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## Transcendental meditation improves blood pressure, insulin resistance

JUNE 16, 2006 Shelley Wood

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**Los Angeles, CA** - A meditation technique derived from an ancient Vedic tradition may help improve blood pressure, insulin resistance, and cardiac autonomic system activity, a new study shows. Researchers hypothesize that transcendental meditation (TM) may modulate the body's physiological response to stress, thereby improving these cardiovascular disease (CVD) risk factors, which are also key components of the metabolic syndrome.

Their study appears in the June 12, 2006 issue of the *Archives of Internal Medicine* [1].

Different meditation practices and deep-breathing techniques have been shown to help lower blood pressure, but as the authors point out, most of these studies were in the primary-prevention setting. "This study is the first study of transcendental meditation to address the mechanisms of disease in patients who already had established heart disease," senior author on the study, **Dr Noel Bairey Merz** (Cedars-Sinai Research Institute, Los Angeles, CA), said in an interview with heartwire. "Previous studies were all prevention studies that took people who had high blood pressure or who didn't, and they noticed a blood-pressure response. This is also the first time that anyone has looked at these other components, such as insulin resistance and heart-rate variability in response to transcendental meditation."

According to Merz, she and her colleagues became interested in transcendental meditation in part because of its documented effect on blood pressure, but also because of its wide use as a stress-management technique. "We thought it might be modulating the sympathetic and parasympathetic nervous system, so that's why we looked at heart-rate variability. We also unexpectedly saw this insulin-resistance effect, and that then led us to hypothesize that the sympathetic and parasympathetic or the autonomic nervous system may play a role in insulin sensitivity, insulin resistance, and the metabolic syndrome."

Merz, with first author **Maura Paul-Labrador** (Cedars-Sinai Research Institute) and colleagues, randomized 103 subjects with stable CHD either to instruction in, followed by practice of, transcendental meditation or to structured health-education sessions over a 16-week period. At follow-up and after adjustment for age, sex, systolic blood pressure, history of MI, depression and anger, body-mass index (BMI), and physical-activity level at baseline, the meditation group showed reductions in systolic blood pressure and insulin resistance, whereas the health-education group did not. Heart-rate variability, a measure of cardiac autonomic system activity, improved in the transcendental-meditation group but actually decreased slightly in the health-education group.

### Study outcomes

| Outcome                                       | Transcendental meditation | Health education | p    |
|---|---------------------------|------------------|------|
| Blood pressure (mm Hg)                        | -3.4                      | 2.8              | 0.04 |
| Insulin resistance (HOMA)                     | -0.75                     | 0.52             | 0.01 |
| Heart-rate variability (high-frequency power) | 0.10                      | -0.50            | 0.07 |

HOMA=homeostasis model assessment

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The authors note that the "chronic stress of ... modern society" may play a causal role in the development of metabolic syndrome through activation of the neurohormonal system, compounding the problems associated with poor eating habits and lack of regular activity. As such, these data support other studies that have underscored the important role of stress-management strategies as a way of reducing cardiovascular risk factors.

"These results suggest that neurohormonal pathways may be mechanistically involved in the metabolic syndrome," Paul-Labrador et al conclude. "Our findings also suggest that interventions that target neurohormonal pathways, especially via meditation or related techniques, may be beneficial for CHD reduction and should be tested in larger, more adequately powered clinical trials."

### A complement, not an alternative

Commenting on the findings for heartwire, **Dr Jeffery A Dusek** (Harvard Medical School and Mind/Body Institute, Boston, MA), who was not involved in the study, said that the results add to a growing body of research supporting a role for relaxation-response techniques in CHD prevention and treatment. Relaxation response, he notes, encompasses transcendental meditation, mindfulness meditation, deep breathing, and biofeedback exercises, among others, all of which have the effect of breaking the train of everyday thought and producing a meditative state.

Merz, for her part, pointed out that there are very few head-to-head studies comparing different types of meditation or relaxation-response methods.

"Transcendental meditation is one of the techniques that has been studied the most, and the most rigorously, in randomized controlled trials. We don't know that the other techniques wouldn't be as good, but we chose transcendental meditation because it's highly protocolized and standardized, whereas many of the others aren't. For instance, transcendental meditation is trademarked, you have to be a certified instructor to teach it. The other reason we selected TM was that there were prior studies that suggested a very consistent physiological response on blood pressure."

Interest in meditation in different forms as a treatment and prevention tool is growing. In separate research, Dusek and colleagues have been looking at mechanisms whereby relaxation-response methods could benefit CVD risk factors such as blood pressure and have found that deeper states of meditation were associated with increased nitric-oxide (NO) levels [2]. "NO is vasodilatory, so the hypothesis that we're exploring right now is that nitric oxide facilitates systolic blood-pressure changes," he told heartwire. "Four of the five major classes of antihypertensive drugs are NO-based, so it's possible that engaging in relaxation-response practices can regulate the synthesis of nitric oxide and help the endothelial cells produce NO at a more normal rate."

While this hypothesis was not addressed in Paul-Labrador's study, the net effect of meditation research helps validate the entire field of study, Dusek says. "The degree to which people are open-minded to trying these things depends on our ability to supply precise data: it's our obligation to provide good solid research to support why they should be trying this and what the health benefits are. That's why this paper and others really are important, so that we can do more than say, look, this should be good for you, we actually have evidence."

Dusek adds that it also puts the onus back on patients to take some responsibility for their own health. "That's the part of this that is so often lost, and especially in cardiovascular research, where the dollar amount that we spend in this country fighting CVD is so high," he observed. "This is not to disregard surgical techniques or pharmacology at all—but what we'd like to do is see whether we could have people do lifestyle modifications like relaxation-response techniques to enable them to be on as low a dose of drug as possible and to do as much as they can nonpharmacologically."

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