ABSTRACTS

822-6
Plasma Levels of the Thrombin-Antithrombin III Complex to Monitor Response to Heparin Treatment in Unstable Angina
Rose Marie Lidon, Pierre Théroux. Montreal Heart Institute, Montreal, Canada.

The facilitating effect of heparin upon the formation of the thrombin-antithrombin III complex (TAT) may be inhibited by circulating factors present in thrombotic states. To evaluate the usefulness of plasma TAT levels to monitor heparin efficiency, 49 consecutive patients hospitalized for unstable angina and TAT determinations before, and daily during heparin administration (5,000 Unit bolus followed by an infusion at a rate of 1,000 Unit/hr adjusted to maintain the activated partial thromboplastin time (APTT) at 1.5-2x control), TAT was measured using microscale technique and a commercially available kit (Diagnostica Stago, France). Repeat angiography and ischemia in hospital occurred in 22 patients and 27 remained symptom-free. Heparin administration initially increased TAT levels by 13.8%, from 24.6 to 28.0 ng/ml in patients with recurrent ischemia and by 9.5% from 22.3 to 25.5 ng/ml in control patients (p<NS). Subsequent daily levels of TAT decreased to 22.0, 24.8, 26.0, 25.8 and 25.0 ng/ml in recurrent ischemia patients (p<0.06 by the ANOVA model with repeated measures with time as covariate), whereas they increased to 24.6, 24.7, 25.3, 28.1 and 28.4 in patients with no recurrent ischemia (p<0.001).

These changes were accompanied by opposite trends in the amount of heparin needed to maintain APTT in the therapeutic range, with significantly more additional heparin needed in patients with recurrent ischemia. Thus, heparin administration resulted in an early decrease in TAT levels in all patients; thereafter, these levels increased progressively in patients responsive to therapy but showed a decrease in patients with subsequent ischemia. The data suggest a state of heparin resistance in unstable angina which progressively dissipates, except in patients with recurrent ischemia. Sequential changes in TAT levels thus may be of use in monitoring disease activity in unstable angina.

823 Myocardial Infarction Triggering Mechanisms
Thursday, March 18, 1993
8:30 AM-10:00 AM
Anaheim Convention Center
B-2

823-1
Beta-Blocker Usage Is Associated With a Reduction in the Post-Awakening Peak of Myocardial Infarction Onset.
Murphy A. Mittleman, Malcolm MacLennan, Jane G. Sherwood, Geoffrey H. Tender, James E. Madsen for the Ostrava Study Investigators. Institute for the Prevention of Cardiovascular Disease, Cardiovascular Division, Department of Medicine, Harvard Medical School, Boston, MA.

MI onset has been well-documented to occur more frequently in the first hour after awakening than at other times of day. The mechanism of this increase is unknown, but, surges in catecholamines, which occur in association with waking and rising, have been postulated to play a role. Previous studies of the effect of beta-blockers on the pattern of MI onset have been limited by small sample size and/or lack of wake-time adjustment.

In the ongoing NHLBI-sponsored MI Onset study we interviewed 885 patients and asked them whether they woke between 0:00 and 3:00 hour of symptoms onset, their wake time on the day of their MI, and the usage of beta blockers. We computed the wake-time adjusted pattern of MI onset in the 181 subjects taking beta-blockers prior to their MI in the pattern in the remainder of the patients.

MI Onset Adjusted for Wake Time

[Graph showing adjusted MI onset]

Beta-blockade was associated with a markedly altered wake-time adjusted pattern of onset (Figures 1 and 2). Peak onset among patients not receiving beta-blockers occurred in the first 3 hours after awakening. Beta-blocker usage was associated with a statistically significant decrease (p<0.01) in this peak in MIs compared to nonusers.

This linking suggests that adrenergic stimuli are important in producing the peak in MI onset following awakening, and that the pathophysiology of MI onset varies at different times of the day.

823-2
Seasonal Periodicity of Acute Myocardial Infarction and Association With Birthdays and Holidays
Alton C. Wilson, Ting Cui, Nataleh M. Cosgrove, John B. Kostis,UMDNJ-Robert Wood Johnson Medical School, New Brunswick, NJ.

Predicting factors and triggering events of acute myocardial infarction (AMI) are not well defined. Circadian rhythm with a peak in the morning and a week cycle with a peak on Monday have been described. Using a large database (118,865 records) for New Jersey AMI hospitalizations, we investigated seasonal fluctuations for the years 1988-00. The differences between the monthly expected and observed number of AMI were determined. Significantly more AMI than expected were recorded in winter than in summer (p<0.0001 by the chi^2 test of goodness of fit). There was a 13% greater risk of AMI hospitalization in the peak month, January, than in July (RR 1.13; 95% CI, 1.09-1.17).

The association of AMI with birthdays and holidays (New Year, Easter, July 4th, Thanksgiving and Christmas) was also examined. Birthdays showed a significant excess from expected AMI compared with days in the surrounding week (p=0.0533) while AMI admissions were consistently higher on the day after holidays (RR 1.27; 95% CI, 1.10-1.46, for combined data excluding Christmas and New Year). These patterns may be explained by physiologic, behavioral and environmental influences, such as alcohol, exercise, psychological and seasonal stress, cold and day length. There may be avoidance of entry to the hospital on the day of public holidays, whereas there is no such reluctance on birthdays.

823-3
Circadian and Seasonal Factors in the Pathogenesis of Acute Myocardial Infarction: The Influence of Environmental Temperature

Seasonal rhythms have been demonstrated in ischemic heart disease with both winter and summer peaks occurring in different climates, but the influence of environmental temperature remains uncertain.

We have analyzed the seasonal variation of acute myocardial infarction (AMI) in 833 consecutive patients over 4 years in a temperate climate (London, UK) with reference to the influence of environmental temperature. The mean age of the patients was 62 years (range: 25 to 94) and 462 were male. There is a significant winter peak and summer trough in incidence of AMI, 30.5% of the total study group presenting in the 3 months from December to February. The data show a higher weekly rate of AMI on colder days (temperature <3.0°C; 4.0°C/week, p<0.001).

To determine if the excess of AMI on colder days reflected a seasonal rather than a temperature effect, the winter months (October to March) and summer months (April to September) were considered separately. The rate of AMI in each of 3 temperature bands for both winter and summer confirm a significantly higher rate of AMI on colder days for both seasons, (winter, p<0.02; summer, p<0.02).

Thus AMI occurs more commonly on colder days in both summer and winter, indicating that environmental temperature may be an important variable in the pathogenesis of AMI.