

Abstracts

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Acute Reversal of Endothelial Dysfunction in the Elderly After Antioxidant Consumption

Wray DW, Nishiyama SK, Harris RA, et al. Hypertension 2012;59:818-24.

Conclusion: Antioxidant consumption can acutely restore endothelial dysfunction in elderly patients.

Summary: Endothelial dysfunction likely contributes to atherosclerosis through a reduction in bioavailability of nitrite oxide (NO). There is also an age-related increase in plasma free radical concentration that contributes to a decrease in the bioavailability of NO. The authors investigated whether acute antioxidant treatment would result in a reversal of the decrease in endothelial function in elderly patients. As markers of endothelial function, the authors used flow-mediated vasodilatation and reactive hyperemia, which were evaluated after the individual consumed placebo or an oral antioxidant cocktail consisting of 1000 mg of vitamin C, 600 IU of vitamin E, and 600 mg of α -lipoic acid. This study was performed in 87 healthy volunteers, pairing 42 younger volunteers (25 ± 1 years) with 45 older volunteers (71 ± 1 years). This was a double-blind, crossover, designed study. Blood velocity and brachial artery diameter, as measured with ultrasound imaging, were assessed before and after 5 minutes of forearm circulatory arrest. Serum markers of lipid peroxidation, total antioxidant capacity, endogenous antioxidant activity, vitamin C, plasma nitrite, nitrate, and 3-nitrotyrosine were also determined. With placebo, there was an age-related reduction of brachial artery vasodilatation in young ($7.4\% \pm 0.6\%$) vs older ($5.2\% \pm 0.4\%$) patients. Antioxidant consumption improved flow-mediated vasodilatation in older participants (placebo, $5.2\% \pm 0.4\%$; antioxidant, $8.2\% \pm 0.6\%$). Flow-mediated vasodilatation declined after antioxidant therapy in younger participants (placebo, $7.4\% \pm 0.6\%$; antioxidant, $5.8\% \pm 0.6\%$). Age was associated with a reduction in reactive hyperemia, but antioxidants did not alter the response in the younger or older groups.

Comment: The data demonstrate that antioxidant consumption can acutely restore some elements of endothelial function in older patients. Antioxidants, however, apparently disrupt normal endothelial-dependent vasodilatation in younger individuals. The data must be rectified with clinical trials that have failed to demonstrate a beneficial effect of long-term antioxidant administration on cardiovascular health (Kris-Etherton PM et al, Circulation 2004;110:637-41). There are, however, certainly marked differences in study design between short-term interventional studies, such as in this report, and longer-term clinical trials of antioxidant therapy on cardiovascular health. The current study suggests some link between endothelial dysfunction and oxidative stress in older patients. The authors note the assay used in this study reflects peroxynitrite and that peroxynitrite may originate from multiple sources. The data cannot therefore be directly translated to imply potential benefits of long-term antioxidant therapy. Additional background work will be required before consideration of designing clinical trials evaluating the oral antioxidant cocktail used in this report.

Association of a Difference in Systolic Blood Pressure Between Arms with Vascular Disease and Mortality: A Systematic Review and Meta-analysis

Clark CE, Taylor RS, Shore AC, et al. Lancet 2012;379:905-14.

Conclusions: A difference of systolic blood pressure (SBP) of ≥ 10 mm Hg or ≥ 15 mm Hg between arms is potentially an indicator to identify patients who need further vascular assessment. A difference of ≥ 15 mm Hg could be a useful indicator of risk of vascular disease and death.

Summary: The most commonly advocated noninvasive screening study for detection of vascular disease is the ankle-brachial index (ABI). However, performing ABIs requires time, experience, and training, and despite recommendations, the ABI has not been widely adapted in the primary care setting. There is an established link between a 15-mm Hg difference between brachial pressures and subclavian stenosis (Agarwal R et al, Hypertension 2008;51:657-62) as well as atherosclerotic plaque (Shadman R et al, J Am Cardiol 2004;44:618-23). The National Institute for Health and Clinical Excellence (NICE) clinical guideline for hypertension in the United Kingdom indicates a difference of <10 mm Hg in SBP between arms is normal, with a difference of >20 mm of Hg occurring in $<4\%$ of the population and generally associated with underlying vascular disease (NICE: The clinical management of primary hypertension in adults. CG127. London: NICE; 2011). The authors investigated whether there is an association between differences in arm SBPs and peripheral vascular disease and death. The authors searched the MEDLINE, EMBASE, Cumulative Index to Nursing and Allied Health Literature, Cochrane, and Medline In Process databases for studies published before July 2011 that showed differences in

SBP between arms that was also associated with data for subclavian stenosis, peripheral vascular disease, cerebral vascular disease, cardiovascular disease, or survival. They then used random-effects meta-analysis to combine estimates of the association between differences in SBP between arms for each outcome. Of 28 studies eligible for review, 20 were included in this meta-analysis. Five invasive studies used angiography, with a mean difference in SBP between arms of 36.9 mm Hg (95% confidence interval [CI], 35.4-38.4) for proven subclavian stenosis ($>50\%$ stenosis). A difference of >10 mm Hg was strongly associated with subclavian stenosis (risk ratio [RR], 8.8; 95% CI, 3.6-21.2). Pooled findings of noninvasive studies showed a difference of >15 mm Hg was associated with peripheral vascular disease in nine cohorts (RR, 2.5; 95% CI, 1.6-3.8; sensitivity, 15% [range, 9%-23%]; specificity, 96% [range, 94%-98%]), pre-existing cerebrovascular disease in five cohorts (RR, 1.6; 95% CI, 1.1-2.4; sensitivity, 8% [range, 2%-26%]; specificity, 93% [range, 86%-97%]), and increased cardiovascular mortality in four cohorts (hazard ratio, 1.7; 95% CI, 1.1-2.5) and all-cause mortality (hazard ratio, 1.6; 95% CI, 1.1-2.3). A difference of >10 mm of Hg was associated with peripheral vascular disease in five studies (RR, 2.4; 95% CI 1.5-3.9; sensitivity 32% [range, 23%-41%]; specificity, 91% [range, 86%-94%]).

Comment: To vascular surgeons, this all seems patently obvious; however, from an epidemiologic and perhaps primary care point of view, the relative implications on death and the presence of vascular disease provided by a difference in SBP between the arms had not been previously quantified. Of course, what will need to be determined is whether interventions based on determining these differences in SBP between arms will actually result in decreased progression of atherosclerosis, decreased cerebrovascular events, and decreased death.

Avoiding Burnout: The Personal Health Habits and Wellness Practices of US Surgeons

Shanafelt TD, Oreskovich MR, Dyrbye LN, et al. Ann Surg 2012;255:625-33.

Conclusion: There are specific measures surgeons can take to decrease burnout and improve professional and personal quality of life (QOL).

Summary: A surgical work force to meet societal needs depends on training an adequate number of younger surgeons and also preventing older surgeons from prematurely leaving practice. Exercise and preventative health patterns, alcohol use and dependency, and personal health issues are suggested to influence the length of a surgeon's career (Harms BA et al, Ann Surg 2005;242:520-6). In addition, other studies have suggested depression, low mental QOL, and burnout are common among United States (U.S.) surgeons (Shanafelt TD et al, Ann Surg 2009;250:463-71). Because the self-care strategies and personal wellness practices used by surgeons to deal with the stress of practice have not been well explored, the American College Surgeons Committee on Physician Competence and Health commissioned this study to evaluate personal health habits, personal wellness strategies, and routine medical care practices of surgeons in the U.S. and to explore the associations between these and surgeon burnout and QOL. In October 2010, American College of Surgeons members were sent an anonymous cross-sectional survey that addressed self-assessment of routine medical care practices, health habits, and personal wellness strategies of U.S. surgeons as well as standardized assessments of burnout and QOL. Of the 7,197 surgeons who participated in this survey, 3,911 (55.0%) engaged in aerobic exercise and 2,611 (36.3%) in muscle strengthening activities in patterns consistent with the Centers for Disease Control and Prevention recommendations. Overall, physical QOL scores were superior for surgeons who followed the Centers for Disease Control and Prevention recommendations ($P < .0001$). In the last 12 months, 46.2% of the participating surgeons had seen their primary care provider. Surgeons who had seen their primary care provider in the previous 12 months were more likely to be up-to-date with age-appropriate and sex-appropriate health care screening and had superior overall and physical QOL scores (all $P < .0001$). Of 16 wellness promotion strategies surveyed, ratings of importance differ for surgeons without burnout (all $P < .0001$). Surgeon who placed greater focus on what is important in life, finding meaning in work, embracing a work-life balance strategy, and maintaining a positive outlook were all less likely to be burned out (all $P < .0001$).

Comment: This study suggests that weekly aerobic exercise and weight training, visits to primary care providers, and age-appropriate preventative health evaluations may help decrease the burnout rate of U.S. surgeons. Strategies to maintain surgeons in the work force are important for several reasons. There is a projected decrease of surgeons in the U.S. work force over the next 10 to 20 years, and one strategy to balance fewer surgeons is to keep