

Cardiology Symposium 2013: therapeutic and technological advances

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INTRODUCTION

New and emerging technologies were extensively explored in this year's cardiology symposium along with novel approaches to common cardiac challenges. The symposium itself used new technology by webcasting to 12 centres around the world and receiving webcasts from three renowned speakers from the Cleveland Clinic, USA. The sessions included new approaches to commonly encountered cardiology problems, a showcase of recent technological advances via three excellent case presentations and a session on novel interventional techniques for treatment of atrial fibrillation, hypertension and cell therapy, each vying for a mainstream role in future cardiac therapeutics.

SESSION 1: MODERN SOLUTIONS TO BREAD AND BUTTER CARDIOLOGY PROBLEMS

Although cardiology is a specialty that remains at the forefront of research and technological advances, bread and butter conditions are those faced most often by cardiologists and non-cardiologists alike in clinical practice.

Professor Allan Struthers (Professor of Cardiovascular Medicine, Centre for Cardiovascular and Lung Biology, University of Dundee) presented a thorough review on the management of both acute and chronic heart failure based around the recent European Society of Cardiology Guidelines.¹ The management of heart failure with impaired left ventricular ejection fraction (LVEF) has a sound evidence base for both pharmacological and device-based interventions, although there are limited therapeutic options in heart failure with preserved LVEF. Tailored individual treatment and adjuvant interventions, including the involvement of a multidisciplinary team, suitable immunisations and the involvement of palliative care when appropriate, remain integral parts of clinical care.

Dr Andrew Flapan (Consultant Cardiologist, Royal Infirmary of Edinburgh) presented a thought-provoking review on the management of acute chest pain, one of the most common and difficult symptoms to deal with in medicine. The difficulty with the assessment of chest pain lies not only in an accurate diagnosis, but also in understanding and assessing the risk associated with it for the patient experiencing the symptom. The diagnosis and the assessment of risk should determine the management strategy assigned to the patient. An important take-home message was the danger in over-reliance on protocols, guidelines and investigations such as cardiac troponin, rather than relying on an accurate history and application of common sense.

Syncope is another common cardiology symptom associated with enormous difficulty in diagnosis and with considerable healthcare cost. Dr Neil Sulke (Consultant Cardiologist, Eastbourne District General Hospital) reiterated the importance of a thorough history being the most cost-effective intervention in the assessment of syncope. Dr Sulke presented data demonstrating that the immediate implantation of an implantable loop recorder (ILR) at the time of a second episode of unexplained syncope reduced the time to a diagnosis and increased the number of patients diagnosed with a cause for syncope.² He presented unpublished data suggesting that routine implantation of a second generation ILR significantly improved the measured outcomes but it has yet to be confirmed as cost-effective.

SESSION 2: SHOWCASE OF TECHNOLOGICAL ADVANCES IN CARDIOLOGY

Dr Philip Adamson (Interventional Cardiology Fellow, Royal Infirmary of Edinburgh) presented a case-based discussion of transcatheter aortic valve implantation (TAVI). The TAVI programme in Scotland had been recently successfully implemented at the Royal Infirmary Hospital, Edinburgh. It is increasingly becoming an

important procedure in patients requiring aortic valve intervention, in whom age and comorbid conditions would preclude a conventional surgical procedure. The PARTNER B trial demonstrated a significant reduction in mortality when TAVI was performed in these patients compared with medical therapy alone.³ Dr Adamson's presentation highlighted the importance of multi-modality imaging prior to undertaking the procedure, and the essential involvement of the multidisciplinary team in both the assessment of patient suitability and in performing the intervention.

Dr Colette Jackson (SpR, Western Infirmary and Golden Jubilee National Hospital, Glasgow) outlined the use of pump-support devices in the management of acute heart failure. Although use of the intra-aortic balloon pump is now quite commonplace in most tertiary centres, Dr Jackson reviewed the indications and use of advanced devices, including extracorporeal membrane oxygenation (ECMO) and left ventricular assist devices (LVAD). Short-term LVAD, usually used for up to one month, can be used as a bridge to recovery or to further decision-making such as cardiac transplantation. Long-term LVAD is generally reserved for those requiring a bridge to cardiac transplantation.

Renal denervation therapy is a novel invasive intervention for resistant hypertension that has generated significant enthusiasm and hope among some cardiologists, albeit with a limited evidence base to support its use. Dr George Thomas (Cleveland Clinic, USA) and Dr Fayaz Khan (SpR, Ninewells Hospital, Dundee) reviewed the current evidence for renal denervation therapy. The procedure involves the application of radiofrequency energy to the renal nerves situated in the adventitia of the renal arteries. The SYMPPLICITY 2 trial⁴ demonstrated an average fall in systolic pressure of 32 mmHg in the interventional arm at six months, which was maintained at 30 months follow-up. Although these results look very promising, the trial only included 100 patients, with a single office measurement of blood pressure used in follow-up. Ambulatory blood pressure monitoring post-procedure was performed in a minority of patients and demonstrated a mean reduction in systolic blood pressure of only 11 mmHg. Further studies are required with larger numbers of patients, to determine both efficacy and longer-term safety of this procedure.

SESSION 3: STATE-OF-THE-ART CARDIAC INTERVENTIONS

The Stanley Davidson Lecture delivered by Professor David Newby (BHF John Wheatley Chair of Cardiology, University/BHF Centre for Cardiovascular Science, University of Edinburgh) elegantly described the evolution of cardiovascular imaging over the past 100 years. Echocardiography remains an important cornerstone in cardiac imaging, with recent advances including tissue Doppler imaging, speckled tracking and

3D imaging, particularly useful in the diagnosis and management of structural heart disease (see review on pages 139–45). Cardiac magnetic resonance imaging (MRI) is finding an increasing role, particularly given the ability to provide detailed information on both structure and function of the heart. Similarly, computed tomography (CT) imaging is able to provide a non-invasive assessment of cardiac structure, with an increasing role in the assessment of coronary plaque burden and luminal stenosis. Of most interest was the use of a novel tracer in positron emission tomography (PET) imaging, aimed at identification of the vulnerable coronary plaque.

Dr Nick Mills (Edinburgh Heart Centre, University of Edinburgh) discussed the use of newer generation cardiac troponin in the context of the recent update on the universal definition of myocardial infarction (MI). Although the newer high-sensitive assays do result in improved diagnostic accuracy, it is at the cost of specificity. The need for sex-specific diagnostic thresholds for the newer assays was highlighted, with recent data demonstrating that this could result in a significant increase in the identification of MI in women using the new gender-specific reference range.⁵ The key question posed by Dr Mills is whether this could result in better treatment and outcomes for women experiencing acute coronary syndrome. A large trial is currently under way.

SESSION 4: STATE-OF-THE-ART CARDIOLOGY (FROM CLEVELAND CLINIC, USA)

Atrial fibrillation (AF) is the most common sustained arrhythmia, estimated to affect 1% of the population, preferentially the elderly. Dr Bruce Lindsay (Consultant Cardiologist, Cleveland Clinic, USA) discussed ablation techniques, namely pulmonary vein ablation, for the treatment of AF. The efficacy of radiofrequency ablation depends on the nature of AF, with treatment for paroxysmal AF having higher success than for persistent or chronic AF. Although ablation in the select patient is more effective than anti-arrhythmic therapy, a significant number of patients will require a second procedure. There is also a trend for the recurrence of AF over time, thus it should be stressed that ablation treatment should not be targeted at stopping the patients' anticoagulation therapy, which typically needs to be continued despite clinically successful ablation.

Dr Stephen Ellis (Consultant Cardiologist, Cleveland Clinic, USA) discussed the novel area of regenerative therapies after MI. It has been previously thought that the heart is a terminally differentiated organ, but recent evidence suggests this may not be the case with small numbers of actively dividing cells present in normal hearts and following MI.

There are now a number of small studies suggesting a relatively small benefit (3–4% increase in ejection

fraction) resulting from injection of bone marrow mononuclear cells at the site of injury or into the coronary artery following acute MI. There is also some evidence that cardiac-differentiated cells derived from endomyocardial biopsy or stem cells derived from adipose tissue derived cells infused to the site of injury result in reduction in infarct size. While small trials are promising, larger numbers of patients in much larger trials are now required.

TAKE-HOME MESSAGE

The symposium delivered an important combination of updates on common cardiology problems, an insight into technological advances in the field and introduced novel

techniques, diagnostic tools and management strategies. Although emerging therapeutic techniques generate significant interest, the speakers made it clear that we all need to continue to focus on the existing cardiology evidence base of drugs and devices to support diagnosis and management of cardiac patients. Ongoing professional development continues to be essential for all clinicians in maintaining contact with updates in the management of day-to-day cardiology problems, as well as providing exposure to emerging therapies available at specialist cardiac centres. This symposium offered an excellent opportunity to learn a few new tricks and stay updated on a few old ones.

REFERENCES

- 1 McMurray JJ, Adamopoulos S, Anker D et al. ESC guidelines for the diagnosis and treatment of acute and chronic heart failure 2012. *Eur Heart J* 2012; 33:1787–847. <http://dx.doi.org/10.1093/eurheartj/ehs104>
- 2 Farwell DJ, Freemantle N, Sulke AN. Use of implantable loop recorders in the diagnosis and management of syncope. *Eur Heart J* 2004; 25:1257–63. <http://dx.doi.org/10.1016/j.ehj.2004.03.010>
- 3 Leon MB, Smith CR, Mack M et al. Transcatheter aortic valve implantation for aortic stenosis in patients who cannot undergo surgery. *New Engl J Med* 2010; 363:1597–607. <http://dx.doi.org/10.1056/NEJMoa1008232>
- 4 Esler MD, Krum H, Sobotka PA et al. Renal sympathetic denervation in patients with treatment-resistant hypertension (The Symplicity HTN-2 trial): a randomised controlled trial. *Lancet* 2010; 376:1903–9. [http://dx.doi.org/10.1016/S0140-6736\(10\)62039-9](http://dx.doi.org/10.1016/S0140-6736(10)62039-9)
- 5 Mills N, Shah A, Griffiths M et al. High-sensitivity cardiac troponin and the under diagnosis of myocardial infarction in women. *European Society of Cardiology Congress 2013*: abstract.