

of patients. The patient population studied was elderly; therefore, the impact of bisoprolol in younger or lower-risk patients undergoing vascular surgery may be less dramatic.

OUTCOMES MEASURED ■ The primary end points were death from cardiac causes or nonfatal myocardial infarction during the perioperative period.

RESULTS ■ The bisoprolol-treated group experienced fewer deaths (3.4% vs 17%, $P=.02$; number needed to treat [NNT]=7.3) and fewer nonfatal MIs (0% vs 17%, $P<.001$; NNT=5.9) than those receiving standard care alone. For the combined end point of death from cardiac causes or nonfatal MI, the overall rate in the bisoprolol group was 3.4% vs 34% in the standard care group ($P<.001$; NNT=3.3). The study was stopped after interim analysis because of the significant difference between groups. Investigators did not report side effects associated with the administration of bisoprolol.

RECOMMENDATIONS FOR CLINICAL PRACTICE

This well-designed clinical trial demonstrates the major impact of perioperative administration of the β -blocker bisoprolol in high-risk patients undergoing vascular surgery. For every 3 high-risk patients treated, one death or nonfatal MI is prevented. It is not known if the benefits associated with bisoprolol will be realized with the use of other β -blockers.

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■ Caffeine Consumption and the Risk of Spontaneous Abortions

• Klebanoff MA, Levine RJ, DerSimonian R, Clemens JD, Wilkins DG. Maternal serum paraxanthine, a caffeine metabolite, and the risk of spontaneous abortion. *N Eng J Med* 1999; 341:1639-44.

CLINICAL QUESTION

Is maternal consumption of caffeine associated with an increased risk of spontaneous abortion?

BACKGROUND ■ Some previous studies have reported a doubling of the risk of fetal loss with caffeine use during pregnancy, some reported a risk only with large amounts of caffeine, and others have not shown any increased risk. Those studies were limited because of small sample size,

suboptimal study design, and reliance on self-reporting for the quantity of caffeine consumed. The authors of this study measured the primary metabolite of caffeine, paraxanthine, to see if it is associated with the risk of spontaneous abortions.

POPULATION STUDIED ■ This study used data from the Collaborative Perinatal Project, a prospective study of pregnancy, labor, and child development at 12 sites in the United States. More than 42,000 women were enrolled, and 55,000 births were tracked between 1959 and 1966. The authors of this study identified 591 women in the cohort who experienced a spontaneous abortion before 140 days' gestation. Each woman with a spontaneous abortion was matched with at least 4 control patients who were from the same site and had serum obtained on the same day of gestation.

STUDY DESIGN AND VALIDITY ■ This was a nested case-control study in which serum paraxanthine levels were measured in 591 women who experienced spontaneous abortions at less than 140 days' gestation and in 2558 matched control patients who gave birth to live infants at 28 weeks' gestation or later. Laboratory personnel were blinded to the outcome of the pregnancy. The women who had spontaneous abortions were different from those in the control group in several ways. They were older, smoked more, and were less likely to have vomited or used medications with caffeine. Serum paraxanthine levels were higher in older women who were white, smokers, and those who did not vomit during pregnancy. Therefore, the odds ratios were adjusted for smoking status, age, and race. Because this was a retrospective case-control study, there is the potential for bias-caused selection of the controls; however, the design is acceptable to answer the question.

OUTCOMES MEASURED ■ The primary outcome was the risk of an early spontaneous abortion (as estimated by the odds ratio) for different serum paraxanthine levels. Patients were divided into 3 groups on the basis of their paraxanthine levels: less than 50 ng/mL, 50 to 1845 ng/mL, and greater than 1845 ng/mL.

RESULTS ■ The women who experienced an early spontaneous abortion had higher mean serum paraxanthine concentrations than the control group (752 ng/mL vs 583 ng/mL, $P<.001$). However, the odds ratio for spontaneous abortion was not significantly elevated at paraxanthine levels of 1845 ng/mL or lower. When the lowest level group (<50 ng/mL) was compared with the highest level group (>1845 ng/mL), the odds ratio indicated a higher risk for the latter group (odds ratio=1.9; 95% confidence interval, 1.2-2.8). This paraxanthine level corresponds to a caffeine intake of 1100 mg, or roughly 11 cups of coffee

per day in a smoker and 6 cups of coffee per day in a nonsmoker.

RECOMMENDATIONS FOR CLINICAL PRACTICE

The authors of this study used a metabolite of caffeine to evaluate the risk of spontaneous abortions from caffeine intake during pregnancy. It has an adequate sample size and does not rely on self-reported caffeine use, which gives it an advantage over previous studies. It does not definitively establish a causal relationship between caffeine and spontaneous abortions but does suggest that if such a relationship exists only very high levels of caffeine pose a threat. With these new data physicians can more confidently discourage high levels of caffeine intake during pregnancy and may tolerate occasional caffeine use in some pregnant patients.

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■ Finger-stick vs Laboratory Serological Testing for *H Pylori* Antibody

• Laine L, Knigge K, Faigel D, et al. Fingersuck *Helicobacter pylori* antibody test: better than laboratory serological testing? *Am J Gastroenterol* 1999; 94:346-7.

CLINICAL QUESTION

How does a new whole-blood *Helicobacter pylori* antibody test compare with quantitative laboratory serology?

BACKGROUND ■ Baseline screening for *H pylori* infection with an antibody test is a widely used, reasonably accurate marker of infection, and may be cost-effective.¹ Serologic tests require venipuncture, followed by a delay as the serum is either sent to a reference laboratory or the sample is prepared for an in-office test. Whole-blood finger-stick antibody tests offer a simple in-office test with more rapid results, but the first generation of tests were less accurate than laboratory serology. A new whole-blood finger-stick antibody test is now available (StatSimple; Saliva Diagnostic Systems; Vancouver, Washington) that may be more desirable because of its ease of use, low cost, and the lack of a requirement for Clinical Laboratory Improvement Amendment (CLIA) certification.

POPULATION STUDIED ■ Study participants were scheduled to undergo endoscopy for clinical indi-

cations. Patients were excluded for being younger than 18 years; having a history of previous treatment for *H pylori*; or having used antibiotics, bismuth-containing medications, omeprazole, or lansoprazole in the previous 4 weeks. A total of 201 patients met the inclusion criteria.

STUDY DESIGN AND VALIDITY ■ All patients had one antral biopsy taken for a rapid urease test and 2 for histologic examination. A finger-stick was performed to obtain 100 µg of blood for the whole-blood antibody test, and venipuncture was performed to obtain serum for a quantitative enzyme-linked immunosorbent assay serologic test. Given the lack of a clear reference standard for a diagnosis of *H pylori*, each antibody test was measured against 2 reference standards. Reference standard 1, the more sensitive one, consisted of having either a positive rapid urease test result or a positive histologic examination result. Reference standard 2 was more specific but less sensitive and required that both biopsy results were positive. Researchers performing each test were blinded to the results of all other tests.

OUTCOMES MEASURED ■ The primary outcomes were the sensitivity and specificity of the whole-blood and quantitative serologic antibody tests.

RESULTS ■ The sensitivities of the whole-blood test and quantitative serology using reference standard 1 (86% vs 92%, $P=.19$) and the gold reference standard 2 (90% vs 94%, $P=.41$) were not significantly different. The whole-blood test had similar or slightly greater specificity than the quantitative serology using reference standard 1 (88% vs 77%, $P=.052$) and the gold standard 2 (79% vs 67%, $P=.048$). The positive and negative likelihood ratios for the whole-blood test using reference standard 2 were 4.3 and 0.1. Given a prevalence of *H pylori* infection of 40% (typical of the primary care setting in the United States), a negative test result reduced that likelihood to 6%, and a positive result increased it to 73%.

RECOMMENDATIONS FOR CLINICAL PRACTICE

New-generation finger-stick whole-blood *H pylori* antibody testing can be simple, inexpensive, and CLIA-exempt, and has a sensitivity and specificity comparable with that of quantitative serologic tests. This test is not useful for following the status of treated patients. Although the authors comment on the finger-stick method being low cost, they did not compare this method with other available diagnostic tests. Other minimally invasive tests are also available. For example, a recent study of a stool immunoassay for *H pylori* antigen showed excellent sensitivity and specificity (>90%), with costs similar to serologic tests.² Stool antigen testing could

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