Editorial Comment

Non-Q Wave Myocardial Infarction: Identification of High and Low Risk Subsets By Clinical Variables*

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Acute myocardial infarction is now conveniently dichotomized into Q wave and non-Q wave varieties on the basis of presence or absence of pathologic Q waves on the surface electrocardiogram (ECG). The terms transmural, nontransmural and subendocardial infarction have been abandoned since autopsy and experimental studies (1) failed to show a consistent relation between the ECG findings and the intramural location or transmural extent of necrosis. In contrast to Q wave infarction, in non-Q wave infarction, lesser amounts of myocellular necrosis are seen and, when angiography is performed early in the course, the infarct-related artery is less often found to be totally occluded (2,3). Non-Q wave myocardial infarction is a common clinical entity (250,000 annually) accounting for 25,000 deaths a year (4).

Prognosis. In studies performed before the widespread use of thrombolytic, beta-blocking and calcium channel blocking therapy, the in-hospital mortality rate for non-Q wave infarction ranged from 5% to 8% compared with 15% to 20% for Q wave infarction (5). Despite the lower in-hospital mortality rate, the long-term prognosis of non-Q wave and Q wave infarction is similar (6). The relatively adverse late prognosis in non-Q wave infarction is due to a higher incidence of reinfarction. Gibson et al. (6) found that patients with a non-Q wave infarct had a higher rate of reinfarction (18.4% versus 6.5%), of unstable angina (36% versus 22%) and of subsequent bypass surgery or angioplasty (33% versus 19%) than did patients with Q wave

infarction. Marmor et al. (7) reported that during the first 21 days after infarction, the mortality rate was 23% for patients with Q wave infarction and 10% for patients with non-Q wave infarction. However, patients with non-Q wave infarction who had an early reinfarction had a 23% 21 day mortality rate compared with an 8% rate for those without recurrence. Hutter et al. (8) found that 57% of patients with non-Q wave infarction sustained a new infarction in contrast to 12% of patients with anterior wall Q wave infarction and 22% of patients with inferior wall Q wave infarction when follow-up was continued to 54 months. These studies indicate that patients with non-Q wave infarction are at risk for reinfarction both early and late after the acute event.

Identifying the patient at risk. Given the relatively adverse long-term prognosis of non-Q wave infarction, methods of identifying patients at risk are needed. Recurrent chest pain in the hospital is an obvious marker for an adverse prognosis (7). It is reasonable to refer a patient with such pain for coronary angiography in consideration of angioplasty or coronary bypass grafting. Recommendations for patients without recurrent chest pain are more difficult.

Sia et al. (9) demonstrated that early exercise testing can be used to predict the extent and severity of coronary artery disease in survivors of non-Q wave infarction. In this issue of the Journal, Krone and coworkers (10) report on the use of clinical and ECG exercise test criteria in stratifying prognosis among survivors of a first non-Q wave myocardial infarction. The 1 year death rate of 6% and cardiac event rate of 13.5% were similar to rates in other studies involving patients with a first non-Q wave infarction (11,12). Perhaps the most important finding in the study of Krone et al. was the power of the clinical evaluation before exercise testing to identify high and low risk subsets. The presence or absence of clinical or radiographic evidence for pulmonary congestion identified groups with a 1 year cardiac event rate (death or recurrent infarction) of 41% and 12%, respectively. The ability to take the exercise test, angina and ST segment depression during exercise were also predictive of cardiac events at 1 year. However, when the value of exercise testing was examined in the context of the clinical presentation, a different picture emerged. In patients without signs of congestion, failure to take the exercise test was associated with an 18% 1 year event rate. More details on why clinicians did not permit some patients to exercise would be useful. For those patients without congestion who could exercise, the event rate was very low and the ECG exercise test did not add substantially to the prediction of risk. Whether this is a statistical quirk due to the favorable prognosis of a small number of patients or a limitation of ECG stress testing is unknown.

Of the patients with pulmonary congestion, eight did not

exercise and five of these patients had a cardiac event. These are small but seemingly powerful numbers. In patients with pulmonary congestion who could exercise, the ECG stress test was useful. The event rate was 5% in patients without ST depression versus 71% for those with ST depression. Confidence intervals for these estimates of risk should be calculated.

Possible limitations of the study. Another factor that may have contributed to the lack of discriminatory value of the stress test in patients without pulmonary congestion was the timing of the test and the relatively brief follow-up period, especially for reinfarction; 64% of the tests were performed 14 days (range 5 to 57 days) after the index infarction. In 1989, these patients would exceed their diagnosis-related group by 7 days. More importantly, Marmor et al. (13) found that daily cardiac enzyme determinations identified reinfarction occurring an average of 10 to 14 days afer the initial infarction. As noted, early mortality in non-Q wave infarction is closely related to reinfarction. Reinfarction (and mortality?) may have been underestimated in the current study if these events occurred before the low level exercise test. To assess late reinfarction, a longer follow-up period would be of interest in view of the findings of Hutter et al. (8) of ongoing reinfarction and death among survivors of non-Q wave infarction.

Conclusions. Krone and his associates (10) have demonstrated that patients with a first non-Q wave infarction without pulmonary congestion have a favorable 1 year prognosis if they can exercise or are allowed to undergo a low level exercise test relatively late after the index event. The combination of pulmonary congestion and the failure to perform the low level exercise test, or a combination of pulmonary congestion and ST depression on exercise, identifies a group with a highly unfavorable prognosis.

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