Short Communication

Slow breathing and cardiovascular disease

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ABSTRACT

Cardiovascular disease is the leading cause of death for both men and women worldwide. Much emphasis has been placed on the primary and secondary prevention of cardiovascular disease. While depression and anxiety increase the risk of developing cardiovascular disease, cardiovascular disease also increases the risk of developing anxiety and depression. Thus, promoting optimal mental health may be important for both primary and secondary prevention of cardiovascular disease. Like lowering blood pressure, lipids, and body weight, lowering anger and hostility and improving depression and anxiety may also be an important intervention in preventive cardiology. As we strive to further improve cardiovascular outcomes, the next bridge to cross may be one of offering patients nonpharmacologic means for combating daily mental stress and promoting mental health, such as yoga and pranayama. Indeed, the best preventive cardiovascular medicine may be a blend of both Western and Eastern medicine.

Key words: Anxiety; blood pressure; cardiovascular disease; depression; hypertension; mental health; pranayama; prevention; slow breathing; stress; yoga.

INTRODUCTION

Cardiovascular disease is the leading cause of death for both men and women. In the United States, roughly 600,000 people die of heart disease every year. This equates to 1 in every 4 deaths resulting from cardiovascular disease. The most common type of heart disease is coronary heart disease, which itself costs the United States around $110 billion each year. The prevalence of myocardial infarction is over 700,000 annually.[1]

Much emphasis has been placed on the primary and secondary prevention of cardiovascular disease. Aggressive risk factor management is recommended, which has improved patient survival, reduced recurrent events and the need for interventional procedures, and improved the quality of life of these patients. Many trials have studied optimal management of lipids, diabetes, blood pressure, weight, and pharmacotherapy such as the importance of ACE inhibitors or ARBs, beta-blockers, and antiplatelet agents. However, there remains one lifestyle component, which has not received the attention it deserves for preventing cardiovascular disease: Mental health. As we strive to further improve cardiovascular outcomes, the next bridge to cross may be one of offering patients nonpharmacologic means for combating daily mental stress and promoting mental health. Indeed, the best preventive cardiovascular medicine may be a blend of both Western and Eastern medicine.

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MENTAL HEALTH AND CARDIOVASCULAR DISEASE: A LINK?

Depression and anxiety lead to a worse prognosis and outcome in patients with cardiovascular disease. While depression and anxiety increase the risk of developing cardiovascular disease, cardiovascular disease also increases the risk of developing anxiety and depression. Thus, promoting optimal mental health may be important for both primary and secondary prevention of cardiovascular disease.[2]

Anger and hostility in response to daily life events and stress may also be associated with an increased risk of cardiovascular disease. Higher hostility levels may be associated with increased carotid artery medial thickness and thus a more rapid rate of progression of atherosclerosis. Higher hostility levels have also been associated with restenosis after percutaneous coronary intervention.[3]

NONPHARMACOLOGIC INTERVENTIONS

Yoga is an ancient Indian discipline with the goal of bringing balance and health to the physical, mental, emotional, and spiritual dimensions of an individual. It consists of postures (asanas), concentration (meditation), slow breathing (pranayama), and recital of phrases (called mantras). While there are 84,000 postures, only 32 are recommended as being useful in regular practice.

Performing yoga a few times per week, with each session lasting roughly 20 min, is effective in treating hypertension, reducing angina episodes per week, improving exercise capacity, and decreasing body weight and waist circumference. It can also reduce serum cholesterol and LDL levels. Furthermore, it can decrease the frequency of revascularization, suggesting that yoga may facilitate regression and prevent progression of atherosclerosis, with a mechanism similar to that of statins. Yoga favorably effects diabetes by increasing insulin sensitivity and decreasing plasma insulin levels.[4]

Pranayama is a component of yoga and a form of slow breathing consisting of a respiratory rate of roughly six breaths per minute. It is one of the most practical and effective relaxation techniques. Several studies have been conducted both in India and the United States which have shown that pranayama, which takes 5 min to perform, immediately lowers resting blood pressure and permanently decrease resting blood pressure after several weeks of consistent practice. Several studies in the United States have replicated these findings by using a slow breathing device which guides patients to breath at a rate of six breaths per minute. One form of pranayama is to close the left nostril with the finger, slowly inhale through the right nostril for 10 s, then close the right nostril and exhale through the left nostril for 10 s. This is repeated by alternating which nostril does the inhalation and exhalation.[5-9]

CONCLUSION

We live in a fast-paced society with prevalent deadlines and pressures. Like lowering blood pressure, lipids, and body weight, lowering anger and hostility and improving depression and anxiety may also be an important intervention in preventive cardiology. Similar to how antihypertensives are prescribed to lower blood pressure and statins to lower lipids, it may also be beneficial to prescribe nonpharmacological interventions such as yoga and pranayama to lower mental stress and improve mood. While the effects of medications are temporary in the sense that stopping antihypertensives will again elevate resting blood pressure, the effects of consistent practice of yoga and pranayama are permanent, resetting the autonomic nervous system to one of parasympathetic dominance. This decreases arousal to external stimuli and thus decreases anger and hostility and improves mood. Furthermore, impaired baroreflex sensitivity has been proposed as one of the major causes of essential hypertension. Yoga is equivalent to head-up or head-down tilt and restores baroreflex sensitivity. And last, yoga and pranayama also offer some of the effects of pharmacotherapy as well, such as lowering blood pressure, lipids, hemoglobin A1c, and weight.

Yoga and pranayama are free, easy to learn, and take only 20 or 5 min per day to perform, respectively. They have no side effects but still offer the potential to reduce cardiovascular disease, thus improving long-term outcomes and reducing overall health care costs. The field of psychoneuroimmunology continues to develop and we are learning more and more about the mind-body connection, especially how it relates to cardiovascular disease. While we have done well conducting large-scale randomized trials for optimizing medical and interventional management of cardiovascular disease, the next steps may entail conducting large-scale randomized trials to evaluate nonpharmacologic interventions to promote mental health and well-being, and to study the effects of these interventions longitudinally on cardiovascular disease prevention.

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