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Abbreviations used in this review:

ACE = angiotensin converting enzyme; AF = atrial fibrillation; ANH = apnoea-hypopnoea index; AI = artificial intelligence; ARB = angiotensin receptor blocker; ARNI = angiotensin receptor nephrilisin inhibitor; AUCPR/AUROC = area under the precision recall/receiver-operating characteristic curve; CV = cardiovascular; EF = ejection fraction; HF = heart failure; HFPEF/HFREF = HF with preserved/reduced EF; ILR = implantable loop recorder; PVC = premature ventricular contraction; OSA = obstructive sleep apnoea; QALY = quality-adjusted life-year.

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Welcome to this review of the CSANZ (Cardiac Society of Australia and New Zealand) Annual Scientific Meeting 2018, held in August at the Brisbane Conference Centre. This review provides summaries with commentary of ten key abstracts from the meeting, covering a range of topics and includes some important local data. These begin with a comparison of the characteristics and outcomes of patients with HFPEF vs. HFREF from the VCOR (Victorian Cardiac Outcomes Registry), and the impact of a nurse-led, pharmacist-facilitated outpatient HF programme. Other abstracts looked at the relationship between OSA (obstructive sleep apnoea) and AF, and the use of an AI (artificial intelligence) to calculate aortic valve area in aortic stenosis. To conclude, we have included a couple of interesting post hoc analyses of data from large clinical trials.

We hope you enjoy this coverage of 2018’s CSANZ meeting, and we invite you to send any feedback or comments you have.

Kind Regards,

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Characteristics and clinical outcomes in patients with heart failure with preserved ejection fraction compared with heart failure with reduced ejection fraction

Authors: Tan C et al.

Summary: This abstract reported an analysis of the characteristics and clinical outcomes of 1357 patients with HFPEF versus those with HFREF enrolled in the VCOR Heart Failure Module. The aim was to provide a better understanding of how treatment and outcomes are influenced by HF type. Patients in the HFPEF group were more likely to be older, female and have diabetes, hypertension, chronic obstructive pulmonary disease or chronic kidney disease, whereas those with HFREF were more likely to have ischaemic heart disease with a history of MI, percutaneous coronary intervention or cardiac bypass surgery. Compared with patients with HFPEF, patients with HFREF had a higher 30-day all-cause mortality rate (10.2% vs 6.2%) and a lower 30-day readmission rate (22.1% vs. 29.1%).

Reference: Heart Lung Circ 2018;27(Suppl 2):abstract 0093

Abstract

Combining forces: nurse practitioner and clinical pharmacist led heart failure clinic and its impact on titration rates and hospital readmission

Authors: Rheatu H et al.

Summary: This retrospective clinical audit looked at medication titration and readmission rates for 148 men and 54 women who attended a nurse-led, pharmacist-facilitated HF clinic during the 2016–2018 period. The clinic increased the proportion of patients titrated to target ACE inhibitor, ARNI and ARB doses from 57.6% at initial consult to 77.5% at discharge, and the proportion titrated to target β-blocker doses from 28.2% to 41.65%, among patients with HFREF (n=157). The overall 28-day and 3-month readmission rates were 5% and 7.9%, respectively. The 28-day readmission rate among 22 patients who declined the clinic was 18%, similar to the national rate of 20%.

Comment: Over the years, there has been a recognition that community-based HF programmes have resulted in better quality of life and reduced admission rates in patients with HFREF. Despite best intentions, uptitration rates of renin angiotensin inhibitors and β-blockers is far less than ideal in community-based practice, so a nurse- and pharmacist-based up titration programme under supervision has tremendous appeal. This abstract suggests that this approach is beneficial with a reduction in 28-day readmission rates for HF, and thus should be considered as a part of an integrated HF management programme.

Reference: Heart Lung Circ 2018;27(Suppl 2):abstract 0099

Abstract
Reduction in mortality from implantable cardioverter defibrillators in non-ischaemic cardiomyopathy patients is dependent on the presence of left ventricular scar

Authors: Gutman S et al.

Summary: The impact of LV scar on the mortality benefit associated with primary prevention ICDs in nonischaemic cardiomyopathy was assessed in 452 consecutive patients with HF (New York Heart Association class II/III), nonischaemic cardiomyopathy and LV EF ≤35% from a state-wide cardiac MRI service. Over median follow-up of 37.9 months, no difference was seen between patients who had a primary prevention ICD implanted and those who didn’t for HF mortality risk as assessed by MAGGIC score (19.30 vs. 18.90 [p=0.50]), with no difference in mortality risk also seen in the subgroup without LV scar (hazard ratio 1.22 [95% CI 0.53–2.78]), but a significantly lower risk in those with LV scar (0.45 [0.26–0.77]).

Comment: This interesting paper was a candidate for the Ralph Reader Prize. Recent studies have suggested that patients with nonischaemic cardiomyopathy do not derive the same mortality benefit from ICD implantation as compared with patients who have ischaemic cardiomyopathy. Myocardial fibrosis is thought to be the substrate for ventricular arrhythmias, and in this study if myocardial fibrosis was present, mortality was improved with ICD implantation, whereas patients without any evidence of myocardial scar did not derive any benefit. Although the numbers are small, this is highly suggestive, and there is a larger ongoing clinical trial exploring this in a randomised fashion that should answer this question definitively.

Reference: Heart Lung Circ 2018;27(Suppl 2):abstract 0006

The prognostic importance of myocardial fibrosis detected by late-gadolinium enhancement cardiovascular magnetic resonance in new-presentation dilated cardiomyopathy

Authors: Sree Raman K et al.

Summary: This study of 49 consecutive evaluable patients with a new diagnosis of dilated cardiomyopathy sought to determine whether the extent of myocardial fibrosis on late-gadolinium enhancement CV magnetic resonance at presentation independently predicted long-term major adverse CV events (cardiac-related death, rehospitalisation for HF or sustained ventricular arrhythmia) over median follow-up of 8.5 years. CV magnetic resonance positivity was independently associated with increased likelihoods of major adverse CV events (hazard ratio 3.22 [95% CI 1.44–7.21]) and HF rehospitalisation (3.07 [1.24–7.59]); these associations remained significant in Kaplan-Meier survival analyses.

Comment: This paper is complementary to the previous abstract and showed that the presence of myocardial fibrosis on CV magnetic resonance was an independent predictor of subsequent clinical events in patients who had newly diagnosed nonischaemic cardiomyopathy. Taken together these data suggest that myocardial fibrosis is the substrate for ventricular arrhythmias and that CV magnetic resonance may ultimately be used to determine patients with nonischaemic cardiomyopathy who would benefit from ICD implantation.

Reference: Heart Lung Circ 2018;27(Suppl 2):abstract 0013

Cardiology Practice Review

SUBSCRIBE free, click here to visit www.researchreview.com.au and update your subscription to receive Cardiology Practice Review.
Cost-effectiveness of long-term continuous monitoring with an insertable cardiac monitor to detect atrial fibrillation in patients with cryptogenic stroke: an Australian payer perspective

Authors: Thijs V et al.

Summary: A lifetime Markov model was developed and used to determine if long-term continuous monitoring with an ILR (implantable loop recorder, or insertable cardiac monitor) is a cost-effective means of preventing recurrent stroke in patients with cryptogenic stroke. Long-term continuous monitoring with an ILR was compared with monitoring by conventional care. A linked evidence approach provided estimates of recurrent stroke rates when initiation of oral anticoagulation is triggered by AF detection using ILR versus usual care. Uncertainty according to CHADS score and the treatment effect of oral anticoagulation were also evaluated. In a base-case analysis, it was predicted that there would be an incremental cost-effectiveness ratio of AUD$29,570 per QALY. The incremental cost-effectiveness ratios ranged between $26,342 and $42,967 per QALY for CHADS, scores of 6 and 2, respectively. The likelihoods that the ILR strategy would be cost-effective at thresholds of $30,000 and $50,000 per QALY were 53.4% and 78.7%, respectively.

Comment: Patients with cryptogenic stroke or embolic stroke of unknown source represent a difficult population to treat. Recent studies with the nonvitamin K oral anticoagulants have shown that anticoagulation does not reduce the risk of recurrent stroke in general, indicating that a more selective approach may be appropriate. This study would suggest that implementation of an ILR to try and detect AF is a cost-effective strategy as it is clear that some patients with this still have AF, but it must be that many patients who have this condition do not have an atrial arrhythmia that would benefit from anticoagulation, which indicates a treatment and investigational gap.

Reference: Heart Lung Circ 2018;27(Suppl 2):abstract 0259

Prevalence of obstructive sleep apnoea in atrial fibrillation ablation patients: relationship with the atrial fibrillation phenotype

Authors: Nalliah C et al.

Summary: In this study, 268 consecutive patients who underwent AF ablation were evaluated for OSA; 34%, 25.5% and 23.3% were found to have mild (AHI [apnoea-hypopnoea index] 5–15), moderate (AHI 15–30) and severe (AHI >30) OSA, respectively. Patients with persistent AF had a higher AHI than those with paroxysmal AF (22.2 vs. 11.8 [p<0.001]), with a strong association between persistent AF and OSA severity; each 5-unit increase in AHI was associated with a 17% increased risk of persistent AF (p<0.001), with a 21% increase in risk after adjustment for age, sex and BMI.

Comment: Although OSA is a known trigger for AF and reduces the success rate of ablation, it is often not recognised or treated in patients who present with AF. This study shows that the prevalence of OSA is high in patients with AF, and the worse the apnoea, the greater the likelihood of persistent AF. Thus OSA screening should be considered (mandatory?) in all patients being evaluated for AF ablation, and if detected to improve success rates.

Reference: Heart Lung Circ 2018;27(Suppl 2):abstract 0319

Reversibility of frequent premature ventricular contraction induced cardiomyopathy after radiofrequency catheter ablation

Authors: Sethwala A et al.

Summary: These authors analysed retrospective data from seven patients with PVC who had undergone radiofrequency catheter ablation at an Australian tertiary care centre over the most recent 3-year period to evaluate subsequent changes in EF and their relationships with PVC burden. All the patients had an EF of ≤45% and were receiving standard medical therapy, including a β-blocker, an ACE inhibitor or ARB with or without a mineralocorticoid receptor antagonist. EF improved significantly to an average of 48% after radiofrequency catheter ablation (p=0.04); EF normalised (>50%) for three patients, improved to 45–50% for two patients and did not change for the remaining two. The greatest improvements in EF were seen in the two patients with an EF of <30% prior to ablation. Radiofrequency catheter ablation was also associated with a reduction in PVC burden from 27% to 1% (p=0.004).

Comment: Frequent ventricular ectopy is increasingly being recognised as a cause of LV dysfunction. Although the burden of ectopic activity required to produce LV dysfunction is contentious, above 10% has been proposed, but definitely >20–25% is accepted. This study from our centre shows that patients with a high burden of ectopic activity improve their LV function after ablation in general, and that the worse the baseline LV dysfunction, the greater the improvement with successful ablation, although this needs to be confirmed in larger studies.

Reference: Heart Lung Circ 2018;27(Suppl 2):abstract 0332

Analysis of aortic stenosis using artificial intelligence

Authors: Playford D et al.

Summary: These researchers develop an AI to impute the aortic valve area from echocardiographic data based on phenotypic cardiac responses to aortic stenosis, and without requiring LV outflow tract measurements, using data from a random 70% subset of 530884 echocardiograms obtained from 358661 patients from the National Echo Database Australia. The trained model was then tested against the remaining 30% of echocardiograms; after all LV outflow tract measurements and aortic valve areas were removed, the AI was tasked with predicting the LV outflow tract and aortic valve area measurements. A comparison between the predicted and original calculated aortic valve areas found that the AUROC (area under the receiver-operating characteristic curve) was 0.95 and the AUOCR (area under the precision recall curve) was 0.73. The model performed equally well for EFs <50% (1391 studies; 10% with severe aortic stenosis [aortic valve area <1cm²]), with respective AUROC and AUOCR values of 0.96 and 0.78, and for EFs <35% (426 studies; 10% with severe aortic stenosis) with respective AUROC and AUOCR values of 0.94 and 0.76.

Comment: With the availability of big datasets, AI is increasingly being studied to try and improve the diagnostic sensitivity and cost effectiveness of imaging, and is especially well suited to radiology and echocardiography. This study shows that AI algorithms can be used for more accurate assessment of aortic stenosis without LV outflow tract measurements, and larger studies are now taking place to refine and validate the algorithms, with the likelihood that they will be part of clinical practice in the not too distant future.

Reference: Heart Lung Circ 2018;27(Suppl 2):abstract 0389

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Detailed description of myocardial infarctions and the various subtypes in the LEADER trial

Authors: Simpson R et al.

Summary: The LEADER trial randomised 9340 patients with type 2 diabetes and established CV disease or a high CV risk to receive liraglutide or placebo, with 3.5–5 years of follow-up. This post hoc analysis reported on participants who experienced MI during the trial. Fewer liraglutide recipients experienced MI than placebo recipients (359 vs. 421 [p=0.02]); 17.8% of the MIs were silent. Compared with placebo, more liraglutide recipients who experienced an MI had undergone coronary artery bypass graft (30.8% vs. 21.5% [p=0.008]) or percutaneous coronary intervention (47.6% vs. 40.4% [p=0.070]), but fewer had a history of peripheral arterial disease (9.9% vs. 17.7% [p=0.005]) or >50% stenosis of coronary, carotid or other arteries (33.2% vs. 41.0% [p=0.044]) at baseline; there was also a trend for less diastolic dysfunction (13.4% vs. 18.9% [p=0.061]). Among symptomatic MIs (n=641), 297 and 344 occurred in liraglutide and placebo recipients, respectively, and 555 were non-ST-segment elevation MIs with 249 and 306 occurring in the respective arms. Liraglutide recipients had fewer fatal MIs than placebo recipients (17 vs. 24) and a trend toward fewer events with a troponin level >5 times the upper reference limit (139 vs. 189).

Comment: The LEADER trial showed that liraglutide reduced 3-point major adverse CV events in patients with type 2 diabetes and established CV disease. The mechanism for this is unclear, but the improvement in outcome was disproportionate to the small reduction in HbA1c (glycosylated haemoglobin) level with the intervention. There was also a significant reduction in MI in the treatment group, and a trend towards a reduction in fatal MI. Most MIs were non-ST-segment elevation MIs with smaller infarcts in patients who received the GLP-1 (glucagon-like peptide-1) agonist on top of standard therapy. These results were present with a relatively short treatment duration of 3 years, so the cardiac benefits of this therapy in patients with type 2 diabetes is likely to increase with longer treatment exposure.

Reference: Heart Lung Circ 2018;27(Suppl 2):abstract 0599

Effect of sacubitril/valsartan compared with enalapril, according to aetiology in Paradigm-HF

Authors: McMurray J et al.

Summary: This was a post hoc analysis on the effect of sacubitril/valsartan versus enalapril according to aetiology in 8399 PARADIGM-HF trial participants with HREF who had been randomised to an ARNI or an ACE inhibitor. Sacubitril/valsartan proved to retain benefit over enalapril across ischaemic (n=5036) and idiopathic (n=1595), hypertensive (n=968) and other (n=800) nonischaemic aetiologies, with no evidence of an aetiology-modified treatment effect on the composite primary endpoint (CV-related death or HF hospitalisation) or CV-related death alone (respective p values for interaction, 0.22 and 0.13).

Comment: With some device therapies used in the treatment of patients with HF, there seems to be a differential effect depending on the underlying cause of the LV dysfunction. This analysis showed that sacubitril/valsartan was effective in improving outcomes in patients with HF with a reduced EF of <35%, irrespective of the cause of the cardiomyopathy, so that this treatment should be considered in all patients with HF and an EF of <40% (Australian indication) who are still symptomatic despite optimal therapy with an ACE inhibitor or an ARB.

Reference: Heart Lung Circ 2018;27(Suppl 2):abstract 0605

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