ABSTRACTS

falls. Age, diabetes, hypertension, multiple co-morbidities and ≥3 antihypertensive medications use have been demonstrated to be risk factors in patients without primary autonomic dysfunction. Our study describes the prevalence, association with symptoms and risk factors for OH in medical, surgical and trauma wards in a tertiary hospital.

Methods: Seventy-six patients from four wards had resting supine and orthostatic blood pressures (BP) and pulse rates (PR) measured over four days.

Results: Patients' mean age was 67.8 ± 19.6 years.

Wards	OH prevalence	95% confidence intervals
Overall	23.7%	14.7–34.8
Medical	21.2%	9.0–38.9
Surgical	31.8%	13.9–54.9
Trauma	19.0%	5.4–41.9

OH had no association with symptoms. OH negative (OHN) and positive (OHP) groups displayed different homeostatic behaviours. OHN group demonstrated statistically significant normal compensatory increases in BP and PR over time to orthostatic challenge. Instead, OHP group demonstrated statistically significant fall in BP over time to standing. They also failed to show compensatory increase in PR, suggesting underlying blunted autonomic responses. There were no differences in age, number of co-morbidities and medication use as risk factors between two groups.

Conclusions: OH is common and mostly asymptomatic. Routine measurements are required to detect cases. Patients with OH displayed altered intrinsic physiologic responses to standing rather than having significant associated risk factors. Further physiologic studies are needed to determine the clinical significance of this for more effective management of OH.

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Primary Hypoplasia of Aortic Arch (phaa)—An Update

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Primary Hypoplasia of Aortic Arch (phaa) has been linked with hypertension (hbp) in the young adult through the association of Ohm's and Poiseuille's law relating resistance to flow in the aorta. Four patients were described last year. This is an update.

Aim: To investigate phaa in young adults presenting with hbp.

Method: Four new patients with hbp over the last 12 months were investigated by CT/MRI of aortic arch (aa) after exclusion of renal causes. Segmental measurements of aa were indexed to BSA as follows: (doi:10.1016/j.hlc.2008.05.474)

$$\text{Normalised Arch} = 14.56\text{BSA}^{0.543} \quad (1)$$

$$Z\ \text{score(s.d.)} = 11.49(\ln[\text{arch}]\text{mm} - 0.543\ \ln[\text{BSA}] - 2.678) \quad (2)$$

where $Z < -2$ = phaa and $Z > -2$ = normal arch.

BP > 130 mm Hg systolic = hbp.

Results: Two new patients with phaa were identified and are currently being observed before any decision is made for management.

Of the four original patients described: 1. Eighteen years previous double arch in infancy had aa stenting (Z −2.5 to −0.5) with settling of hbp 140/80 to 120/80 followup two years. 2. Fourteen years Turners syndrome with hbp 140/80 stented (Z −3 to 0) followup 12 months bp 120/70. 3. Fifteen years with asymptomatic vascular ring noted phaa (Z −4.3) early in childhood and developed hbp 174/71 at puberty. Awaiting treatment. 4. Twelve years post pda coil occlusion noted hbp 160/80 (Z −3.2) awaiting management strategy.

Conclusion:

1. Primary Hypoplasia of Aortic Arch indexed has been recognised in 6/8 young adults with hbp. Arch measurements should be undertaken in young adults with hbp.
2. Aortic arch stenting has resulted in drop of hbp in two patients. this appears to be a potentially good method of treatment.
3. Observation of patients is necessary to ascertain best outcome strategies.

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Reduced Exercise Tolerance in Patients with Increased Aortic Stiffness Assessed by 320-slice Computed Tomography

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Background: Increased aortic stiffness is associated with decreased exercise capacity and adverse cardiovascular outcome. It improves prediction when added to conventional cardiovascular risk factors. Assessment of aortic stiffness by 320-slice cardiac computed tomography angiography (CTA) is feasible, but associations with exercise have not been previously explored.

Methods: All patients were identified who underwent Bruce protocol exercise stress testing and CTA with functional imaging within 90 days, between September 2008 and December 2010 (47 patients). Images were reconstructed at 10% phase intervals throughout the cardiac cycle. Aortic strain ((systolic area − diastolic area)/diastolic area) was calculated 5 cm distal to the plane of the aortic valve. Exercise testing was terminated

according to usual clinical indications, predominantly exhaustion.

Results: Exercise duration was associated with aortic strain ($P < 0.001$, $r^2 = 0.25$), age ($P < 0.001$, $r^2 = 0.25$) and gender ($P < 0.01$) (lower in females). Strain and gender, but not age, were independently associated with exercise duration, with strain entering the model first ($P < 0.001$, $r^2 = 0.32$). Neither strain nor exercise duration was associated with rest or peak blood pressure, or rate pressure product. Aortic strain was not associated with the presence or severity of coronary artery disease in this moderate to high risk cohort. The relationship between aortic strain and exercise duration was similar in those with and without evidence of exercise induced myocardial ischaemia (ST depression $\geq$1 mm).

Conclusion: Aortic strain is associated with exercise duration in patients with and without myocardial ischaemia. Further research is merited to assess its potential to improve risk stratification or as a therapeutic target.

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Renal Denervation for Refractory Hypertension

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Background: Sympathetic activation is a cardinal feature of chronic renal failure (CRF) and contributes to poor cardiovascular outcomes. Both efferent and afferent renal nerves play a crucial role in blood pressure regulation and hypertension commonly associated with CRF. Renal nerve ablation has been shown to be safe and effective in patients with resistant hypertension with normal renal function. Whether this approach is safe and effective in hypertensive patients with an eGFR below 45 ml/min has not yet been explored.

Methods: In this pilot study, percutaneous endovascular radiofrequency ablation was performed in three hypertensive patients (age 67 ± 1 years) with CRF stage 3–4 (mean baseline eGFR 29.7 ± 3.8 ml/min). To reduce contrast exposure CO_2-angiography was used to visualise the renal arteries and to position the ablation catheter. Standardised office blood pressure (BP) readings and serum biochemistry were obtained before and 1, 7, and 28 days after the procedure.

Results: Mean baseline BP was $192 \pm 29/91 \pm 18$ mm Hg despite an average of 5.3 antihypertensive drugs. Each patient underwent treatment of both renal arteries in one session with an average of 4.2 ± 0.8 ablation treatments per artery. Angiographic evaluation before and directly after the procedure did not reveal any compromise of the treated arteries. There were no intra- or periprocedural complications. At seven day and 28 day follow up estimated GFR was 27.7 ± 6.0 and 27.7 ± 5.5 ml/min, and average BP was $179 \pm 11/86 \pm 15$ and $163 \pm 38/82 \pm 25$ mm Hg, respectively.

Conclusions: Our preliminary findings are indicative of a favourable short term safety profile and a rapid blood pressure response to renal denervation in high risk patients with CRF.

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Retrospective Audit of Hypertension Management in a Chronic Disease Management Unit at a Major Tertiary Hospital in Australia

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Hypertension is a known cardiovascular risk factor and treatment has been shown to reduce cardiovascular morbidity and mortality. The objective of this study was to evaluate hypertensive management in an outpatient clinic according to current Heart Foundation of Australia guidelines. A retrospective audit of all patients' records from their appointment in the month of May 2010 was conducted. A database was made of patients' blood pressure and co-morbid diseases in a spreadsheet and whether their blood pressure medication had been changed. 137 patients were included. Fifty-nine patients had diabetes mellitus and 60 of the 127 patients had ischaemic heart disease as co-morbidities. On 32 occasions, patients with diabetes and/or ischaemic heart disease recorded a systolic blood pressure greater than 130 mm Hg or a diastolic greater than 80 mm Hg. Only one of these 32 patients had their blood pressure therapy adjusted by the addition of a new medication or an increased dose of a pre-existing tablet. Ten patients without diabetes or ischaemic heart disease recorded a blood pressure systolic greater than 140 mm Hg or diastolic greater than 90 mm Hg. An appropriate change according to guidelines occurred in five patients. Results indicate that blood pressure management is suboptimal. Reasons for under-treatment may include therapeutic inertia, lack of time, lack of knowledge and competing management priorities. Subsequent changes to the clinic electronic record now incorporate guidelines for management of diabetes, and IHD. Mandatory tick boxes form part of the electronic record indicating guideline adherence or reasons for non-adherence, allowing us to more readily track out performance.

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