

DEVELOPMENTS IN THE MANAGEMENT OF ACUTE CORONARY SYNDROMES

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Cardiovascular mortality remains one of the leading causes of death across the globe, accounting to a total of 27.15% of deaths in the Maltese Islands for the year 2014.¹ Plaque fissuring and/or plaque erosion constitute the foundations of the pathogenesis of acute coronary syndromes (ACS) ranging from a spectrum of unstable angina, ST elevation myocardial infarction (STEMI) and non-STEMI.²

2015 has been an exceptional year with respect to the progress made in the understanding of ACS. Both the European Society of Cardiology (ESC)³ and the American College of Cardiology/American Heart Association⁴ published new guidelines on the management of ACS in patients without persistent ST-segment elevation. This article aims to highlight some of the major developments and recommendations that have been put forward.

One of the major recommendations by ESC and the American College of Cardiology/American Heart Association is that, following chest pain onset, ACS can be ruled in or ruled out at 0 and 1 hours if a high sensitivity cardiac troponin test is available. Additional testing at 3-6 hours is required if the first 2 troponin measurements are not conclusive and the clinical scenario is still suggestive of ACS. This was also proposed by Reichlin *et al*⁵ who concluded that high sensitivity cardiac troponin T baseline values and absolute changes within the first hour substantially accelerate the management of suspected myocardial infarction (MI) with safe rule-out and accurate rule-in of acute MIs. Another significant finding concerns triglycerides. ESC and the American College of Cardiology/American Heart Association concluded that the relationship of triglycerides to the risk of ACS was independent of LDL-cholesterol. Furthermore, fasting triglycerides predicted long and short term cardiovascular risk. This highlights the role of triglycerides in atherosclerosis, hence pointing out the importance of targeting these in both the prevention and management of ACS.⁶

The role of cardiac magnetic resonance in relation to risk stratification of patients diagnosed with ACS was also studied. Eitel *et al*⁷ stated that this is most important if done within 10 days from the index event in patients with persistent STEMI. Furthermore, microvascular obstruction was the only significant predictor in addition to TIMI risk score to provide prognostic value above clinical risk assessment and left ventricular ejection fraction; hence indicating that microvascular obstruction after successful epicardial recanalization by primary percutaneous coronary intervention (PCI) remains an unmet therapeutic target.⁷

The role of thrombectomy in the management of ACS was another controversial topic discussed in the guidelines. The

Thrombus Aspiration During Percutaneous Coronary Intervention in Acute Myocardial Infarction (TAPAS) study⁸ suggested that the removal of thrombi by manual thrombectomy before coronary stenting has the potential of reducing distal embolization and improving microvascular perfusion hence reducing mortality, whilst improving target vessel revascularisation and MI rates. However, other studies conducted showed that although improvement in ST-segment resolution and distal embolization with thrombectomy were achieved, these did not translate in clinical benefits. In actual fact, these latter studies reported that thrombectomy failed to reduce the development of heart failure or the mortality rate; actually, thrombectomy increased significantly the risk of stroke.^{9,10}

An interesting recommendation was the adoption of a radial approach for coronary angiography and PCI rather than femoral access. It was proven that the use of radial access reduced major bleeding and all-cause mortality whilst not increasing the risk of MI or stroke.¹¹ What is more interesting is that in STEMI patients, repeated cycles of brief inflations of the angioplasty balloon were shown to reduce infarct size and improve the recovery of myocardial contractile function.¹² Another thought-provoking issue is the use of supplemental oxygen in acute MI patients. A study showed that there were no benefits with routine oxygen therapy in uncomplicated normoxic acute MI patients; in actual fact it was found that it increased myocardial injury, increased infarction size on cardiac magnetic resonance, with more recurrent MI and more frequent arrhythmias.¹³ Last but not least, the role of aldosterone in acute MI was also looked into. In fact, there is a surge in aldosterone levels shortly after the onset of MI which has a number of deleterious effects such as sodium retention possibly promoting arrhythmogenesis (in combination with potassium and magnesium depletion), endothelial dysfunction, increased vascular tone and cardiac remodelling amongst others. In the REMINDER study,¹⁴ patients with acute STEMI without a history of heart failure who received epleranone (aldosterone antagonist) within 24 hours of symptom onset fared much better than patients with placebo with regards to mortality, heart failure, sustained ventricular tachycardia or fibrillation, ejection fraction $\leq 40\%$ and elevated pro-BNP.

Given the great complexity and vital importance of the cardiovascular system, this area is undoubtedly one of the most researched and studied to date. New developments and milestones are reached daily, altering our clinical practices with the sole aim of improving morbidity and mortality. Prevention is better than cure and it is with this foresight that the medical profession should ascertain that preventive strategies are promoted in an attempt to prevent a number of cardiovascular pathologies. ❄️

