Abstracts

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Accuracy of a Novel Risk Index Combining Degree of Stenosis of the Carotid Artery and Plaque Surface Echogenicity

Momjiam-Mayor L, Kuzmanovic I, Momjiam S, et al. Stroke 2012;43: 1260-5.

Conclusion: A new ultrasound risk index parallels the presence of symptoms and may be a means of assessing the clinical risk of a carotid plaque.

Summary: Thus far, prophylactic intervention for carotid artery stenosis is determined primarily by the severity of the degree of the stenosis. However, stenosis severity itself in asymptomatic patients is relatively insensitive in determining which patients develop neurologic symptoms. Additional variables, such as plaque morphology, may also play an important role in occurrence of cerebrovascular events and may be predictors of ipsilateral stoke that act independently or in concert with the degree of stenosis. The authors developed an ultrasound risk index (RI) based on the combination of degree of stenosis and echogenicity of the plaque surface. In this study, the aim was to evaluate the accuracy of the RI in a cohort of consecutive patients presenting with symptomatic or asymptomatic carotid stenosis. In addition, the authors wished to compare this method with other well-established parameters, including degree of stenosis alone and gray-scale median of the plaque, for predicting potential neurologic events associated with carotid stenosis. The authors used consecutive patients with 50% to 99% internal carotid stenosis. Semi-automated gray scale-based color mapping (red, yellow, and green) of the whole plaque and of its surface was preformed. The surface was defined as the region located between the lumen (level 0) and, respectively, 0.5, 1, 1.5, and 2 mm below the surface. RI was based on the combination of the degree of stenosis and the proportion of red color (indicating low echogenicity) on the surface or in the whole plaque. There were 67 symptomatic and 117 asymptomatic carotid stenoses analyzed. RI values were higher among symptomatic lesions (0.46 vs 0.29; $P <$ .001). Using receiver operating characteristic curves, RI had stronger predictive value compared with degree of stenosis or surface echogenicity alone. In a regression model that included age, gender, degree of stenosis, surface echogenicity, gray-scale median of the whole plaque, and RI, RI measured within the surface region (0.5 mm from the lumen) was the only parameter significantly associated with the presence of symptoms (odds ratio, 4.89; 95% confidence interval, 2.7-8.7; P = .0000002). RI was also the best criteria to differentiate between symptomatic and asymptomatic stenosis (RI value <0.36, sensitivity 78% and specificity 65%).

Comment: These authors studied many different parameters to predict symptoms associated with carotid plaque, including age, gender, degree of stenosis, surface echogenicity, gray-scale median of the whole plaque, and RI. Of all these parameters, it is intriguing that only RI measured within the surface region located 0.5 mm from the lumen was significantly associated with the presence of symptoms. Unfortunately, the authors' RI, while an intriguing new ultrasound parameter, appears somewhat difficult to calculate, and it is unknown if the data are reproducible among different centers. It is somewhat amazing that after >30 years, it is still only the degree of stenosis of the internal carotid artery that is an accepted parameter for prediction of stroke secondary to internal carotid artery stenosis.

Cardiovascular Benefits and Diabetes Risks of Statin Therapy in Primary Prevention: An Analysis From the JUPITER Trial

Ridker PM, Pradhan A, MacFadyen JG, et al. Lancet 2012;380:565-71

Conclusion: The cardiovascular mortality benefits of statin therapy exceed the potential diabetes hazard induced by statins.

Summary: Recent trial data and meta-analysis have suggested that statins confer an increase risk for development of diabetes (Ridker PM, et al, N Engl J Med 2008;359:2195-207; and Sattar N, et al, Lancet 2010;375: 735-42). Recognition of the increased risk of diabetes with statin therapy has lead to questions on the balance of benefit and risk of statin drugs for primary prevention. The authors, therefore, analyzed data from participants from the JUPITER trial to address the balance of vascular benefits and diabetes hazards with statin use. In the JUPITER trial, 17,603 men and women without previous cardiovascular disease were randomly assigned to rosuvastatin (20 mg/d) or placebo and were monitored for 5 years for the primary end point of myocardial infarction, stroke, admission to the hospital for unstable angina, arterial revascularization, or cardiovascular death. Prespecified secondary end points of the trial included venous thromboembolism, incident of physician-reported diabetes, and all-cause mortality. With respect to diabetes development, patients were stratified on the basis of having none or at least one of the major four risk factors for developing diabetes: metabolic syndrome, impaired fasting glucose, body mass index ≥30 kg/m^2, or glycated hemoglobin A_{1c} >6%. There were 11,508 trial participants with one or more major diabetes risk factors. In individuals with one or more diabetes risk factors, statin allocation was associated with a 39% reduction in the primary end point (hazard ratio [HR], 0.61, 95% confidence interval [CI], 0.47-0.79, P = .0001), a 36% reduction in venous thromboembolism (HR, 0.64; 95% CI, 0.39-1.06; P = .08), a 17% reduction in total mortality (HR, 0.83; 95% CI, 0.64-1.0; P = .15), and a 28% increase in diabetes (HR, 1.28; 95% CI, 1.07-1.54, P = .01). For those with diabetes risk factors, 134 vascular events or deaths were avoided for every 54 new cases of diabetes diagnosed. For trial participants with no major diabetes risk factors, statin allocation was associated with a 52% reduction in the primary end point (HR, 0.48; 95% CI, 0.33-0.68; P = .001), a 53% reduction in venous thromboembolism (HR, 0.47; 95% CI, 0.21-1.03; P = .05), a 22% reduction in total mortality (HR, 0.78l; 95% CI, 0.59-1.03; P = .08), and no increase in diabetes (HR, 0.99; 95% CI, 0.45-2.21; P = .99). In patients without diabetes risk factors, 86 vascular events were avoided, with no new cases of diabetes diagnosed. In the 486 participants in the trial who developed diabetes in the follow-up (270 on rosuvastatin vs 216 on placebo; HR, 1.25, 95% CI, 1.05-1.49; P = .01), the point estimate of cardiovascular risk reduction associated with statin therapy (HR, 0.63; 95% CI, 0.25-1.06) was consistent with that for the trial as a whole (HR, 0.56; 95% CI, 0.46-0.69). Compared with placebo, statin accelerated the average time to diagnosis of diabetes by 5.4 weeks (83.3 [standard deviation, 47.8] weeks on rosuvastatin vs 89.7 [50.4] weeks on placebo).

Comment: Three meta-analyses were published between 2009 and 2011 indicating an increase risk of type 2 diabetes in patients taking a statin medication. In addition, intensive-dose statin therapy appeared to be associated with higher risk than lower-dose therapy (Preiss D, et al, JAMA 2011;305:2556-64). This prompted the Food and Drug Administration to recommend safety label changes to statin drugs (http://www.FDA.gov/drugs/drugsaftey/ucm293101.htm). This report, while confirming the increased risk of diabetes in patients on statin medications, suggests that in the setting of primary prevention, even in the face of risk factors for development of diabetes, the use of statin medications has a favorable overall effect on mortality and cardiovascular events, despite an increased risk of diabetes. The authors believe the data provide reassurance for patients and physicians with regard to lipid-lowering agents as adjuncts to smoking sensation, exercise, and diet in the prevention of major cardiovascular events.

Changes in Abdominal Aortic Aneurysms Rupture and Short-Term Mortality, 1995-2008: A Retrospective Observational Study

Schermerhorn ML, Bensley RP, Giles KA, et al. Ann Surg 2012;256:651-8.

Conclusion: Decreases in mortality from abdominal aortic aneurysm (AAA), both from rupture and short-term repair, are likely related to the introduction and expansion of endovascular aneurysm repair (EVAR).

Summary: EVAR was approved by the U.S. Food and Drug Administration in 1999 and has resulted in lower perioperative mortality and morbidity, as documented in three large randomized trials and in the U.S. Medicare population. Decreased morbidity and mortality associated with EVAR, combined with widespread use of abdominal imaging studies, has resulted in more aneurysms being detected than in the past and more aneurysms being repaired. The authors' hypothesis was that increased rates of detection and elective repair of AAA, in combination with increasing use of EVAR, should be associated with decreased short-term AAA-related mortality. To test their hypothesis, they identified Medicare beneficiaries undergoing elective AAA repair and patients hospitalized with a ruptured AAA (rAAA) from 1995 to 2008. They then calculated standardized annual rates of AAA-related deaths from elective repair or rupture. During the study period, 338,278 patients underwent intact AAA repair, and there were 69,653 patients with rAAA, of whom 47,524 underwent repair. Repairs of intact AAAs increased substantially in those aged >80 years (57.7 to 92.3 per 100,000, P < .001) but decreased in those aged 65 to 74 years (81.8 to 68.9, P < .001). By 2008, 77% of all intact repairs and 31% of all rAAA repairs were performed with EVAR (P < .001). Operative mortality declined for intact repair (4.9% to 2.4%, P < .001) and for rAAA repair (44.1% to 36.3%, P < .001). Short-term AAA-related deaths decreased by more than half (26.1 to 12.1 per 100,000, P < .001), with the greatest decline occurring in those aged >80 years (53.7 to 27.3, P < .001).

Comment: The results presented here parallel those presented earlier this year in the *British Journal of Surgery* (Anjum A, et al. Br J Surg 2012;99:637-45) documenting overall decreasing mortality from AAA. The current study focused primarily on procedurally related deaths. Use of the Medicare database, however, cannot completely dissect all of the factors that may be related to a decrease in AAA mortality. For example, it is certainly