Updates in the management of coronary disease

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Background

Ischaemic heart disease (IHD) remains the leading cause of death in Australia, accounting for 10% of deaths[1]. In the past decade, there have been enormous advancements in the management of coronary artery disease (CAD), the detection of high-risk coronary plaques using computed tomography (CT) based imaging, biomarkers for identifying high risk individuals, in coronary angioplasty for routine and high-risk procedures, and management of risk factors for secondary prevention. This article will provide a brief update on relevant advances that have and will continue to change management in Australia.

CT based imaging and biomarkers to stratify high risk patients.

Non-invasive imaging methods have changed the environment for detection and management of CAD. CT coronary angiography (CTCA) is an extremely useful tool to detect calcified and non-calcified plaque in patients with intermediate risk chest pain, new left ventricular dysfunction, or exclusion of CAD in patients undergoing non-coronary cardiac surgery. It provides a non-invasive imaging tool, with a relatively low dose of radiation and contrast. With improving clinician skill, artificial intelligence, and better image quality, we are able to detect features of high risk, vulnerable plaque with reasonable confidence. CTCA can also be a useful adjunct for procedural planning, allowing us to interrogate the presence, location, and severity of calcification, and plan an approach to tackle chronic total occlusions (CTO).

Lipoprotein(a) [Lp(a)] is a genetically determined apoB-containing lipoprotein bound apolipoprotein(a) [apo(a)] that consistently appears to be a causal risk factor for CAD, aortic valve calcification and cerebrovascular disease[2, 3]. An MBS item is still not available in Australia, and patients will incur a small out of pocket fee. In Europe and the United States, evaluation with Lp(a) is indicated in patients with premature CAD, elevated coronary artery calcium in the absence of traditional risk factors, aortic valve calcification, and all patients with familial hypercholesterolaemia (FH). It is performed as a one-off measurement (potentially repeated after menopause), and if elevated, patients should be treated as high risk for atherosclerotic cardiovascular disease with close surveillance and more intensive risk factor targets should be implemented.

Pharmacological updates in the management of coronary disease

Dual antiplatelet therapy (DAPT) for 6-12 months following percutaneous coronary interventions (PCI) and acute myocardial infarction (MI) reduces major adverse cardiovascular events (MACE) and has been the mainstay treatment for many years. However, this duration of DAPT therapy has been problematic for our aging and comorbid patients with substantial bleeding risk. In recent years, multiple good quality randomised control trials (RCT) have demonstrated that truncated DAPT therapy (of 1-3 months) reduces major bleeding without increasing MACE or stent thrombosis in selected populations [4].

The recently published REDUCE-AMI trial found that for patients who have been revascularised after an acute MI, who have preserved left ventricular (LV) systolic function, do not benefit as we previously thought from treatment with a beta blocker[5]. This means that a significant proportion of patients will be less burdened with medications after discharge from hospital, and potentially less side effects commonly seen with beta blockers.

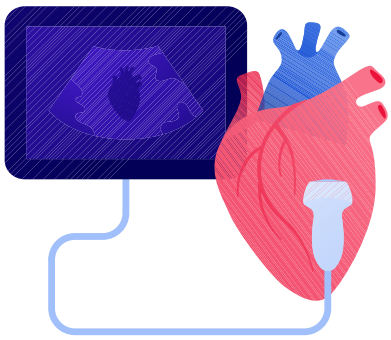
A major advance in secondary prevention for the reduction of LDL-cholesterol (LDL-c) and MACE has been therapeutic targeting of proprotein convertase subtilisin/kexin kind 9 (PCSK9) [6]. PCSK9 inhibitors are subcutaneous injections and when combined with statins, have been shown to reduce LDL-c levels by approximately 60% and cardiovascular events compared to placebo [7]. These are weekly injections and are a useful treatment for; statin intolerant patients, statin failure in patients with high atherosclerotic cardiovascular disease (ASCVD) risk and FH. In the past few months, PBS has added Inclisiran, a small interfering RNA therapeutic that reduces hepatic synthesis of PCSK9 and requires only 6 monthly injections (after a loading dose). In two RCTs, subcutaneous injections of inclisiran (initially day 1 and day 90) every 6 months reduced LDL-c levels by approximately 50% at 17 months, and emerging data indicates a trend towards cardiovascular benefits [8,9]. Icosapent Ethyl, a form of omega-3 fatty acid has shown modest benefit at reducing MACE in patients with hypertriglyceridaemia and risk factors, however, is still not approved in Australia [10]. Bempedoic acid, which acts upstream in the cholesterol biosynthesis pathway inhibiting ATP citrate lyase, has shown promise in patients with and at risk of ASCVD, and those that are statin intolerant [11, 12]. Bempedoic acid has demonstrated to safely reduce CV events by 13% compared with placebo in statin-intolerant patients [12] and will hopefully be listed on the PBS soon.

In the cardiac catheterisation lab

In March 2024, an MBS item was created for the use of intravascular ultrasound (IVUS) during insertion of stents to the left main coronary artery, or lesions that are greater than 28mm to improve procedural and clinical outcomes. This follows on from recent trials demonstrating that the use of intracoronary imaging (IVUS, and optical coherence topography (OCT) improved procedural outcomes, reduced stent thrombosis, and reduced complication rates especially in complex coronary interventions (such as bifurcation stenting) compared with angiography alone [13-15]. There is currently no MBS code for the use of OCT, which provides better image quality at the expense of contrast use for blood clearing.

Conclusion

Whilst there continues to be frequent and exciting advances in technology for the management of coronary disease, individualising medical care and forging a long-term partnership with our patients achieves the best outcomes, improves rates of compliance, and reduces long term morbidity.



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