



Persistent angina: the good, the bad, and the ugly

Frans C. Visser

VU University Medical Centre, Amsterdam, The Netherlands

Correspondence: Professor F.C. Visser, Department of Cardiology, VU University Medical Centre, Amsterdam, De Boelelaan 1117, 1081 HV The Netherlands
Tel: +31 20 4440123; fax: +31 20 4442446; e-mail: fc.visser@vumc.nl

A major part of our daily clinical practice consists of treating patients with angina pectoris. Angina is the first manifestation of coronary artery disease in a substantial number of patients and, once manifested, it is really a chronic disease. Despite optimal treatment with pharmacological agents and coronary interventions, the majority of patients are not symptom-free and are at risk for future events. Needless to say, because of the large number of patients and the events, the disease has major socioeconomic consequences.

The Editorial Board has therefore again decided to devote an issue of *Heart and Metabolism* to this key topic. In this respect, it is also worthwhile reading Issues 15, 16 and 24, which are available at www.heartandmetabolism.org.

Let me briefly summarize this issue, and convey its messages as 'the good, the bad, and the ugly'.

The good

The first good news, as reported by Brady in the New Therapeutic Approaches article, is that a completely new antianginal drug has been developed and either will be marketed soon or, in some countries, is already available. The new drug is ivabradine, which selectively reduces heart rate, without any other hemodynamic (negative inotropic) effects. Its potency has already been demonstrated in clinical trials, it has a good safety profile, and it will be an important addition to the treatment of angina pectoris.

The antianginal efficacy of trimetazidine is well known, but solid data are now available showing that the drug also improves left ventricular function in patients with ischemic cardiomyopathy. This is highlighted by Kasprzak in the Focus on Vastarel section.

The other good news is that more and more patients undergo percutaneous coronary interventions (PCI) for the treatment of angina, and that drug-eluting stents have dramatically reduced the rates of restenosis. Nevertheless, patients remain at risk for hard events (death and infarction). In the article on Imaging, Giedd shows that nuclear perfusion imaging, stress echocardiography and, possibly, computed tomography angiography have sufficient accuracy – better than the presence of anginal complaints – to predict future cardiac events.

Apart from cardiovascular drugs, the heart itself has also some protective measures to reduce the effects of ischemia. In the Refresher Corner section, Zbinden and Marber describe the interesting phenomenon of warm-up angina, or 'second wind' angina. In recent years, it has become clear that two components may explain this phenomenon: ischemic preconditioning and collateral recruitment. Ischemic preconditioning is clinically important, as it may in part protect the myocardium against stunning and infarction.

The bad

The heart is an aerobic organ, requiring a lot of oxygen for its function. Nevertheless, oxygen can also

generate reactive oxygen species (ROS). These ROS are able to oxidize most of the cellular molecules (including DNA). Under normal conditions, cellular antioxidant systems exist to prevent the occurrence of high concentrations of ROS, but if high concentrations persist (oxidative stress) they may act as one of the primary factors involved in the pathogenesis of several forms of tissue injury, including ischemic heart disease. This important cellular mechanism is clarified in the Basic Article by de Leiris and colleagues.

Another bad thing is that revascularization procedures do not achieve sufficient alleviation of anginal complaints. Large studies have shown that revascularizations fail to eliminate recurrent ischemia in a large proportion of patients, especially those with multivessel disease. Moreover, the reduction of hard events (death and infarction) and improvement of survival by revascularization procedures are also challenged by these studies. Finally, as has also been discussed in Issue 29, we may question the disproportionate use of PCI over coronary artery bypass surgery (CABG) in terms of reduction of anginal complaints and the reduction of future cardiac events. An overview is given by Marzilli in the Main Clinical Article, and a patient is highlighted in his Case Report.

The ugly

The ugly part is the fact that, despite major efforts in lifestyle modification, risk-factor reduction, and pharmacological and revascularization treatments, coronary artery disease remains killer number one. As Marzilli states in his Main Clinical Article, an important factor is that disease progression is a major part of the pathological process. This accounts for the fact that, despite PCI or CABG, the majority of patients have persistent angina (after an initially short period of being symptom-free) and are at risk for infarction or death. Moreover, these data are not so very different from those of patients who are treated medically, especially if we consider the really long-term results. So, until there is a major breakthrough in the treatment of atherosclerosis in general, we will be confronted with a large number of patients who have disabling anginal complaints, together with the inherent low quality of life associated with angina, and who have a decreased life expectancy.

In short, there are a lot of new and interesting data in this issue of *Heart and Metabolism*. Enjoy your reading!