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Elderly Patients with Severe Symptomatic CAD: An Unexplored Population

ABSTRACTS & COMMENTARY

It is well known that older individuals have a higher prevalence of coronary artery disease (CAD), multivessel CAD, as well as CAD morbidity and mortality. Two recent reports provide useful information regarding the management of the elderly with severe symptomatic CAD. An analysis of Medicare patients with unstable angina hospitalized in Connecticut between August and November 1995 demonstrates that patients older than age 65 with unstable angina are often not treated appropriately. This assessment of 5 standard guidelines in unstable angina therapy, defined by the Agency for Healthcare Policy and Research, indicates that physicians underuse proven therapies for unstable angina in older individuals. The parameters assessed included a rapid ECG within 20 minutes of admission; aspirin use on admission and discharge; use of intravenous heparin; and target anticoagulation levels. The highest performance rates were for aspirin, 80% on admission and discharge. However, heparin use was just 60%, and therapeutic anticoagulation at some time within 48 hours was achieved in only 43% of individuals. Only half of the patients had a prompt ECG. Compliance with the unstable angina treatment guidelines varied markedly by hospital, with many institutions below 50% compliance for 1 or more of the 5 variables; the level of performance in 1 area did not correlate with that in others. Women and older subjects (> 85 years of age) were particularly less likely to receive anticoagulation or aspirin. African-American patients also received lower rates of ECG on admission. Individuals with known CAD were more likely to undergo early ECG and receive appropriate anticoagulation, as were patients with ECG repolarization changes and diabetics. Shahi and associates conclude that the significant variation in delivery of care for diagnosis of unstable angina is of great concern in this high-risk population. They point out that their data are concordant with other reports, and that this age group has been particularly underrepresented in the literature. (Shahi CN, et al. *Am Heart J.* 2001;142:263-270).

The trial of invasive vs. medical therapy in elderly patients with

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chronic symptomatic coronary-artery disease (TIME) study from Switzerland is an investigation of patients with severe and/or refractory chest pain aged 75 or older, who were randomized to intensive medical therapy vs. early angiography and revascularization. Most of these subjects would qualify as having unstable angina, although many were outpatients at the time of entry into the study. Approximately 300 subjects, with an average age of 80, were enrolled. At entry, three-quarters of patients had CCS angina class II, and were taking a mean of 2.5 antianginal drugs each. LV function was mildly impaired; ischemia was detected in about half of the patients. The medical group received an increase in the number, as well as dose, of antianginal drugs; antiplatelet and lipid lowering agents were advised. The invasive patients received early angiography, followed by PCI or CABG when appropriate and feasible. The primary end point was a panel of quality-of-life indices, as well as a composite of death, nonfatal MI, and readmission for increasing angina. The patients were followed for 6 months. There were no baseline differences in symptom status or quality of life between the 2 groups. The results indicated that both medically treated and revascularized individuals had an improvement in angina and quality of life, but greater with the invasive strategy. Major adverse cardiac events were substantially less in the invasive group at 6 months, 19% vs. 49% in the optimal medical group, $P = < 0.0001$. There was a trend toward a higher mortality, however, in the invasive patients. Most of the event differences between the 2 cohorts were for repeat hospital admission for ACS. Major events were 40/153 in the invasive patients and 96/148 in the optimal medical strategy group. The latter patients had an increase in intensity of medical therapy, but there was a marked reluctance of treating physicians to use lipid-lowering drugs in these individuals. Specific details regarding the medical treatment are not provided. One third of the optimal medical group ultimately received revascularization for uncontrollable symptoms during follow-up; one quarter of the invasive patients did not undergo revascularization. There were 68 PCI and 25 CABG in this cohort. It was concluded that although there was a slight mortality hazard, related to procedure-related myocardial infarction, the invasive patients overall did much better, and recommend that in appropriate 80-year-old individuals with suitable coronary anatomy, revascularization should be strongly considered. They stress the absence in the literature of randomized trials comparing CABG or PCI to medical therapy in this age group. Nevertheless, the previously reported ACME and RITA-II trials were concordant, demonstrating an improvement in quality-of-life-measures overall in the revascularization cohorts. An accompanying editorial by Aronow emphasizes the paucity of randomized clinical trials in older patients, whether it be unstable angina, acute myocardial infarction, or congestive heart failure. Aronow concludes, ". . . despite their high-risk profile, patients older than 75 should be offered invasive evaluation and coronary revascularization procedures as clinically indicated." (TIME Investigators. *Lancet*. 2001;358:951-957).

COMMENT BY JONATHAN ABRAMS, MD

The Connecticut database indicates that the elderly are underassessed and undertreated when hospitalized for unstable angina. Many of these individuals present with atypical features, and comorbidity is a major problem. The markers of appropriate therapy assessed in "ideal patients" are straightforward, and do not involve high-tech medicine: aspirin and heparin being the major end points. The database represents a therapeutic time period that is somewhat out of date with contemporary treatment of ACS; however, it is unlikely that the experience in the elderly has improved today to include widespread use of IIb/IIIa receptor blockers, low molecular heparin, and clopidogrel. Regarding the Swiss report, at the very least, this small trial strongly supports a policy of coronary angiography in subjects who are considered to be adequate candidates for revascularization, based on

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comorbidity and physiologic function. These details are not provided, although there was a considerable amount of coexisting medical conditions of importance. The improvement in quality of life, without an increased risk, is important, as patients who are 75-85 years of age are surely more interested in feeling better rather than living longer without a substantial burden of symptoms. Other recent ACS trials in younger subjects also confirm that early invasive therapy for hospitalized patients may be more beneficial than medical therapy; although this report does not strictly deal with only hospitalized individuals, the message is concordant—with a significant burden of symptoms and/or ischemia in elderly patients with increasing or unstable angina, careful selection of individuals for invasive evaluation is appropriate. ❖

Arterial Closure Devices vs. Manual Compression

ABSTRACT & COMMENTARY

Synopsis: Vascular complication rates after PCI were higher in patients treated with ACDs than in those receiving manual compression.

Source: Dangas G, et al. *J Am Coll Cardiol*. 2001;38: 638-641.

For many patients undergoing cardiac catheterization or percutaneous coronary intervention (PCI), the most discomfort occurs with removal of vascular access sheaths and during the time spent supine after the completion of the procedure. The vast majority of complications and attendant patient discomfort resulting from these procedures are related to vascular access, most notably hematoma formation, but also bleeding, pseudoaneurysm, and arteriovenous fistula formation. In addition, the time devoted to manual compression, the time spent supine after sheath removal, and, most notably, the time attributed to addressing vascular complications, all contribute to cost and length of stay, both in the cardiac catheterization laboratory proper, and in the hospital prior to discharge. For these reasons, the concept of arteriotomy closure devices (ACDs) holds considerable appeal for patients, invasive cardiologists, and hospital administrators alike, and their use has been rapidly embraced at many institutions performing cardiac catheterization.

All commercially available ACDs have undergone carefully conducted clinical trials prior to FDA approval for clinical use. However, the results of these trials might not reflect the "real-world" experience with the use of these devices. Therefore, Dangas and associates performed a retrospective analysis of 6408 PCI procedures performed at Washington Hospital Center between January 1996 and June 1998, and compared the outcomes of 5892 (92%) cases receiving manual compression with 516 (8%) who were treated with ACDs, at the operator's discretion, after sheath removal. A variety of ACDs were used in this series, but the largest numbers of patients were treated with the Angioseal (Daig, St. Paul, Minn.) n = 371, followed by the Techstar device (Perclose Inc, Redwood City, Calif.) n = 101. Clinical, procedural, and laboratory results, as well as occurrence of major adverse cardiac events (MACE, defined as death, Q-wave MI, need for urgent coronary artery bypass graft surgery, or repeat PCI of target lesion), and vascular complications were obtained from hospital chart review. Univariate and multivariate logistic regression analyses were performed to identify predictors of vascular and hemorrhagic complications.

The patients receiving ACDs were well matched to those treated with manual compression in terms of baseline clinical characteristics, with the exception of prior PCI and prior MI which were both more prevalent in the group receiving ACDs. In terms of procedural variables, the manual compression group exhibited longer total procedure time, higher final and maximal activated clotting time (ACT), and increased rates of debulking device use and balloon angioplasty alone. Rates of non-ST elevation myocradial infarction (NSTEMI) and creatine kinase-MB (CK-MB) elevation > 3 times normal were higher in patients receiving ACDs, but there was no difference in total MACE between the 2 groups. Significant bleeding, defined as a drop in hematocrit (> 15%) was more common in patients receiving ACDs (5.2% vs 2.5%; $P < 0.001$). Vascular complications also occurred more frequently in patients receiving ACDs than in those treated with manual compression. These included hematoma formation (9.3% vs 5.1%; $P < 0.001$), hematoma with significant drop in hematocrit (2.0% vs 0.6%; $P < 0.001$), and need for surgical vascular repair (2.5% vs 1.3%; $P = 0.03$). Due to small sample size, no comparisons could be drawn among the different ACDs used in terms of complication rates. Independent predictors of any vascular complication by multivariate analysis included increasing age, decreasing body surface area (BSA), and female gender. Hematoma and significant bleeding were predicted by use of ACD.

Dangas et al conclude that vascular complication rates after PCI were higher in patients treated with ACDs than in those receiving manual compression. They

acknowledge several limitations of this study including its retrospective, nonrandomized design, nonstandardized criteria for ACD selection and application, and variety of ACDs used. They also point out that this represents a relatively early experience with the use of these devices, with an early "generation" of devices.

■ COMMENT BY SARAH M. VERNON, MD

Pulling sheaths continues to be the bane of many a cardiology fellow's existence. However, the fact remains that many, if not most, complications of cardiac catheterization or PCI occur during and immediately after sheath removal, when the procedure is, in many respects, completed. Thus, from a quality assurance standpoint, it is probably worth considering postprocedural management of the vascular access site to be an essential component of every diagnostic catheterization and PCI procedure. Patient comfort, complication rates, resource use, length-of-stay, and cost should all be considered when deciding whether to use an ACD, or which device to use. This has resulted in a large degree of operator and institutional variability in regards to how patients are managed after invasive cardiac procedures.

In the present study, Dangas et al report an almost two-fold higher incidence of bleeding and vascular complication rates in patients treated with ACDs for sheath removal after PCI, than in those treated with manual compression. Of even more concern is the finding of the increased need for surgical repair (2.5%) in the ACD group, which is several fold higher than generally reported for manual compression. Dangas et al acknowledge several limitations to their study to which I would add, a low rate of glycoprotein IIb-IIIa inhibitor use, lack of information regarding sheath size, and actual time to ambulation. However, despite these many limitations, these data may be more applicable to the average catheterization laboratory than results reported from industry sponsored pre-FDA approval clinical trials, or results from extremely experienced operators or centers with strictly outlined criteria for patient selection.

Interpretation of the published data regarding vascular access site management is a challenge. In a recent editorial, Dr. Zoltan Turi points out many of the pitfalls the reader faces in attempting to interpret the literature in this area. He suggests that, at a minimum, it is important to consider procedural variables such as details of the anticoagulation regimen (including ACTs and use of glycoprotein IIb/IIIa inhibitors), sheath size, and physician learning curves. In addition, he emphasizes the importance of patient related variables such as gender and presence of diabetes. He further suggests that use of preclosure femoral angiography (which is recommended by some device manufacturers, but not others) should be standardized, and assessed for caliber of the femoral artery and location of the arteriotomy, as well as presence of calcification or atherosclerotic disease.[1] In addition, I would suggest that the experience of the operator performing manual compression, the duration of manual hold, time to ambulation, cost, and length of stay should be considered when evaluating the published literature regarding postprocedural vascular access site management.

The recent report by Dangas et al raises serious concerns about the safety of ACDs after PCI. However, the design of these devices continues to evolve and, in fact, has already significantly improved their ease of use. In all likelihood, this will result in improved safety and efficacy of these devices over time. We have much to learn about which patients are likely to benefit most from the use of these devices, as well as those most likely to suffer complications. For this reason, consideration should be given to performing preclosure femoral angiography in all patients who will be treated with ACDs. Despite manufacturer's claims, the actual time spent supine, and time to ambulation and ultimately discharge, as well as cost (which, for the ACD alone can range from $150 to more than $300), will vary among institutions. More importantly, complication rates should be critically evaluated in comparison to manual compression, as well as to the published literature, at every institution electing to use these devices. Lastly, as with any technique in invasive cardiology, the importance of operator experience should not be underestimated. ❖

Reference

1. Turi ZG. *Catheterization and Cardiovascular Interventions.* 2001;53:443-444.

Unstable Angina: New Markers for Prognosis

ABSTRACTS & COMMENTARY

Synopsis: Brain natiuretic peptide and pregnancy-associated plasma protein show promise as a marker for unstable angina prognosis.

Sources: De Lemos J, et al. *N Engl J Med*. 2001; 345:1014-1021; Bayes-Genis A, et al. *N Engl J Med*. 2001;345:1022-1029.

Timi 16, a large, randomized, controlled trial assessing the oral IIb/IIIa inhibitor orbofiban, includ-

ed a sub-study measuring brain (B-type) natriuretic peptide (BNP) at baseline in 2500 individuals hospitalized with an acute coronary syndrome. The study population included patients with MI with and without ST segment elevation, as well as those with unstable angina. The end points included death or nonfatal MI at 30 days and 10 months. Baseline BNP, when adjusted for multiple other factors, including C-reactive protein, was highly predictive of clinical outcomes. Using quartiles of BNP, mortality was strongly related to this neurohormone ($P < 0.001$), and was correlated with a variety of adverse outcomes, including death, new or progressive heart failure, or recurrent MI at 30 days and 10 months. BNP levels were obtained approximately 2 days after hospitalization and before randomization to orbofiban or placebo. De Lemos and associates established a cut-point of 80 pg/mL, and demonstrated that patients with a BNP level < 80 had a substantially more benign prognosis than those with a level > 80 pg/mL ($P = 0.04$). Increasing levels of BNP correlated with worse outcomes, irrespective of a variety of other risk markers, including hs-CRP and ECG changes. De Lemos et al conclude, "these findings suggest that B-type natriuretic peptide should be measured after an acute coronary syndrome in order to identify patients with high and low risk for adverse outcomes and that treatment, including the intensity of surveillance and the use of aggressive pharmacologic interventional therapy, should be adjusted accordingly."

Another report in the same issue of the *New England Journal of Medicine* involves a brand new risk factor, pregnancy-associated plasma protein A (PAPP-A), as a marker for unstable atherosclerotic plaque in individuals with unstable angina. This molecule has previously been identified as an inflammatory component of unstable plaque. This pilot study from the Mayo Clinic attempts to evaluate whether serum levels of PAPP-A can predict clinical outcomes. In addition to examining expression of PAPP-A in culprit plaques in subjects who died suddenly of cardiac cause, they assessed levels of this compound, CRP, and insulin-like growth factor (IGF) in 17 patients with acute MI, 21 with unstable angina, 19 with stable angina, and 13 controls. PAPP-A levels correlated with adverse outcomes in unstable angina and acute MI patients; Bayes-Genis and colleagues conclude that this molecule may be useful as a diagnostic marker for acute coronary syndromes that is "better than C-reactive protein." A threshold PAPP-A level of 10 mIU had an excellent sensitivity and specificity for ACS and "accurately identified patients" with 1 of these syndromes. PAPP-A did not correlate with troponin I and CK-MB levels, indicating that PAPP-A is not produced by necrosis, but rather is an inflammatory marker. The compound is a metallo-proteinase, and generally correlated with levels of CRP. PAPP-A is the enzyme that clears IGF binding protein, although IGF levels were not useful in this report. They conclude, "that PAPP-A is a new candidate marker for the early diagnosis of acute coronary syndromes, and that it can identify patients early in the process of plaque instability."

■ COMMENT BY JONATHAN ABRAMS, MD

PAPP-A is a fascinating discovery, which could turn out to be of importance. Although only a small number of individuals were evaluated, this is a provocative observation that should be vigorously pursued. Information regarding the ease and reproducibility of the assay are not provided. Clearly, future reports will be awaited with great interest. On the other hand, the use of BNP for individuals hospitalized with chest pain demonstrates great promise, based on the report from TIMI 16. This compound has already been shown to have major prognostic implications in congestive heart failure, and is also elevated in acute myocardial infarction. Whether BNP rises and does or does not fall rapidly also has prognostic import. This analysis indicates that BNP might be a highly reliable risk marker in a variety of ACS, including STEMI, NSTEMI, and unstable angina. The cut point of 80 pg/mL is concordant with the experience in congestive heart failure. While a single report cannot change clinical practice, the statistical power and independence of this marker is intriguing, and the fact that commercial assays are now available suggests that BNP assessment in a variety of cardiovascular syndromes, not only congestive heart failure, may become common in the future. Clearly, other data are needed to confirm the TIMI 16 observations. Nevertheless, the independence from troponin I, the ECG, and other clinical factors supports the view that the BNP assay may turn out to be extremely valuable. ❖

Value of Tilt Table Testing in Syncope

ABSTRACT & COMMENTARY

Synopsis: Intermittent bradycardia accounts for many but not all cases of syncope in patients with no or minimal structural heart disease.

Source: Moya A, et al. *Circulation.* 2001;104: 1261-1267.

Moya and colleagues report the results of the multicenter study evaluating the use of

implantable loop recorders (ILRs) and tilt-table testing in patients with syncope of uncertain origin. This report focuses on 2 groups of patients. The isolated syncope group included 82 patients with no or minimal structural heart disease who also had no baseline intraventricular conduction defects and normal tilt-table studies. The tilt-positive group included 29 patients with syncope or near syncope during tilt-table study. All patients had experienced at least 3 episodes of syncope during the previous 2 years and had an interval between the first and last episode of syncope that was longer than 6 months. Prior to enrollment, all patients had undergone a history, physical examination, baseline electrocardiogram, echocardiogram, and 24 hour ambulatory monitoring that did not provide a diagnosis for the patient's syncope. Tilt-table testing was done with either intravenous isoproterenol or sublingual nitroglycerin if the baseline tilt-table study was negative. At the conclusion of these tests, an ILR (Reveal, Medtronic) was implanted subcutaneously. Recordings obtained during each episode of syncope or presyncope during follow-up were retrieved, printed, and analyzed by Moya et al and the diagnosis was confirmed by an events committee. The primary end point of the study was the electrocardiographic findings at the first episode of recurrent syncope. Electrocardiographic findings associated with episodes of presyncope were a secondary finding.

The isolated syncope group and the tilt-positive syncope group had relatively similar clinical characteristics. The mean (± standard deviation) age in the isolated syncope group was 63 ± 17 years vs. 64 ± 15 years in the tilt-positive group. In the tilt-positive group of 29, 21% had syncope during the passive phase, and 79% had syncope during the drug phase. Six patients had an asystolic response, 14 patients had mixed bradycardia and vasodepression, and 9 patients had a pure vasodepressor response during the study.

In the isolated syncope group, an ILR-documented syncopal event occurred in 24 patients after a median follow-up of 105 days. Four additional patients who had syncope were unable to activate the ILR. The actuarial estimates for recurrent syncope were 15%, 34%, and 41% at 3, 9, and 15 months, respectively. The most frequent documented finding at the time of syncope, observed in 11 of 24 patients, was 1 or more prolonged asystolic pauses with a median duration of 31 seconds. Two other patients had severe sinus bradycardia. One patient had syncope related to an ectopic atrial tachycardia. Normal sinus rhythm (9 patients) or sinus tachycardia (1 patient) were seen in the remaining patients.

Presyncope occurred in 19 patients in the isolated syncope group and was documented by the ILR during 20 episodes. Four of the episodes were associated with relative bradycardia, 8 with normal sinus rhythm, 4 with supraventricular tachycardia, and 4 with sinus tachycardia. Three of the patients with presyncope also went on to have syncope.

The results of ILR monitoring in the tilt-positive group were similar to those in the isolated syncope group. A documented syncopal event occurred in 8 of 39 tilt-positive patients after a median of 59 days. Asystolic pauses were associated with syncope in 5 of the 8 patients, 1 patient had sinus bradycardia and 1 had sinus rhythm at the time of the episode. Two additional patients in the tilt-positive group had syncope but were unable to activate the ILR. In the tilt-positive group, the actuarial estimates for recurrent syncope were 25%, 30% and 34% at 3, 9, and 15 months, respectively. The estimates of recurrence for the tilt-positive and the isolated syncope groups were not different. Thirteen episodes of presyncope were documented with ILR tracings in 7 patients in this group. Presyncope was associated with either relative bradycardia (2 episodes), normal sinus rhythm (5 episodes), or a supraventricular arrhythmia (6 episodes).

Moya et al suggest that intermittent bradycardia accounts for many, but not all, cases of syncope in patients with no or minimal structural heart disease. Supraventricular arrhythmias are uncommon and ventricular arrhythmias were not observed. They also conclude that presyncope cannot be used as a surrogate finding in place of true syncopal episodes. Because of these observations, they feel that interventions, including pacemaker therapy, should be postponed until a definite diagnosis can be made. Tilt-table study evaluation was not helpful in these patients.

COMMENT BY JOHN P. DiMARCO, MD, PhD

Recurrent unexplained syncope continues to be one of the more frustrating problems faced by cardiologists. Fifteen years ago tilt-table studies were introduced for the evaluation of patients with unexplained syncope but their value remains controversial. Data presented in this paper suggest that tilt-table studies reveal results that are neither sensitive nor specific in patients with recurrent unexplained syncope. The recurrence rate was the same in both the tilt-negative and tilt-positive groups. The spectrum of cardiac rhythms documented at the time of syncope were also similar in both groups.

It remains puzzling why tilt-table studies are of such limited value in patients with recurrent unexplained syncope. Clearly, observations made during tilt-table studies have been helpful for understanding of the mechanisms and pathophysiology of neurocardiac syncope in gener-

al. Although a tilt-table study can be used to trigger an episode in susceptible individuals, it does not appear to be useful for making a diagnosis or guiding therapy in individual patients.

The patients in this study were relatively old. It is possible that tilt-table studies might be much more helpful in young individuals in whom neurocardiac therapy is more common. However, the data presented here suggest that in older patients, an ILR will provide more useful diagnostic information. It should also be noted that electrophysiologic studies had been performed in 73 of the 111 patients and this may explain the low incidence of tachyarrhythmias noted. ❖

Atrial Thrombi in Atrial Flutter

ABSTRACT & COMMENTARY

Synopsis: Patients with pure atrial flutter do not require anticoagulation prior to ablation or cardioversion, but patients with concomitant paroxysmal atrial fibrillation do.

Source: Schmidt H, et al. *J Am Coll Cardiol*. 2001; 308:778-784.

Current guidelines do not recommend routine anticoagulation prior to cardioversion of atrial flutter.[1] However, the large, randomized, atrial fibrillation trials included some patients with atrial flutter and suggested that they benefited from anticoagulation as well. Also, observational studies have shown left atrial thrombi in patients with atrial flutter and left atrial stunning after cardioversion of atrial flutter. Thus, Schmidt and colleagues from the University of Bonn, Germany, studied 139 patients with atrial flutter undergoing 202 electrophysiologic studies by transesophageal echocardiography. After echocardiography, all patients were put on effective anticoagulation therapy and the electrophysiologic study was performed < 24 h. In 122 patients, radiofrequency catheter ablation was performed; 64 had overdrive suppression, and 16 had electrical cardioversion. Anticoagulation was stopped 24 hours after the procedure, except in 38 of the 69 patients who had a history of paroxysmal atrial fibrillation; in whom coumadin was continued. Also, 11 patients with pure atrial flutter were continued on coumadin for other reasons. The patients were followed for 1 month for subsequent events.

Transesophageal echocardiography demonstrated atrial thrombi in 2 patients (1%). No postprocedure thromboembolic complications were observed. A thrombogenic milieu, as defined by the presence of thrombus or dense spontaneous echo contrast, was found in 15 patients (7%). A left ventricular ejection fraction < 40%, diabetes, and systemic hypertension were significant correlates of a thrombogenic milieu; and all 15 patients had at least 1 of these factors, 10 had 2 of them. Also, 7 of the 15 had an ejection fraction < 40%. In addition, both of the patients with left atrial thrombi identified had heart failure and paroxysmal atrial fibrillation. Schmidt et al concluded that this study supported the current guidelines that patients with pure atrial flutter do not require anticoagulation prior to ablation or cardioversion, but patients with concomitant paroxysmal atrial fibrillation do. Also, in patients with heart failure/poor left ventricular function, diabetes or hypertension, anticoagulation should be considered since these parameters indicate a higher likelihood of atrial thrombi.

COMMENT BY MICHAEL H. CRAWFORD, MD

The role of warfarin anticoagulation in patients with atrial flutter remains controversial. Part of the reason for this is that there are few patients with lone atrial flutter and even fewer studies of them. Even this study, which focused on patients with atrial flutter, was contaminated by paroxysmal atrial fibrillation in about half the patients. Also, patients with atrial flutter often have other problems that predispose them to thromboembolic events such as heart failure. These other factors could not be avoided in this study either. Despite these caveats, left atrial thrombus was rare by transesophageal echo in their patients. Thus, their conclusion that routine anticoagulation for weeks before and after cardioversion is not necessary seems correct and is in agreement with published guidelines.

A key issue is who with atrial flutter should receive standard anticoagulation? Schmidt et al suggest that patients with paroxysmal atrial fibrillation in addition to atrial flutter should. This is an axiomatic conclusion since more than half of their patients in this category were on chronic warfarin therapy, which was continued. They imply that patients with heart failure or ejection fraction < 40% should be since this is a traditional risk factor for thromboemboli and both their patients with left atrial thrombi on echocardiography had heart failure. Although diabetes and hypertension also predicted thrombi or dense spontaneous echo contrast, their high prevalence in the population makes these conditions less useful as indicators for standard anticoagulation. Thus, this study does not adequately address this issue.

This study does demonstrate that a strategy of periprocedure anticoagulation with transesophageal echo guid-

ance for cardioversion or ablation of atrial flutter is safe, as has been shown for atrial fibrillation. However, given the low incidence of thrombi and the complete lack of complications, it could be argued that echo guidance is unnecessary, especially if selected higher risk patients are given standard anticoagulation. Unfortunately, a study of 139 patients is not large enough to make firm conclusions about these alternative strategies. ❖

Reference

1. Lanpacis A, et al. *Chest*. 1998;114:579S-589S.

CME Questions

18. Standard pre- and postcardioversion oral anticoagulation for atrial flutter:
- a. is required.
- b. is required if paroxysmal atrial fibrillation exists.
- c. is required if hypertension exists.
- d. is required if diabetes exists.

19. Patients with severe symptomatic CAD older than 75:
- a. do not benefit from coronary angio/PCI.
- b. have a slightly higher mortality with PCI/CABG.
- c. have less rehospitalization with medical therapy.
- d. are usually given maximal medical therapy.

20. Which of the following new markers are of prognostic value in acute coronary syndromes?
- a. BNP
- b. PAPP-A
- c. hs-CRP
- d. All of the above

21. In older patients with syncope of uncertain origin, an implanted loop recorder:
- a. is inferior to tilt testing.
- b. is superior to tilt testing.
- c. often shows ventricular tachycardia.
- d. often shows supraventricular tachycardia.

22. Arterial closure devices (ACD) vs. manual compression shows:
- a. more major adverse cardiac events with ACDs.
- b. more bleeding with ACDs.
- c. more local vascular complications with ACDs.
- d. b and c

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