

Meditation Therapy in Cardiovascular and Metabolic Disorders Special Reference to Coronary Artery Disease and Diabetes

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Abstract

Meditation therapy is a new concept amongst the chronically sick individuals. Recently, interest has been created in spiritual healing either receiving blessings from highly spiritual person and/or through practice of meditation.

More recently meditation has been used in preventing various diseases particularly cardiovascular ailments. Still recently, meditation has been shown to be effective in coronary artery disease and various risk factors involved - particularly hypertension, hypercholesterolaemia and diabetes. Number of studies have shown that regular practice of Transcendental Meditation™ has been useful in reducing blood pressure significantly and lowering cholesterol and blood sugar. Very recently, Saral meditation has been reported to reduce BP and in a preliminary study has been shown to be effective in reducing blood sugar.

Introduction

Meditation therapy is a new concept created amongst chronically sick individuals. In recent decades mind body medicine has been an important field in health care where physicians consider that process of mind has a major impact in influencing the health of the body. Still recently interest has been created amongst chronically sick individuals in spiritual healing either through receiving blessings from highly spiritual person and/or through practice of meditation and meditation has entered the mainstream of healthcare as a method of stress and pain reduction and prevention of various metabolic and cardiovascular disorders.

Physiology of meditation

Scientific studies reveal that meditation

procedures a specific physiological response pattern that involves various biological systems. Mechanism most frequently suggested to meditate or produce meditative effects including metabolic, autonomic, endocrine, neurological, cardiovascular and psychological responses on a multidimensional interactive basis.

Meditation and Metabolism

Mental states can markedly alter physiologic function. For example, stressful situations result in a hypermetabolic state, with increased oxygen consumption, heart rate and blood pressure. In contrast, the majority of scientific studies show meditation to be a wakeful state accompanied by a decreased metabolism resulting in decreased breathing pattern, decreased heart rate, and decreased blood pressure. There is also marked decreased in the level of oxygen utilization and carbon dioxide elimination by muscles verified by innumerable studies.

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Oxygen consumption is generally regarded as a reliable index of physical activity and arousal. For example, exercise requires an increase in consumption of oxygen by muscles. During this metabolic process oxygen is converted to carbon dioxide which is eliminated by the lungs. However, oxygen starvation causes decrease in the concentration of oxygen and an increase in the concentration of carbon dioxide in arterial blood. Wallace *et al*¹ found that during the practice of meditation the amount of carbon dioxide elimination drops in proportion to amount of oxygen consumed without altering respiratory quotient (relative amount of oxygen and carbon dioxide in the blood). In other words, metabolic changes of meditation arise from a natural reduction of metabolic activity at the cellular level and not from a forced reduction of breathing. A study by Jevning *et al*² illustrates an increasing redistribution in the blood flow whereby blood flow to kidneys and liver decline in practitioners with a surprising increase in cardiac output as well as increased relative cerebral blood flow showing concomitant increase in the metabolism of certain tissues.

Meditation and hormones

A number of endocrine reactions have been identified in the meditative response pattern including reduced blood levels of lactate, cortisol and epinephrine.³ The reductions in these blood chemicals denote a state of decreased tension - an anxiety symptoms in normal subjects.¹ The decrease in lactate concentration during and after meditation may explain the subjective feelings of wakeful relaxation and that reduction in stress related chemicals persists into the post meditation period thereby reducing sensitivity to stress. It has also been demonstrated that meditation reduces sympathetic adrenergic receptor sensitivity producing a decreased response of

stressful situations.⁴ Increased levels of gamma aminobutyric acid (GABA), melatonin and dihydroepiandrosterone sulfate (DHEA-S) have been reported.⁵

GABA is an inhibitory neurotransmitter causing anxiolytic and tranquillizing effect acting through specific areas of brain.⁵ Melatonin has been associated with variety of biological functions in maintaining health and preventing age related disease. DHEA-S is an anti stress hormone⁶ which reduces age related disorders particularly cardiovascular disease and breast cancer. That the physical effects of meditations persists after the meditation period itself has been demonstrated by the fact that hypertension can be effectively controlled by meditation alone, without the use of any anti hypertensive drugs.⁷

Cardiovascular effect

Meditation has been shown to increase exercise tolerance and maximum cardiac work load in coronary artery disease patients compared to non meditators.⁸ Very recently, in a randomized clinical trial consisting of 103 patients of coronary artery disease (CHD) it was demonstrated that Transcendental Meditation (TM) for 16 weeks improved blood pressure and insulin resistance component of metabolic syndrome as well as cardiac autonomic nervous system compared with a control group receiving health education. These results suggest that TM may modulate the physiological response to stress and improve CHD risk factors, which may be a novel therapeutic target for treatment of CHD.⁹ Further, it has been demonstrated that Tai chi Chuan (TCC) meditation programme in low risk patients with coronary artery bypass surgery (CABG) after a post operative out patient (phase II) cardiac rehabilitation programme favourably enhance cardio-respiratory function.¹⁰ On the other hand

comprehensive brief lifestyle intervention based on yoga on some of biochemical indicators of risk for cardiovascular disease and diabetes mellitus leads to favourable metabolic effects within a period of 7 days.¹¹ Still recently, Rajayoga meditation has been shown to reduce serum cholesterol and low density lipoprotein – cholesterol in post menopausal women thus reducing the risk of coronary artery disease.¹²

In a comprehensive study on a blood pressure among elderly African-American it was found that Transcendental Meditation (TM) practice for a period of 3 months caused fall in systolic and diastolic BP by 10.6 and 5.9 mm of Hg compared to progressive muscle relaxation (PMR) control group 4.0 and 2.1 mm of Hg respectively.¹³ a second random assignment study conducted at Harvard found similar BP changes produced by TM over 3 months showing fall in 11 mg Hg of systolic BP.¹⁴ Recently it has been reported that TM improves blood pressure and insulin resistance¹⁵ and significantly reduces stress which increases risk of cardiovascular disease including stroke, angina pectoris and myocardial infarction and adult onset diabetes.¹⁶

Meditation and Diabetes Mellitus

Yogic exercise for 9 days have been reported to reduce cardiovascular effect as well as diabetes mellitus.¹¹ Regular practice of integrated type of yoga (which ends in meditation) has been reported to reduce blood sugar along with pulse rate and blood pressure.¹⁷

Medical Meditation of Dharam Singh Khalsa has claimed managing diabetes both type 1 and type 2 by strengthening pancreas which regulates bodies' insulin level by increasing blood flow to the area.¹⁸ Recently, a group of researchers at General Hospital at Bangkok studied 50 men and women with type II DM aged 42-80 yrs over a three week trial during which time they measured a blood

glucose after eating breakfast, this was followed by breathing meditation with significant improvement in post meal blood glucose level around 1 mmol/L lower alongwith significant lowering of blood pressure.¹⁹ Mention has been made about TM found to give benefits for people with diabetes and general healthcare improvements. Transcendental meditation suppresses stress response reducing plasma cortisol²⁰ which improves glycaemic control : initial benefit for 7/12 patients with type II diabetes having improvement with blood sugar control and enhancing the effect of weight loss. TM also enhances the effect of oral hypoglycaemic agents.²¹ Controlled studies have shown that TM is effective in hypertension in non diabetic subjects⁷ and reduce blood cholesterol on an 11 month period.²²

Saral Meditation

In a long term study preliminary data shows that practice of Saral Meditation for over a year reduces blood pressure and blood sugar.²³ The study is under progress and a short term study has been initiated.

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SCREENING AND PROSTATE-CANCER MORTALITY IN A RANDOMIZED EUROPEAN STUDY

In this trial, investigators tested the effect of prostate-specific-antigen testing on the death rate from prostate cancer in more than 162,000 men between the ages of 55 and 69 years in seven European countries. A significant reduction in prostate-cancer mortality was found after a median follow-up of 9 years. Over-diagnosis and overtreatment were important limitations of the screening programme.

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