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Value of Coronary Calcium in Predicting Future Cardiac Events

ABSTRACTS & COMMENTARY

Synopsis: *Physicians should continue to risk-stratify and educate their patients by accepted clinical guidelines. The role of advanced testing techniques such as electron beam computerized tomography will almost certainly be defined over the next several years.*

Sources: Detrano RC, et al. *Circulation* 1999;99:2633-2638; Pitt B, Rubenfire M. *Circulation* 1999;99:2610-2612.

Numerous studies have clearly demonstrated that asymptomatic persons with undesirable risk factors benefit from aggressive risk-factor modification. Recently, noninvasive evaluation of coronary calcium by electron beam computerized tomography (EBCT) has been suggested as an effective new approach to risk stratification, especially in high-risk adults (whether symptomatic or asymptomatic).

Detrano and colleagues from the Harbor-UCLA Medical Center recruited 1196 asymptomatic high-coronary-risk subjects who underwent a complete risk-factor assessment and were then studied with EBCT scanning. Coronary calcium was detected by EBCT in 68% of these subjects who were then followed for 41 months. Detrano et al determined that neither risk-factor assessment nor EBCT calcium detection was an accurate event predictor in high-risk asymptomatic adults. The EBCT calcium score did not add significant incremental information to traditional risk factor assessment and Detrano et al conclude that the use of EBCT in clinical screening was not justified at this time.

COMMENT BY HAROLD L. KARPMAN, MD, FACC, FACP

The Harbor-UCLA EBCT facility was one of the first EBCT laboratories in the country. Therefore, the results of this investigation are extremely important because of the broad experience of this facility in the use of EBCT and because of the high volume of patients that they have seen over the years. The results of this study clearly demonstrate that, in high-risk asymptomatic patients, EBCT coronary calcium scores are essentially equivalent in value to traditional risk-factor assessment in identifying individuals who may eventually suffer coronary death and/or infarction from those who will not. Fur-

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thermore, coronary calcium assessment with EBCT added no prognostic information beyond that obtained by assessment of standard risk factors. Finally, it should be noted that when using the receiver-operated characteristic (ROC) curve areas calculated from the Framington risk factor model, it would appear that both approaches predicted death or infarction with only fair accuracy.

Advances in our understanding of the pathophysiology of coronary artery disease and plaque rupture hold great promise for improving risk stratification even though the present study clearly demonstrates the failure of the EBCT procedure to add value to standard traditional risk assessment techniques used in identifying asymptomatic patients who are at high risk of developing myocardial infarction and/or death. However, it must be recognized that the Detrano study suffered a number of significant limitations and possible biases. The volunteer subjects were predominantly elderly men with a mean age of 66 ± 8 years who were initially recruited knowing that they were at high risk and, in addition, they were also informed of the results of the initial cardiac fluoroscopy and subject EBCT; therefore, it is likely that many of these patients consulted physicians and received aspirin, HMG-CoA reductase inhibitors, diet instructions, advice to discontinue cigarette smoking, and/or were placed on exercise regimens. Knowing their calcium scores undoubtedly resulted in a positive influence in their risk factor modification behavior that might not have occurred in the case in a high-risk voluntary study population who remained ignorant of their EBCT scores.

Despite the shortcomings of this study, it seems reasonable to conclude that the use of routine EBCT to risk-stratify asymptomatic patients whether high risk or low risk for future risk of ischemic events is not currently justified on a clinical basis pending data from future well-designed, prospective clinical research studies to the contrary. On the other hand, there seems to be little question that EBCT will prove to be of value in both the diagnosis and in designing treatment regimens for patients with coronary artery disease but the exact role of this interesting technology is still being defined. For the time being, physicians should continue to risk-stratify and educate their patients by accepted clinical guidelines and the role of advanced testing techniques such as EBCT will almost certainly be defined over the next several years. ❖

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Writing Therapy to Reduce Asthma and RA Symptoms

ABSTRACT & COMMENTARY

Synopsis: *Taking a pen in hand is low cost, noninvasive, personal, and therapeutic.*

Source: Smyth JM, et al. *JAMA* 1999;281:1304-1309.

To determine if writing about stressful life experiences affects disease status in asthma or rheumatoid arthritis (RA) patients using standardized quantitative outcome measures, we conducted a randomized controlled trial between October 1996 and December 1997. A volunteer sample of 112 patients with asthma (n = 61) or RA (n = 51) enrolled; 107 completed the study.

As the intervention, patients were assigned to write either about the most stressful event of their lives (n = 71; 39 asthma, 32 RA) or, as a control, about their plans

for the day (n = 41; 22 asthma, 19 RA).

Asthma patients were evaluated with spirometry and RA patients were examined by a rheumatologist at baseline, and at two weeks, two months, and four months. The evaluations were done blind to the experimental condition.

Of evaluable patients four months after treatment, asthma patients in the experimental group showed improvements in FEV1 (63.9% at baseline to 76.3% at four months; $P < 0.001$); controls showed no change. RA patients showed reduced mean disease severity from 1.65 to 1.19 (28% on a scale of 0 [asymptomatic] to 4 [very severe] at four months; $P = 0.001$); controls showed no change. Combining all completing patients, 33 of 70 (47.1%) experimental patients had clinically relevant improvement; nine of 37 (24.3%) controls also improved ($P = 0.001$).

COMMENT BY JOHN La PUMA, MD, FACP

Every writer knows that writing can be therapeutic, even if it hurts. But only when it hurts?

Smyth and colleagues excluded patients with a defined psychiatric disorder, in psychotherapy, or on mood-altering medications (including prednisone, >10 mg/d). Patients were told that the investigators were interested in the patients' experiences of stress. The patients did not discuss their writing with staff or other participants and wrote in private for 20 minutes on three consecutive days a week after completing baseline disease severity assessments, which were comparable.

Nearly all patients were Caucasian, well-educated (mean two to three years of college), and averaged a mean annual family income of $66K (RA) and $50K (asthma). Nearly all used medication regularly. Less than 10% of each group smoked, and 49% of each group got regular exercise.

Smyth et al report that observation of participants in similar writing sessions shows "considerable emotional upset during the writing sessions." These patients most commonly wrote about the death of a loved one, serious problems of a close other, and problems in relationships.

Not noted was whether and how medication regimens changed over time; to what mechanism physicians attributed patients' assessed improvement; what patients thought of the intervention; or which symptoms specifically improved. Asthma patients' FEV1 ratings improved at two weeks and at each follow-up visit; RA patients' current clinical status assessment did not improve until four months.

Many physicians regularly receive long letters from patients describing household events and personal problems. The possibility of actually prescribing such writing assignments and asking patients to write expressively as part of their chronic disease management is intriguing and refreshing.

Structured, systematic trials assessing the usefulness of expressive writing are a logical, important next research step. Taking a pen in hand is low cost, noninvasive, and personal. Providing a writing tablet and 20 minutes free of other distractions are generous gifts. Prescribed by a caring clinician, the combination seems low risk and potentially therapeutic. (*Dr. La Puma is Adjunct Professor of Nutrition, Kendall College, Director, C.H.E.F. Clinic, C.H.E.F. Skills Research, Alexian Brothers Medical Center, Elk Grove Village, Ill.*) ❖

A Prospective Study of Folate Intake and the Risk of Breast Cancer

ABSTRACT & COMMENTARY

Synopsis: *In women who consumed more than 15 g/d of alcohol from any source, the increased relative risk of breast cancer was reduced if folate intake was 600 g/d.*

Source: Zhang S, et al. *JAMA* 1999;281:1632-1637.

This study used the nurses' health study cohort to test the hypothesis that "higher folate intake might reduce the risk of breast cancer, particularly among women with greater alcohol consumption, which itself moderately increases breast cancer risk." The rationale for this hypothesis is that alcohol is a known folate antagonist and folate is required for DNA repair mechanisms. Therefore, chronic alcohol use might induce a relative folate deficiency and predispose that individual to faulty DNA repair and cancer. Zhang and colleagues were not able to look at these relationships in women known to be at risk for faulty DNA repair mechanisms (i.e., BRCA1 and BRCA2 carriers.) The study methodology is described in exacting detail and is adequate to address the query as posed. The diet information was collected by questionnaire initially in 1980 and then at subsequent timepoints. Higher folate intakes (> 400 g/d) in general did not reduce the risk of invasive breast cancer. Higher folate intakes typically were achieved via daily multivitamin ingestion. In women who consumed more than 15 g/d of alcohol from any source (12 ounces of beer contains 12.8 g; 4 ounces of wine 11.0 g, and 1.5 ounces of spirits 14.0 g), the increased relative risk of breast cancer (RR = 1.24, CI 1.11 - 1.39) was reduced if folate intake was 600 g/d. This relationship held in both premenopausal and postmenopausal women.

COMMENT BY SARAH L. BERGA, MD

No longer is folate the obstetrician's vitamin. Folate is forever! Adequate folate intake is implicated in the chemoprevention of neural tube defects, colorectal cancer, cardiovascular disease, and now breast cancer associated with higher alcohol intakes. Folate takes its name from foliage, as in green leafy vegetables. But the predominant source in most American diets is fortified breakfast cereal and multivitamins. Fortunately, these sources provide a highly bioavailable form of folate, so the strategy of food fortification and multivitamin use in this context appears to be a wise one.[1] Folate from food sources such as orange juice and vegetables is labile (destroyed by food processing and exposure to heat and air). Also, absorption from food can be hindered by other components of the food matrix. Based on this and other similar studies, it makes sense to hedge bets and recommend adequate folate intake, not only to pregnant women and those contemplating conception, but to all women, especially those who drink alcohol regularly.

I wonder how many physicians regularly ask their patients about habits of daily living, such as smoking, alcohol intake, diet in general, vitamin and supplement use in particular, and exercise. There is so much to cover when in the office and so little time. To a great extent, we are dependent on patients to raise issues of importance to them. For example, when a patient asks me about hormones and breast cancer, not only do I tell her that it is unlikely that postmenopausal hormone use is a major promoter of breast cancer, I also use this opportunity to ask about alcohol intake. I explain that small amounts of alcohol are also unlikely to promote breast cancer, but that larger amounts may. However, not all women see a physician on a regular basis. Thus, it also would be a good idea to conduct a campaign to raise the nutrition IQ of doctors and patients alike with the goal of getting us to obtain most of our nutrients from food. Since this strategy is expensive, variably effective, and time-consuming, shortcuts have been advocated and effected. These shortcuts are multivitamin use and food fortification. For certain nutrients, such as folate, vitamin E, and vitamin D, these shortcuts make sense. However, just as it may be unrealistic to expect everyone to get everything they need nutritionally from food, I like to remind patients that it is also unrealistic to expect to get all the nutrients they need from food supplements and multivitamins. There is no substitute for a good diet if for no other reason than the fact that we do not know everything there is in food that we need. Until we get much smarter and can readily individualize nutritional advice, I suggest that the best strategy is to take an inexpensive multivitamin (i.e., one that contains types and amounts of vitamins within the recommended ranges) and eat according to the newest food group pyramid. (*Dr. Berga is Associate Professor, Departments of Obstetrics, Gynecology, Reproductive Sciences, and Psychiatry, University of Pittsburgh.*) ❖

Reference

1. Jacques PF, et al. *N Engl J Med* 1999;340:1449-1454.

PENS for Relief of Low Back Pain

ABSTRACT & COMMENTARY

Synopsis: *In this sham-controlled study, PENS was more effective than TENS or exercise therapy in providing short-term pain relief and improved physical function in patients with long-term LBP.*

Source: Ghoname EA, et al. *JAMA* 1999;281:818-823.

Low back pain (lbp) contributes to considerable disability and lost wages in the United States. Commonly used opioid and nonopioid analgesic drugs produce adverse effects and are of limited long-term benefit in the management of this patient population.

The effectiveness of a novel nonpharmacologic pain therapy, percutaneous electrical nerve stimulation (PENS), was compared to transcutaneous electrical nerve stimulation (TENS) and flexion-extension exercise therapies with long-term LBP. We used a randomized, single-blinded sham-controlled crossover design from 3/97-12/97 in an ambulatory pain management center at a university medical center.

Twenty-nine men and 31 women with LBP from degenerative disk disease of at least three months duration were randomized to four administered therapeutic modalities (sham-PENS, PENS, TENS, and exercise therapies) for 30 minutes three times a week for three weeks, with one week off between therapies. PENS was significantly more effective in decreasing visual analog scale (VAS) pain scores after each treatment than sham-PENS, TENS, and exercise therapies.

After treatment, mean +/- SD VAS scores for pain were 3.4/1.4 for sham PENS, 5.5/1.9 for PENS, 5.6/1.9 for TENS, and 6.4/1.9 for exercise therapy. The average +/- SD daily oral intake of nonopioid analgesics (2.6/1.4 pills daily) was decreased to 1.3/1.0 daily with PENS ($P < 0.008$) compared with 2.5/1.1, 2.2/1.0, and 2.6/1.2 daily with sham-PENS, TENS and exercise, respectively. Com-

pared with the other three modalities, 91% of the patients reported that PENS was the most effective in decreasing their LBP. The PENS therapy was also significantly more effective in improving physical activity, quality of sleep, and sense of well-being ($P < 0.05$ for each). The SF-36 survey confirmed that PENS improved post-treatment function more than sham-PENS, TENS, and exercise.

In this sham-controlled study, PENS was more effective than TENS or exercise therapy in providing short-term pain relief and improved physical function in patients with long-term LBP.

COMMENT BY JOHN La PUMA, MD, FACP

This well-designed Dallas study has some flaws: the exercise prescribed was a simple spine flexion-extension repeated 30 times in 30 minutes; follow-up was limited to 72 hours; patients using opioids for LBP were excluded; how many patients had radiculopathy, if any, is not stated; and a double-blind design was not possible. Overall, its results are impressive in a notoriously difficult-to-treat population, albeit over the short-term.

PENS produced an acute analgesic effect immediately after each treatment, though it took three to four treatments to change their VAS scores for pain, activity, and sleep, and to decrease the consumption of oral analgesics, significantly beating TENS treatment alone.

PENS combines TENS with electroacupuncture to stimulate peripheral sensory nerves at the dermatomal levels corresponding to the local pathology. Ten 32 gauge stainless steel probes were connected to five bipolar leads connected to a small, non-FDA-approved electrical generator. The probes were placed deliberately into soft tissue or muscle from T12 to S2 and were stimulated at a frequency of 4 Hz for 0.5 milliseconds. In contrast, TENS used 4 one-inch cutaneous electrode pads, stimulated at 4 Hz for 0.1 milliseconds.

A recent randomized controlled trial with two-year follow-up comparison of chiropractic, physiotherapy, and an educational booklet for LBP showed approximately equivalent effectiveness.[1] with highest patient satisfaction for chiropractic and least cost for the educational booklet.

A new field of medicine—perhaps called "musculoskeletal medicine"—is emerging from between the cracks of rheumatology, physiatry, orthopedics, sports medicine, and anesthesiology. Physicians seriously interested in these patients approach their diseases from a multimodal rehabilitative perspective rather than a curative one. The main barriers to their success will be the time required to establish a therapeutic alliance.

As part of a multimodal approach to back pain, PENS warrants serious consideration in longer trials to test whether it can improve short- or long-term pain or improve function in a lasting fashion. ❖

Reference

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Pharmacology Update

Rofecoxib Tablets and Oral Suspension (Vioxx—Merck & Co.)

By William T. Elliott, MD, FACP, and James Chan, PharmD, PhD

The cox-2 class of anti-inflammatory/pain relievers now has two entries with the May 21 approval of Merck's rofecoxib (Vioxx). It joins celecoxib (Celebrex—Searle) in this class of "safer" NSAIDs. Selective cyclooxygenase-2 inhibitors reduce inflammation and produce analgesia without inhibiting COX-1 dependent prostaglandins that protect the gastric mucosa and affect platelet aggregation. Thus, these drugs have a much lower propensity to cause endoscopically detected ulcers and do not cause platelet dysfunction. COX-2 inhibitors, however, do have the same effect on renal blood flow as traditional NSAIDs.

Indications

Rofecoxib is approved for the relief of the signs and symptoms of osteoarthritis, for the management of acute pain in adults, and for the treatment of dysmenorrhea.

Dosage

Rofecoxib is available as 12.5 mg or 25 mg tablets and as an oral suspension containing 12.5 mg or 25 mg per 5 mL. The recommended initial dose for osteoarthritis is 12.5 mg once daily. Some patients may achieve added benefit at a dose of 25 mg once daily, which is considered the maximal dose for this indication. The recommended dose for the management of acute pain or the treatment of primary dysmenorrhea is 50 mg once daily. It may be taken without regard to meals.

Rofecoxib should not be taken by patients who have experienced allergic-type reactions to aspirin or other NSAIDs.

Potential Advantages

Rofecoxib, 25 mg or 50 mg daily, has been reported to produce a lower percentage of endoscopic gastroduodenal ulcers than ibuprofen 2400 mg daily. Difference was statistically significant at 12- and 24-week assessments.[1] Rofecoxib also appears to be well tolerated in terms of GI adverse events. In a clinical trial, the percent of patients

experiencing diarrhea was 6.8% vs. 6.5% for placebo, 3.5% vs. 2.7% for dyspepsia, 3.8% vs. 2.8% for epigastric discomfort, and 4.2% vs. 3.6% for heartburn.[1] The metabolism of rofecoxib does not involve the cytochrome P450 enzymes, thus minimizing potential drug interactions. A general enzyme inducer, rifampin, has been reported to produce a 50% decrease in the plasma concentration of rofecoxib.[1] Rofecoxib has no effect on platelet function. Dosages up to 375 mg given daily for up to 12 days did not affect bleeding time relative to placebo.[1]

Potential Disadvantages

Rofecoxib is approved for osteoarthritis but not for rheumatoid arthritis. The renal effects of rofecoxib are similar to those of other NSAIDs.[1] The use of rofecoxib for the relief of pain at the 50 mg dose is not recommended beyond five days.[1] Coadministration of rofecoxib and warfarin have resulted in an increase of 8-11% in INR. Monitoring of INR is recommended with coadministration.[1]

Comments

Rofecoxib is a highly selective inhibitor of COX-2. In vitro studies using Chinese hamster ovary cell lines to express COX-1 and COX-2 showed that at doses up to 1000 mg (20 times the maximum recommended dose) no evidence of COX-1 inhibition was seen.[2]

Refocoxib was approved almost six months after the first COX-2 inhibitor, celecoxib, which was approved on Dec. 31, 1998. Merck took extra time to seek a pain indication for its drug, an indication that celecoxib does not have. In various acute pain models, the analgesic effect of rofecoxib 50 mg was similar to that of naproxen sodium 550 mg to ibuprofen 400 mg.[1,2] In osteoarthritis, rofecoxib (12.5-25 mg) has been reported to be similar in effectiveness as ibuprofen 800 mg tid over six weeks or diclofenac 50 mg tid over six months.[1,4,5] Study patients included patients with osteoarthritis of the hip or knee. Ninety percent had an increase in pain following withdrawal of NSAIDs and 10% had moderate symptoms while taking acetaminophen. Rofecoxib, ibuprofen, and diclofenac all showed about a 50% reduction in the WOMAC (Western Ontario and McMaster Universities osteoarthritis index) visual analog scale walking on a flat surface. This is a composite of pain, stiffness, and functional measures in osteoarthritis. Like celecoxib, rofecoxib (25 mg-50 mg) has been associated with fewer endoscopic ulcers (≥ 3 mm) than ibuprofen (2400 mg daily) (4.1-8.8% vs 27.7-29.2%). This compares favorably to placebo (5.1-9.9%).[1] However, endoscopic ulcers may not be reliable predictors of severe GI events.[7,8]

Merck will likely seek approval of the drug for treating rheumatoid arthritis; however the effective dose, 50 mg, may be associated with higher adverse events.[9] Rofecoxib is priced competitively with celecoxib for osteoarthritis used (12.5-25 mg daily). For pain, rofecoxib is about $5 per day (2 × 25 mg).

Clinical Implications

Osteoarthritis is the most prevalent form of arthritis, and acute pain and dysmenorrhea are common problems. Pharmacologic management of osteoarthritis includes acetaminophen, topical capsacin, other analgesics, and NSAIDs.[6] Gastrointestinal toxicities are problematic with the use of NSAIDs, especially for patients who have a history of gastritis, peptic ulcer disease, or GERD. COX-2 inhibitors are an attempt to find "safer" NSAIDs.

While the frequency of drug-induced endoscopic ulcers appears to be less with rofecoxib, it is not clear if long-term serious events are reduced. In addition, it is not known if there are any deleterious effects with prolonged COX-2 inhibition and how it would affect the homeostasis of other body systems such as the balance of prostacycline and thromboxane in blood vessels.[10] ❖

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CME Questions

1. Which of the following statements is *false*?

a. With sufficient attention to detail, it is possible to select a constellation of food supplements and vitamin pills that ensure adequate nutritional intake in all categories.
b. Folate is essential for DNA repair processes.
c. Alcohol intakes of greater than 15 g daily have been found to be a risk factor for breast cancer.
d. It makes sense to take an inexpensive multivitamin as long as the formulation does not contain excess amounts of vitamins.
e. For certain nutrients like folate and vitamin D, food fortification makes sense.

2. Which of the following is *not* true about refocoxib?

a. It is approved for the treatment of pain.
b. It is approved for the treatment of rheumatoid arthritis.
c. It does not affect platelet function.
d. It's effect on renal blood flow is similar to traditional NSAIDs.

By Louis Kuritzky, MD

Meta-Analysis of Trials Comparing Beta-blockers, Calcium Antagonists, and Nitrates for Stable Angina

Despite many years of use of the three traditional classes of anti-anginal medications, none has emerged as distinctly superior. Because of demonstrated reductions in post-MI mortality with beta-blockers, consensus has generally suggested them as first-line therapy. Since some patients, especially those with bronchospastic lung disease, tolerate calcium channel blockade better than beta blockade, this class of agents also sometimes holds first-choice status. This study analyzed by meta-analysis all randomized trials (1966-1997) of at least one week duration, which compared at least two of the three different drug classes.

Most of the analyzed studies were beta blocker vs. calcium antagonists. Comparing outcomes of cardiac death, MI, angina episodes, use of nitroglycerin, and exercise time, neither class of drug emerged significantly superior. The only statistically significant difference between the classes was in respect to withdrawal for adverse events, for which beta blockers fared more favorably than calcium antagonists.

Studies comparing nitrates with calcium antagonists did not show any significant between-class differences; similarly, although comparisons between beta-blockers and nitrates were the least frequent, no clear advantage of either class emerged.

Since all three classes are equally efficacious, the fact that beta-blockers enjoyed more favorable withdrawal rates suggests that they remain first-choice therapy. ❖

Heidenreich PA, et al. JAMA 1999; 281:1927-1936.

Effect of Cigar Smoking on the Risk of Cardiovascular Disease, COPD, and Cancer in Men

The general public does have the same perceptions about cigar smoking as cigarette smoking in reference to adversities such as COPD and cancer. Between 1993 and 1997, cigar sales increased almost 50%, predominantly due to use by young and middle-aged men. The current study examined the relationship between cigar smoking and cardiovascular disease among persons with no history of current or past cigarette smoking or current pipe smoking.

The population studied included 17,774 men, of whom 1546 were cigar smokers. The entire cohort was followed from 1971-1995. Cigar smokers were at increased relative risk for coronary heart disease and COPD. Cancers of the digestive tract and lung were twice as frequent among cigar smokers. There appears to be a dose-response relationship.

Consumption of large amounts of alcohol had a synergistic effect for relative risk of digestive and oropharyngeal cancer.

Other studies have implicated cigar smoking in a negative light, both in persons with and without preexisting cardiovascular disease. This study, as well as others, have failed to demonstrate a relationship between cigar smoking and cerebrovascular disease. Iribarren and associates conclude that cigar smoking causes substantial increases in COPD and cancer, despite the recent surge in the popularity of this habit. ❖

Iribarren C, et al. N Engl J Med 1999; 340:1773-1780.

Ultrasound Therapy for Calcific Tendinitis of the Shoulder

Although not always symptomatic, calcification of the supraspinatus tendon of the shoulder is characterized by shoulder pain, often with associated rotator cuff dysfunction and limitation of motion. Surgical treatments usually alleviate pain and restore function, but patients will generally opt initially for noninvasive treatments, such as ultrasound.

Small, earlier trials of ultrasound have suggested that such treatment may cause shoulder calcifications to disappear. The purpose of this trial was to assess pulsed ultrasound in a large controlled trial for idiopathic calcific tendinitis.

Sixty-three patients were enrolled over 30 months, each demonstrating discrete radiographic evidence of calcific tendinitis, coupled with shoulder pain or restricted range of motion. Ultrasound treatment (and sham ultrasound = same device, same methodology, but generator turned off) was administered daily on weekdays for 15 minutes for three weeks, then thrice weekly for three weeks. At this level of intensity, sham ultrasound is not distinguishable from active by subjects. Radiographs were obtained at baseline, six weeks, and nine months.

Ultrasound treatment produced calcium deposit resolution in 19% of patients, and reduced calcification by half in 28% (vs 0% and 10% for placebo, respectively). At the post-treatment nine-month radiography, 65% of ultrasound recipients had resolved or reduced calcification, as compared with 20% of placebo recipients.

Ebenbichler and colleagues conclude that ultrasound is beneficial in resolving calcifications of shoulder tendinitis. ❖

Ebenbichler GR, et al. N Engl J Med 1999;340:1533-1538.

ECG with an Echocardiographic Diagnosis

By Ken Grauer, MD

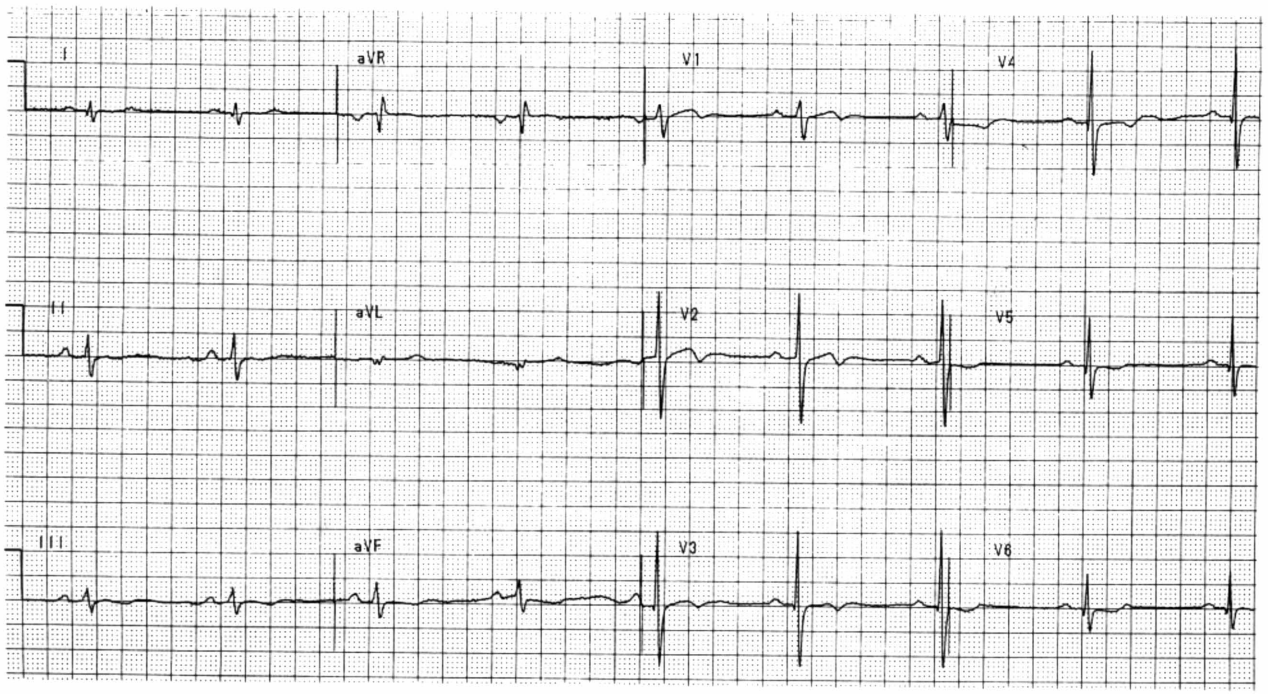

Figure. ECG obtained from a 56-year-old man with increasing fatigue.

Clinical Scenario. The ECG shown in the Figure was obtained from a previously healthy 56-year-old man with a history of gradually progressive fatigue. No chest pain. No history of prior infarction. The patient has never smoked. An echocardiogram was diagnostic and distinctly abnormal. Can you guess what the echo might show?

Interpretation. The rhythm is sinus bradycardia at a rate of 50 beats/minute. All intervals are normal. The mean QRS axis is indeterminate (QRS complexes are nearly equiphasic in all six limb leads). There is no ECG evidence of chamber enlargement. In the precordia leads transition occurs early; small q waves are seen in leads I, aVL, and V_3 through V_6; and there is nonspecific ST segment flattening with shallow T wave inversion in leads V_2 to V_4.

The overall ECG picture is nonspecific in nature. However, in view of the hints provided in the history (the patient was previously healthy, he does not smoke, and has no history of prior infarction)—the early transition with relatively prominent R waves in anterior precordial leads suggests prominent septal forces. The patient had nonobstructive hypertrophic cardiomyopathy with septal hypertrophy that was disproportionately enlarged compared to left ventricular wall thickness (asymmetric septal hypertrophy or ASH). It is likely that the small narrow q waves in leads V_3 through V_6 are also the reflection of prominent septal forces. Although the ECG will usually be abnormal in patients with hypertrophic cardiomyopathy, the changes seen are most often nonspecific and nondiagnostic. This would have been the case here had there not been the hints we have given. ❖

In Future Issues:

Important Factors in the History, Physical, and Routine Chest Radiograph for Diagnosing Pulmonary Embolism