

What to Look For

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cal period and treatment with anticoagulant drugs and beta-adrenergic-blocking agents) will not set the same criteria as a cardiovascular surgeon. The surgeon who is interested in revascularizing the myocardium by performing an aorto-coronary bypass will consider surgical mortality and post-operative benefits and complications. Still other criteria would be set by investigators who are studying the pathogenesis of the syndrome, or the pathology that can be found at autopsy. The latter is especially valuable when it is correlated with the associated clinical patterns.

The "intermediate syndrome" is generally recognized as coronary insufficiency of a severity intermediate between myocardial infarction and chronic angina pectoris with a consistent pattern. And there has been general agreement that the coronary circulation is insufficient to consistently meet the metabolic needs of the myocardium at rest, although it is generally sufficient so that myocardial infarction does not occur.

However, evidence has accumulated that these neat definitions are not always entirely valid. For example, 20 years ago an autopsy study indicated that when the onset of prolonged or new pain points to an important new occlusion, the development of necrosis depends on both the degree and the duration of myocardial ischemia. The intermediate syndrome, then, may reflect a state of jeopardy that culminates in small or large areas of necrosis when the compromised blood supply can no longer support the vitality of the myocardium.

Syndrome Subgroup Sought

Such necrosis, sometimes called a "silent" infarction, may not cause pain. However, it does produce the delayed rise of serum enzymes in 2 to 11 days, the electrocardiogram changes, the altered cardiodynamics, and other signs that are characteristic of myocardial infarction. Because these changes occur with some frequency, it is necessary to account for them by defining a more serious subgroup of the intermediate syndrome.

One recent report indicated that among 84 patients who had typical prolonged infarction pain, only 26

had moderately elevated serum CPK-MB levels, which presumably were detected because of fortuitous timing of the determinations. However, their ECG patterns showed only S-T depressions or elevations and inverted T-waves. Another team of investigators had previously reported similar elevations of SGOT.

Myocardial Scintigrams as Evidence

The most recent evidence of minor infarctions, presented in several papers published over the past year, came from myocardial scintigrams taken on patients with the intermediate syndrome. In these studies, radioactive agents such as 99M-technetium stannous pyrophosphate, 201-thallium, 43-potassium, 81-rubidium, and 129-caesium were either relatively concentrated or reduced in the infarcted areas and appeared on the scintigraphic image.

Definition and identification of a more seriously threatened subgroup can pay off with a reduced surgical mortality rate. For example, in a study of 111 intermediate syndrome patients who had the same pattern of pain and ECG changes in the S-T segment and T-wave, 16 patients had elevated serum levels of CPK-MB. These 16 patients did not undergo bypass surgery, with the result that operative mortality among the total study group was reduced from the expected figure of more than 10 per cent to an actual death rate of only four per cent. In contrast, in another report, there was 80 per cent mortality in a small series of patients with impending or extending myocardial infarction who were subjected to emergency aorto-coronary bypass without exclusion of those at high risk.

In patients who were followed for long periods, several reports have indicated that sudden death is not infrequent. In one group of 100 patients, 22 died suddenly in one year.

It may be erroneous, then, to assume that "ischemic" ECG changes in T-waves and the S-T segment are benign patterns. Indeed, a number of investigators have noted a tendency toward failure to recognize that these were the only ECG changes in autopsy-proven cases of myocardial infarction with one or more arteries occluded.