

## Abstracts

### Gregory L. Moneta, MD, Section Editor

#### Clinical Outcomes of Carotid Endarterectomy in Patients With Carotid Artery Tandem Lesions



Han Y, Park H, Kwon SU, et al. *Stroke* 2014;45:3443-6.

**Conclusions:** Patients undergoing carotid endarterectomy with the diagnosis of tandem carotid stenosis by contrast-enhanced magnetic resonance angiography have similar rates of stroke and death with and without tandem stenosis.

**Summary:** There have been previous studies evaluating the outcomes of carotid endarterectomy in patients with both intracranial and extracranial carotid artery disease. Most such studies were published more than 15 years ago using intra-arterial digital subtraction angiography for diagnosis of carotid lesions. The authors sought to reevaluate outcomes of carotid endarterectomy in patients with extracranial and combined intracranial carotid artery stenosis in the modern era where the use of noninvasive diagnostic modalities such as Duplex ultrasonography and contrast-enhanced magnetic resonance angiography are primarily used in the planning of carotid endarterectomy. There were 647 consecutive patients who underwent CEA between January 2001 and December 2010. Tandem stenosis, defined as a significant carotid bifurcation stenosis and identifiable stenosis of  $\geq 50\%$  of any downstream distal cerebral artery was identified in 92 patients (14.2%) by contrast enhanced magnetic resonance angiography. Patients with and without tandem stenosis were compared in terms of CEA outcomes. Primary end point was the composite of any stroke, myocardial infarction, or death during the periprocedural period or ipsilateral stroke within 4 years after the CEA. The two groups did not differ in terms of estimated 4-year primary endpoint rates (8.7% vs 3.8%;  $P = .07$ ) for ipsilateral stroke-free ( $P = .56$ ), any stroke-free ( $P = .89$ ), or overall survival ( $P = .41$ ).

**Comment:** The study confirms the frequency with which tandem lesions are observed in patients undergoing CEA (14.2%) and the fact that tandem lesions are not associated with an increased risk of ipsilateral stroke during follow-up after CEA. The only really unique feature of the study is that it is more modern than previous studies and that the diagnosis of intracranial stenosis was made in a different fashion using MRA rather than catheter based contrast angiography.

#### Global Sodium Consumption and Death From Cardiovascular Causes



Mozaffarian D, Fahimi S, Singh GM, et al. *N Engl J Med* 2014;371:624-34.

**Conclusions:** There were 1.65 million deaths from cardiovascular causes in 2010 attributable to sodium consumption above a reference level of 2.0 g per day.

**Summary:** Increased intake of dietary sodium is associated with elevated blood pressure and adverse cardiovascular outcomes (Frieden TR et al, *N Engl J Med* 2011;365:e27). However, global effects of sodium consumption and the effects according to age, sex, and country have not been clearly established. The authors collected data from surveys on sodium intake as determined by urinary excretion and diet in persons from 66 countries (accounting for 74.1% of adults throughout the world). The data was then used to quantify global consumption of sodium according to age, sex, and country. Effects of sodium on blood pressure according to age, race, and the presence or absence of hypertension were calculated from data in a new meta-analysis of 107 randomized interventions, and the effects of blood pressure on cardiovascular mortality, according to age, were calculated from a meta-analysis of cohorts. Cause-specific mortality was then derived from the Global Burden of Disease Study 2010. Using comparative risk assessment an estimate of the cardiovascular effects of current sodium intake as compared with the referenced intake of 2.0 g of sodium per day according to age, sex, and country was determined. In 2010 the estimated mean level of global sodium consumption was 3.95 g per day, and the regional mean levels ranged from 2.18 to 5.51 g per day. Globally, 1.65 million annual deaths from cardiovascular causes (95% uncertainty interval [confidence interval], 1.10 million to 2.22 million) were attributed to sodium intake above the reference level; 61.9% of these deaths occurred in men and 38.1% occurred in women. These deaths accounted for nearly 1 of every 10 deaths from cardiovascular causes (9.5%). Four of every 5 deaths (84.3%) occurred in

low- and middle-income countries and two of every five deaths (40.4%) were premature (before 70 years of age).

**Comment:** The data indicate that no region and few countries are spared from the adverse effect of increased sodium consumption on cardiovascular death. The data, however, depends upon extrapolating the effects of sodium on blood pressure to cardiovascular risks. Although this is not definitively established, the effect on cardiovascular disease from hypertension and the effects of sodium consumption on hypertension are supported by extensive experimental and demographic evidence. A meta-analysis of 37 trials has shown no significant adverse effects on blood lipid levels, catecholamine levels or renal function from decreased sodium consumption (Aburto NJ et al, *BMJ* 2013;346:f1326). Therefore it appears there is nothing to be lost and potentially much to be gained by decreasing sodium consumption for adults to less than 2 g per day.

#### Improved Quality of Life After 1 Year With an Invasive Versus a Noninvasive Treatment Strategy in Claudicants: One-Year Results on the Invasive Revascularization or Not in Intermittent Claudication (IRONIC) Trial



Nordanstig J, Taft C, Hensäter M, et al. *Circulation* 2014;130:939-47.

**Conclusions:** An invasive treatment strategy improves health-related quality of life and intermittent claudication distance after 1 year in patients with stable lifestyle-limiting claudication receiving current medical management.

**Summary:** Patients with intermittent claudication are at increased risk for cardiovascular events, cerebrovascular events and premature death but are at low risk of limb loss. Many claudicants will respond with increased walking distance with exercise training, thus risk factor modification and medical treatment and exercise training are standard and accepted first-line treatments of patients with intermittent claudication (IC). However exercise training under supervision is not often available for many patients and many others are poorly compliant with supervised exercise. Evidence for the effectiveness of invasive treatment for intermittent claudication is relatively sparse. Most studies evaluating invasive treatment have used selective inclusion criteria enrolling patients on the basis of vascular lesions (ie, in specific vessel segments or lesions of certain length and severity with suitable anatomy for endovascular treatment). A long list of exclusion criteria in such studies has made it difficult to generalize results to the majority of patients with intermittent claudication. Based on all of this the authors sought to perform what they term "a real world" study to test the hypothesis that an invasive (surgical or endovascular) treatment strategy compared with continued medical therapy would improve health-related quality of life in relatively unselected IC patients already receiving best medical treatment and structured (nonsupervised) exercise training advice. Patients with intermittent claudication underwent clinical and ultrasound assessment and those requesting treatment for claudication were then randomly assigned to invasive ( $n = 79$ ) or noninvasive ( $n = 79$ ) treatment groups. The primary endpoint was health-related quality of life after 1 year assessed with the Medical Outcomes Study Short Form 36 version 1 and Vascular Quality of Life Questionnaire. Secondary endpoints included walking distance on a graded treadmill. The Medical Outcomes Short Form 36 version 1 physical components and 2 Medical Outcomes Study Short Form 36 version 1 physical subscales improved significantly more in the invasive vs the noninvasive group ( $P < .001$ ). Vascular Quality of Life Questionnaire score ( $P < .01$ ) and 3 of 5 domain scores improved significantly more in the invasive vs the noninvasive group. Intermittent claudication distance improved more in the invasive (+124 m) vs the noninvasive (+50 m) group ( $P = .003$ ). Change in maximum walking distance was not significantly different between groups.

**Comment:** There are several innovative elements in this trial's study design, the primary one of which is to use the health-related quality of life as the primary end point. Most claudication trials have used patency of reconstructions, and treadmill walking distance as primary endpoints in evaluation of treatments for claudication. Benefits in health-related quality of life may include many elements and not just leg symptoms. The concept of patient-centered outcomes is becoming increasingly prevalent in clinical trials. To test the unique approach presented in this trial it also will need to be evaluated in additional studies incorporating longer follow-up and