropped while state anxiety measures improved significantly. Vasoactive intestinal peptide (VIP), a coronary vasodilator, rose significantly by 80%. (Sharma, 1993).

Conclusion and Future Directions

Both the absolute number of elderly and the percentage of elderly in the society is rapidly increasing. Nevertheless, a growing body of evidence suggests that what has been long been described as "usual aging" may actually be modifiable by behavioral and other interventions to promote more widespread successful aging. The challenge of how to promote successful aging—aging with enhanced health, rather than usual with disabilities—has therefore become critical for our society. Accordingly, national policy makers and gerontological experts have established national health objectives that call for studies of innovative health promotion strategies for the elderly. Experts in behavioral medicine and health care policy (Institute of Medicine, 1990; U.S. Dept of Health and Human Services, 1990; Rakowski, 1992; Schmidt, 1994) have suggested the following: {1} Utilize treatment strategies that address the causes of disease, not just the symptoms; {2} Provide Americans with a health care choice that is holistic; {3} Ensure cost-effective medical care. {4} Provide prevention as well as cure. {5} Incorporate positive lifestyle changes in treatment planning. {6} Incorporate treatments that have high compliance rates. {7} Close the health gap for the underserved including ethnic minorities and the elderly. {8} Consider natural alternatives or complements to pharmacological/surgical procedures when appropriate and feasible.

The research studies reviewed here on several modalities of MVM suggest that this traditional medicine approach that it may fulfill all eight of the above recommendations and thus, is worthy of widespread implementation. Another advantage of MVM is high compliance compared to conventional programs of lifestyle modification.

The hypothesized integrated mechanism of action of Maharishi Vedic Medicine is the enlivenment of the body's underlying 'inner intelligence' so that fundamental self-repair and defense mechanisms are enhanced including those controlling physiological, cellular, biochemical and psychophysiological functions. This re-organization and repair appears to reduce accumulated stress, processes that improve the function of organ systems, and allow for many beneficial neurophysiological and behavioral changes.

Forty percent of the general public has now used some form of natural complementary and alternative medicine (Eisenberg, 1993; Eisenberg, 1998). However, these approaches are often

applied in an unsystematic framework that has not been adequately subjected to rigorous empirical verification. In contrast, Maharishi Vedic Medicine offers the potential for a comprehensive, integrated, multidimensional approach that has been subjected to substantial empirical investigation. The implications of this comprehensive system of natural medicine for disease prevention and health promotion in the field of aging appear are highly relevant to the needs of modern society.

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