associated with competitive sports in the setting of known cardiovascular disease is a controllable factor, and the devastating impact of even infrequent fatal events in the young athletic population justifies appropriate restriction from competition.5

It is noteworthy that a 25-year interval was required to generate the Italian data showing the actual success of the current pre-participation screening program. Until data from other athletic populations of comparable size and follow-up are obtained, the Italian studies provide the best available data which strongly support the need for implementing worldwide screening strategies for prevention of SD in the athletes.

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doi:10.1093/eurheartj/ehi344

Online publish-ahead-of-print 7 November 2006

Incidence, time course, and predictors of early malignant ventricular arrhythmias after non-ST-segment elevation myocardial infarction in patients with early invasive treatment

We read with great interest the recent article by Rahimi et al.1 The authors investigated malignant ventricular arrhythmias requiring defibrillation (VT/VF) in patients with non-ST-elevation myocardial infarction (NSTEMI) and early percutaneous coronary intervention (PCI) (median delay of PCI was 17.5 h). The incidence of VT/VF was 2.6%, more than two-thirds occurred during the first 12 h, with a higher white blood cells count and hypokalaemia as the only predictors.

What about patients with acute ST-segment elevation myocardial infarction (STEMI) within the scope of VT/VF? Primary PCI was introduced in the therapy of those patients as a 24 h service in our center on 1 October 2000. Since then, we treated almost 700 such patients within the first 12 h after the onset of symptoms.2 According to our experience and results, patients with acute STEMI treated with primary PCI have a higher incidence of sustained ventricular tachycardia and ventricular fibrillation than quoted earlier and most of them occurred within the first 12–24 h. The affected myocardial wall, reperfusion achievement, and pain-to-balloon or door-to-balloon have no statistically significant influence on the appearance of malignant ventricular arrhythmias.3 According to the literature, in patients with acute STEMI and successful primary PCI, the only positivity of cardiac troponin T on admission seems to be associated with a higher incidence of VT/VF.4 Patients with STEMI and VT/VF after reperfusion have a higher mortality rate, but the same frequency of other major adverse cardiovascular events in comparison to those without these arrhythmias.3

This issue is very important because it is still hard to predict these life-treating arrhythmias in individual patients with myocardial infarction, especially if good reperfusion is achieved. It still remains uncertain, when considering the pathophysiology of these arrhythmias in patients with myocardial infarction, whether these are really caused by reperfusion (coronary intervention, medicamentous, spontaneous) or ischaemia?5 Further investigations should be directed towards discovering predictors of malignant ventricular arrhythmias after reperfusion in both NSTEMI and STEMI, as well as redefining VT/VF as reperfusion arrhythmias according to pathophysiological and clinical criteria. Finally, we agree that the problem of VT/VF in patients with myocardial infarction and mechanically achieved good reperfusion becomes of lesser significance after the first 24 h, which is important from an economic point of view.

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Incidence, time course, and predictors of early malignant ventricular arrhythmias after non-ST-segment elevation myocardial infarction in patients with early invasive treatment: reply

I would like to thank Professor Nikolic-Heitzler and Dr Babic for their interest in our study. They share their experience, indicating a decreasing rate of malignant arrhythmia in patients with ST-segment elevation myocardial infarction—a fact that they attribute to the wider use of invasive treatment. Indeed, the incidence of malignant arrhythmias seems to have decreased across the whole spectrum of acute coronary syndromes during recent years.1 This trend is likely to be multifactorial in origin. Although the wide use of invasive strategy and early reperfusion is a plausible explanation, equally, effective medical care such as the use of β-blockers is an important determinant.2 Moreover, the shift in epidemiology due to the redefinition of myocardial infarction is unlikely to leave the incidence of early malignant arrhythmias unaffected.

I fully agree with the authors that the prediction of such events, albeit of major scientific and health economic interest, still remains a challenge. As our data suggest, the susceptibility of patients with non-ST-segment elevation myocardial infarction for such events is not explained by factors which have been shown to have good discriminatory power for other acute adverse events. Similarly, a recent meta-analysis2 could not elicit any risk factors for primary ventricular fibrillation other than ST-elevation and time from onset of symptoms, with the latter being a major confounder for other previously reported risk factors. In agreement with the authors, I hope that future studies with inclusion of ‘novel’ biomarkers will help us to understand this complex and life-threatening complication.

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doi:10.1093/eurheartj/ehi345

Online publish-ahead-of-print 7 October 2006

Apical ballooning syndrome, emotional stress and women

In their systematic review, Gianni et al.1 described clinical characteristics of the transient left-ventricular apical ballooning syndrome or takotsubo cardiomyopathy. They found that the disease onset is preceded by emotional stress in 26.8% and physical stress in 37.8% of cases. However, two largest and most comprehensive studies in western populations strongly have pointed toward the striking female predominance, but also toward the importance of emotional stress as a possible external triggering event, observed in 86 and 100% of cases.2,3 In addition, another recent report that has not been included in this review has shown a marked increase in the incidence of apical ballooning syndrome in Niigata, Japan, associated with the earthquake, where 96% of patients were women.4

A similar sex discrepancy in triggering, with a greater likelihood of acute episodes of emotional stress preceding onset in women, has been seen for the acute myocardial infarction.5 Moreover, probably by representing protracted or re-iterated emotional stress, excess in risk of infarction in both sexes is associated with natural catastrophes or stressful mass events such as earthquakes and war threats (e.g. missile attacks), again more prominently among women.6 We have speculated7 that men and women respond differently to emotional stress or that there may be sex-specific pathophysiological mechanisms involved in triggering, as those suggested for apical ballooning syndrome.1,8 Furthermore, we have also previously observed a greater association of emotional stress with non-Q-wave than Q-wave myocardial infarction and proposed that transient vasospasm may be an important triggering mechanism associated with an emotional stress.9 Multiple vasospasm is one of the mechanisms postulated to underlay apical ballooning syndrome.1,4

Gianni et al.9 noted several putative explanations for the sex difference in pathophysiology of triggering of apical ballooning syndrome including sex hormones-related influence on the sympathetic neurohormonal axis and on coronary vasoreactivity, women’s susceptibility to sympathetically mediated myocardial stunning, and post-menopausal alteration of endothelial function. However, further mechanisms may involve a sigmoid interventricular septum or a smaller left-ventricular outflow tract and reduced left-ventricular volumes predominantly found in women. In conclusion, in spite of data from the present review on the more frequent presence of physical stress before the onset of apical ballooning syndrome,1 there is evidence convincingly suggesting the pivotal role of emotional stress in triggering of this disorder that predominantly affects women. Still, the existence of such a phenomenon should be evaluated by controlled data (such as case-crossover methodology10), whereas eventual underlying pathophysiological mechanisms are yet to be fully clarified.

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