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SOUTHERN AFRICAN HYPERTENSION SOCIETY

Controlling Hypertension in Southern Africa: The New Frontier

16-18 AUGUST 2024

ABSTRACT BOOKLET

SAHS SOUTHERN AFRICAN HYPERTENSION SOCIETY

Disclaimer

The Abstracts for the Southern African Hypertension Society was reviewed by the SAHS Scientific Committee and not by the Editor-in-Chief, Regional Editors or reviewers of the ***Cardiovascular Journal of Africa***. Only accepted abstracts are published.

SOUTHERN AFRICAN **HYPERTENSION SOCIETY**

Know your blood pressure by

THANK YOU

To all our researchers,

On behalf of the Southern African Hypertension Society (SAHS), I want to extend our heartfelt thanks to all researchers submitting your abstract and your commitment of time to the important field of hypertension research. Your contributions are invaluable and play a crucial role in advancing our understanding and treatment of hypertension.

We deeply appreciate the effort and dedication you have put into your research. Your work not only contributes to the broader scientific community but also holds the potential to improve countless lives by enhancing our ability to manage and treat hypertension effectively.

The quality and diversity of the abstracts we received are truly impressive. Each submission reflects the hard work, innovative thinking, and expertise that you bring to this field. Your research not only addresses critical questions but also paves the way for future discoveries and advancements. Your research, as part of the scientific programme, has significantly advanced multidisciplinary learning in the field of hypertension and **"Controlling Hypertension in Southern Africa "**

Thank you once again for your dedication and commitment to hypertension research. Your work is making a difference, and we are grateful for your participation.

Prof Nash Ranjith
SAHS President

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Basic

Abstract Title

Involvement of pentraxin-3 in the development of hypertension but not left ventricular hypertrophy in spontaneously hypertensive rats

English Abstract

Introduction
Hypertension drives the development of concentric left ventricular hypertrophy (LVH). However, the relative contribution of pentraxin-3 (PTX-3) in the hypertrophic response to pressure overload has not been adequately elucidated. Aim: We sought to investigate the role of PTX-3 in the development of LVH in spontaneously hypertensive rats (SHR), untreated and treated with either captopril (an ACE inhibitor) or hydralazine (a non-specific vasodilator).

Methods
Three-month-old SHR received either 20 mg/kg/day hydralazine (SHR+H, n=6), 40 mg/kg/day captopril (SHR+C, n=6), or plain gelatine cubes (untreated SHR, n=7) orally for 4 months. Wistar Kyoto rats (WKY, n=7) were used as the normotensive controls. Blood pressure (BP) was measured using the tail-cuff method. At termination, cardiac geometry and function under anaesthesia were determined using M-mode echocardiography. Following termination, the blood, and the left ventricles (LV) were sampled. Circulating levels of inflammatory markers were measured in plasma by ELISA and relative mRNA expression of PTX-3 was determined in the LV by RT-PCR.

Results
Untreated SHR exhibited greater systolic BP and relative wall thickness (RWT) compared to WKY. Captopril and hydralazine normalised BP but only captopril reversed hypertrophic changes in SHR. Circulating PTX-3 levels were elevated in untreated SHR but normalised with captopril and hydralazine. Circulating PTX-3 was positively associated with systolic BP but lacked independent relations with indices of LVH. In addition, LV relative mRNA expression of PTX-3 was similar between the groups.

Conclusion
PTX-3, a circulating marker of hypertension, may not be involved in the development of LVH in SHR.

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ORAL PRESENTATION

ORAL PRESENTATION

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Clinical

Abstract Title

Vascular dysfunction and preclinical cardiovascular remodelling in resistant uncontrolled hypertension characterised by cardiovascular magnetic resonance and multi-modal imaging: a cross-sectional study

English Abstract

Introduction
Resistant hypertension (RH) is defined as blood pressure that remains above goal despite concurrent use of three or more antihypertensive agents of different classes. Patients with RH are at a greater risk of cardiovascular (CV) complications compared with patients who have controlled hypertension. The high CV risk is attributable, in part, to long-standing, poorly controlled hypertension. There is a paucity of data on RH and its association to cardiovascular disease (CVD) in Africans. This study defines the phenotype of RH using cardiovascular magnetic resonance imaging. Our findings may contribute to improved understanding of the pathophysiology of this disease in Africans.

Methods
The cardiovascular phenotype of patients with resistant uncontrolled hypertension (RUH) were compared to patients with resistant controlled hypertension (RCH) and matched controls, using cardiovascular magnetic resonance (CMR) and other imaging modalities. 61 participants (30 RUH, 20 RCH and 11 matched controls) underwent blood pressure measurements, CMR, echocardiography, electrocardiography, applanation tonometry and serum biomarker analysis.

Results
Patients with RUH were obese (73% vs 55%, p=0.01), with a history of retinopathy (47% vs 20%, p=0.001), albuminuria (33% vs 10%, p=0.002), myocardial infarction (10% vs 0%, p=0.009) and stroke (13.3% vs 0%, p=0.006). They had a longer duration of hypertension (10.5±10.7 vs. 3.6±3.4, p=0.02) with treatment that included an ACE-inhibitor (90% vs. 58%, p=0.01). They had higher mean arterial BP (115±17 vs 101±15 mmHg, p= 0.004), lower small artery elasticity (4.1±2.1 vs. 6.9±3.6ml/mmHgx100, p<0.001) and higher systemic vascular resistance (1754±418 vs. 1363±371 dyneXsecXcm-5, p=0.002) compared to patients with RCH. Patients with RUH and RCH compared to healthy controls on echocardiogrpahy had increased interventricular septum thickness (1.3±0.20 vs 1.2±0.17 vs 0.93±0.17), left ventricular (LV) posterior wall thickness (1.19±0.20 vs 1.08±0.16 vs 0.8±0.14, p<0.001) and increased deceleration time (200±43.7 vs 192±15.8 vs 167±7.9, p=0.02). On ECG, patients with RUH and RCH had a longer QRS duration (96.11±11.9 vs 95±15.9 vs 84±9.4, p=0.03) and on CMR, they had a higher LV stroke volume (vs 105±26 vs 100±21 vs 84±20, p=0.047), Native T1 molli (1243±44 vs 1236±57 vs 1184±23, p=0.002) and peak systolic circumferential strain rate (-1.3±0.3 vs -1.2±0.2 vs -1.1±0.3, p=0.048).

Conclusion
Vascular remodelling in RUH predates cardiovascular morbidity and can be used as an early indicator of remodelling using multimodal imaging.

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Article

Category

Researchers/Clinicians - Early, mid & senior career

Science Theme

Population

Abstract Title

Baroreceptor sensitivity, kidney function and positive family history of cardiovascular and lifestyle risk in boys with normal and elevated blood pressure

English Abstract

Introduction
Depressed baroreceptor sensitivity (BRS) is evident in hypertension, reported as a critical contributor to cardiovascular disease (CVD) risk in adults. Moreover, poor CVD outcomes are imminent pertaining to chronic kidney disease and heart failure. However, if the same associations can be discerned in younger cohorts are unknown. Our study therefore aimed to determine if BRS relates to kidney function and family history (FH) of CVD and lifestyle risk factors in prepubescent boys stratified by blood pressure status.

Methods
Our study included 40 black and 41 white boys (aged 6 – 8 years) from North-West, South Africa. Anthropometric and basic demographic data were collected (including information on FH. Cardiovascular measures included blood pressure (BP) and beat-to-beat Finometer measurement for BRS calculation. Urine samples were analysed to determine the albumin-to-creatinine ratio (ACR), indicative of kidney function. For statistical analysis, stratification was based on BP status of normal or elevated.

Results
The elevated BP group (n=37; 46%) had more Black boys (p=0.003). BRS (p=0.56) and ACR (p=0.92) were comparable between the normal and elevated BP groups. Within the normal BP group, BRS correlated with ACR in single (r=-0.43; p=0.006) and partial (r=-0.41; p=0.01) regression analysis after adjusting for ethnicity, age, and waist circumference. This association was confirmed in backward multiple linear regression analysis (β=-0.38; p=0.009) adjusting for age, ethnicity, waist circumference and mean arterial pressure. In the elevated BP group, BRS associated with FH in single (r=-0.39; p=0.02), partial (r=-0.55; p=0.001) and backward multiple linear regression analysis (β=-0.54; p=0.001). No association between BRS and ACR was evident in the elevated BP group.

Conclusion
We observed a cardioprotective relationship between BRS and kidney function in boys with normal blood pressure. Whereas, in boys with elevated blood pressure, their predisposed FH related cardiovascular risk may be amplified by lower BRS.

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ORAL PRESENTATION

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Article

Category

Researchers/Clinicians - Early, mid & senior career

Science Theme

Basic

Abstract Title

Association between nocturnal blood pressure and sleep duration in individuals with and without depressive symptoms

English Abstract

Introduction
Nocturnal blood pressure is a predictor of cardiovascular disease irrespective of daytime blood pressure. The magnitude of nocturnal blood pressure can be altered by various factors including sleep duration. Sleep dysregulation (short and long sleep duration) may be evident in individuals with depressive symptoms and is associated with increased nocturnal blood pressure, however, data in young populations are scant. The aim of this study was to investigate whether associations exist between nocturnal blood pressure and sleep duration in young adults with and without depressive symptoms.

Methods
We included apparently healthy individuals with (N=257) and without (N=531) depressive symptoms aged 20-30 years. Participants were normotensive at screening (clinic blood pressure <140/90 mmHg). We determined nocturnal blood pressure from 24-hour ambulatory blood pressure monitoring while sleep duration was assessed using diary cards and Acti-heart data. Stratification of individuals with and without depressive symptoms were based on the assessment of depression severity with the 9-item Patient Health Questionnaire (none-to-minimal symptoms and moderate-to-severe symptoms, respectively).

Results
Sleep duration was higher in individuals with depressive symptoms compared to those without depressive symptoms (p=0.004). After multiple adjustments for covariates, an independent negative association (Adjusted R-squared=0.109; β=-0.19; p=0.002) was observed between nocturnal diastolic blood pressure and sleep duration in individuals with depressive symptoms only.

Conclusion
The negative association between nocturnal diastolic blood pressure and sleep duration may indicate that longer sleep duration may be play a protective role against the elevated nocturnal blood pressure in individuals with depressive symptoms.

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Basic

Abstract Title

Predictors of estimated glomerular filtration rate decline, over a 10-year period in a cohort in the North West province, South Africa

English Abstract

Introduction
Decline in kidney function has been associated with increased risk of adverse renal outcomes, cardiovascular disease, and mortality. There is limited data available on the trajectory of kidney function overtime and risk factors in African populations. We investigated the changes in kidney function over a period of 10-years and determined the factors associated with decline in kidney function in an African population.

Methods
We followed 719 individuals aged 30 years and above from year 2005 to 2015 residing in urban and rural areas of the North West province in South Africa. Kidney function was assessed using estimated glomerular filtration rate (eGFR) measured at baseline and at a 10-year follow-up. A decline in kidney function was defined as a drop of 25% or more in eGFR. The risk factors investigated included age, sex, locality, baseline eGFR, hypertension, diabetes, obesity, dyslipidaemia, HIV status, smoking and alcohol consumption. Demographic and lifestyle information was collected using questionnaires and laboratory tests were conducted to analyse biological samples. The prevalence of hypertension, diabetes, obesity and dyslipidaemia were determined according to respective guidelines. Logistic regression analysis was employed to identify significant risk factors associated with the decline in kidney function.

Results
Of the 719 participants, 10.4% experienced a >25% decline in kidney function over the study period and their baseline eGFR was 97.6 ml/min/1.73m^2 which declined to 59.7 ml/min/1.73m^2 at follow-up. Among this group, 70% had hypertension, 15% had diabetes, 51% were obese, 37% were smokers, and 29% consumed alcohol. The identified primary risk factors associated with a decline in kidney function included age (OR: 3.32; 95% CI: 2.29 – 4.82), baseline eGFR (OR: 1.96; 95% CI: 1.28 – 2.99) and urban locality (OR: 2.40; 95% CI: 1.37 – 4.20.

Conclusion
Age, baseline eGFR and urban locality are strong and independent predictors of decline in kidney function. In the absence of independent results with the traditional risk factors (hypertension, diabetes, obesity, smoking, alcohol consumption); it is recommended that future studies consider additional risk factors related to the location of the individuals in addition to the traditional risk factors for the prediction of kidney function decline. Regular estimation of eGFR from a young age would allow targeted and timely intervention necessary to reduce the burden of kidney disease.

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ORAL PRESENTATION

ORAL PRESENTATION

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Article

Category

Researchers/Clinicians - Early, mid & senior career

Science Theme

Clinical

Abstract Title

Diabetic nephropathy induced impaired aortic function is not mediated by mean arterial pressure and its determinants

English Abstract

Introduction
Impaired aortic function is a core mechanism in the development of uremic cardiomyopathy. We recently documented in a large cohort of chronic kidney disease (CKD) patients (n=743) that mean arterial pressure (MAP) can fully account for the potential impact of presumed hypertensive nephropathy (HNP) (103.9-115.7%) but not diabetic nephropathy (DNP), (-2.0%-(-)7.5%) on pulsatile pressures including peripheral pulse pressure (PP) and systolic blood pressure (SBP). This suggests that impaired aortic function may be improved by volume control and/or reducing systemic vascular resistance (SVR) in patients with HNP but not those with DNP. Herein, we address this hypothesis.

Methods
The current multi-ethnic study (black 40.0%; white 24.4%; mixed race 7.8%; Asian 27.8%) included 115 CKD patients (67 non-dialysis and 48 dialysis). Their mean (SD) age was 57.7 (14.0) years, 37.4% were women and CKD duration was 5.4 (4.5) years. HNP (53.9%), DNP (32.2%), glomerulonephritis (19.1%) and HIV associated nephropathy (7.8%) comprised the major CKD etiologies. Concurrent HNP and DNP was present in 31.1% of the patients. Aortic function measures comprised PP, SBP, central pulse pressure, central systolic blood pressure, proximal aortic stiffness as estimated by the inverse of total arterial compliance (invTAC), carotid-femoral pulse wave velocity, backward wave pressure and forward wave pressure. The potential mutually independent impact of presumed HNP and DNP on aortic function was assessed in confounder and mediator adjusted multiple regression models. The contribution of MAP and the interaction between cardiac output (CO) and SVR to CKD etiology-aortic function relationships was assessed in adjusted product of coefficient mediation analysis. The calculated power of the study was 0.997 based on α=0.05.

Results
Patients with compared to without concurrent HNP and DNP experienced more frequent cardiovascular disease (43.2% versus 14.9%, p=0.01) and impaired aortic function (p=0.006-0.05 for 5 of the measures). DNP was independently associated with each aortic function measure (p<0.001-0.02). HNP was not directly related to aortic function (p>0.05). Other covariates that were consistently associated with impaired aortic function measures except for invTAC, included MAP (p<0.001-0.01) and its determinants. MAP and CO x SVR did not account for the potential effect of DNP on any aortic function measure (0.02-(-)7.3%). Dialysis status did not impact any of the identified relationships (interaction p>0.05).

Conclusion
This study validates our previously reported findings. Our results suggest that reducing MAP by decreasing volume overload and/or SVR through fluid intake restriction, diuretic therapy and antihypertensive agents or vasodilators may improve aortic function in the overall CKD population. However, these interventions are unlikely to reverse impaired aortic function that is induced by DNP. The potential impact of MAP and its determinants as well as DNP on aortic function is similar in non-dialysis and dialysis patients. Whether increased arterial medial calcification associated with diabetes and DNP explain our findings merits further study.

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Submission ID: 1629 *continued*

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ORAL PRESENTATION

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Basic

Abstract Title

Effects of Arterial Blood Pressure and Aortic Stiffness on the Inverse Relationship between Central Pulse Pressure and Heart Rate

English Abstract

Introduction
In various cardiovascular diseases the reduction of heart rate (HR) with β-blockers or other HR reducing agents is mandatory. However, decreases in HR are associated with increases in central aortic pulse pressure (PPc), which is concerning as increased central pressure pulsatility produces organ damage. However, whether the inverse relationship between HR and PPc is modified by either peripheral arterial blood pressure (BP) or aortic stiffness is unclear. Our aim was to determine, in an intervention study, the impact of arterial BP and aortic stiffness on the relationship between HR and PPc.

Methods
Patients with artificial cardiac pacemakers (n=16) were recruited from Life Flora Hospital in Roodepoort, Johannesburg between 2023 and 2024. Participants were paced in 10 bpm intervals in a range of 50-90 bpm. At each interval, central aortic BP was recorded using a SphygmoCor device and echocardiography was performed to assess aortic outflow tract diameter and flow velocity. Aortic characteristic impedance (aortic stiffness, Zc) was calculated from central aortic pressure and aortic flow using a standard formula. An average of 3 sets of measurements per participant (range of 2-4) was obtained, resulting in a total sample size of 48. To assess the impact of arterial BP, the study group was divided into those with systolic/diastolic BP below (n=20, low BP) versus above (n=28, high BP) 130/85mm Hg. To assess the impact of Zc, the study group was divided according to the median value of Zc (110dynes.s/cm5) (n=20 below [low Zc] and n=28 above [high Zc]). Multiple linear regression models adjusting for age, sex, body mass index and either peripheral arterial PP or mean arterial pressure (MAP) were used to determine the relationship between PPc and HR and the effects of peripheral arterial BP and aortic Zc on this relationship.

Results
Central aortic PP was inversely related to HR ($r=-0.287$, $p<0.05$), whereas peripheral arterial PP was not ($r=-0.058$, $p=0.70$). The PPc – HR relationship was independent of confounders including peripheral PP (partial $r=-0.474$, $p<0.005$) and MAP (partial $r=-0.409$, $p<0.01$). In patients with high BP, there was a strong PPc – HR relationship (partial $r=-0.729$, $p<0.0005$); whereas in patients with low BP, the relationship was weaker (partial $r=-0.508$, $p=0.05$). In patients with high Zc there was a strong PPc – HR relationship (partial $r=-0.672$, $p<0.0005$); whereas in patients with low Zc, the relationship was not significant (partial $r=-0.293$, $p=0.27$).

Conclusion
In an intervention study, we show that central aortic PP is inversely related to HR and that this relationship is modified by both peripheral arterial BP and aortic stiffness. These data suggest that in patients requiring HR reducing pharmacological agents, peripheral BP should be maintained at below 130/85 mm Hg in order to prevent organ damage associated with increased pulsatile loads. Furthermore, in conjunction with HR reducing agents, the use of pharmacological agents that reduce aortic stiffness, such as aldosterone receptor antagonists, is advisable.

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Clinical

Abstract Title

Comparison of Aortic Haemodynamics in Community Participants and Patients with Systolic Heart Failure and the Impact of Blood Pressure Control.

English Abstract

Introduction
In patients with systolic heart failure (HF), both decreases and increases in pulse pressure (PP) are associated with poor prognosis. If aortic PP in systolic HF is decreased due to systolic dysfunction, then improvements in stroke volume (SV) or forward wave pressure (Pf) would be beneficial. Alternatively, if hypertension is the primary cause of systolic HF, aortic PP may be increased due to high aortic characteristic impedance (Zc) and backward wave pressure (Pb), which would be detrimental. I aimed to compare central aortic hemodynamics, and the impact of BP control, between stable systolic HF patients and community participants.

Methods
Consecutive consenting adult patients diagnosed with HF of systolic origin (n=42), were randomly recruited from the hypertension clinic at Life Flora Hospital, Johannesburg. Central aortic pressure (SphygmoCor) and aortic outflow tract diameter and flow velocity (echocardiography) were acquired for each patient. The aortic pressure waves were coupled with the aortic flow waves, and wave separation analysis was performed to obtain the various determinants of PPc (backward wave pressure [Pb], forward wave pressure [Pf], reflected pressure, re-reflected pressure, aortic flow [Q], aortic characteristic impedance [Zc], the pressure generated by the product of flow and characteristic impedance [QxZc]). Stroke volume (SV) and systemic vascular resistance (SVR) were calculated using standard formulae. The data collected from the 42 stable HF patients, was compared to data collected in 298 age- and sex-matched participants from a community-based study, adjusting for potential confounders that may differ between these two groups. The impact of BP control (SBP/DBP<140/90mmHg), and more intense BP control (SBP/DBP<30/80 mm Hg), on comparisons of haemodynamic variables between patients with systolic HF and community participants, was assessed using multivariate-adjusted ANOVA.

Results
Systolic HF patients had lower central PP and Pb ($p<0.005$) and higher HR ($p<0.005$) than community participants. No other differences were noted. Systolic HF patients with uncontrolled BP (SBP/DBP≥140/90mmHg) had higher Zc ($p<0.005$), Pf ($p<0.05$), and SVR ($p<0.05$) than both HF patients and community participants with controlled BP. Despite similar peripheral and central PP to community participants with uncontrolled BP, Zc ($p<0.005$) and SVR ($p<0.05$) were higher in HF patients with uncontrolled BP. However, when assessing more intense BP control (SBP/DBP<130/80mmHg), the differences in Zc, QxZc, and SVR between the HF patients and community participants with uncontrolled BP were eliminated.

Conclusion
A lower central aortic PP, which was not due to decreased SV, was observed in stable systolic HF patients. However, in the presence of uncontrolled BP (SBP/DBP≥140/90mmHg), but not intense BP control (SBP/DBP<130/80mmHg), Zc, QxZc and SVR were increased in patients with systolic HF. Hence, BP control and its level of control are imperative in patients with systolic HF to protect the heart from the detrimental effects of increased afterloads.

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ORAL PRESENTATION

ORAL PRESENTATION

Submission ID: 1633

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Basic

Abstract Title

A prospective analysis to assess the multifactorial risk of childhood-onset hypertension: The ExAMIN Youth SA study

English Abstract

Introduction
Childhood-onset hypertension which tracks into adulthood is on the rise globally. Identifying the risk factors for primary hypertension in children remain epidemiologically relevant to develop early intervention and prevention strategies that will mitigate premature hypertension onset. This study explored the changes in blood pressure in South African children over a four-year period and tested the predictive value of individual and composite baseline risk factors for elevated blood pressure.

Methods
We included 767 healthy Black and White children with both baseline (mean age = 7 years) and follow-up (mean age = 11 years) data. Office blood pressure, anthropometry, cardiorespiratory fitness, health-related quality of life, food intake and urinary biomarkers were measured. Children were stratified into groups according to blood pressure status as determined by the 2017 American Academy of Pediatrics clinical practice guidelines. Individual baseline risk factors and composite risk factor patterns (obtained by exploratory factor analyses) were used to predict follow-up blood pressure status using Cox-proportional hazard ratios.

Results
The prevalence of elevated blood pressure increased by 5% over four-years. High-intensity physical activity (OR: 1.69; p= 0.024) and higher BMI-z score (OR: 2.68; p<0.001) cross-sectionally increased the odds of having baseline elevated blood pressure. Additionally, White ethnicity (HR: 2.00; p=0.028), higher BMI-z score (HR: 1.44; p=0.044), higher sugar-sweetened beverage intake (HR: 1.90; p=0.003), lower socioeconomic status (HR: 0.56; p=0.022), lower heart rate (HR: 0.72; p=0.041) and lower health-related quality of life (HR: 0.64; p=0.006) longitudinally predicted elevated blood pressure over four-years. No significant results were observed with composite risk factor patterns in cross-sectional or prospective analyses compared to individual risk factors.

Conclusion
Early intervention, focussing on individual, rather than composite, modifiable and non-modifiable risk factors, may reduce early-onset hypertension in childhood and the subsequent burden of cardiovascular disease in the global ageing population.

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Basic

Abstract Title

Impact of determinants of aortic pulse pressure on the relationship between heart rate and aortic pulse pressure: an intervention study in rats

English Abstract

Introduction
Heart rate-reducing agents such as β-blockers and ivabradine (IVB) are frequently used in the management of patients with cardiovascular disease. However, reductions in heart rate (HR) are associated with increases in central aortic pulse pressure (PPc), but not peripheral PP. The inverse HR-PPc relationship, and the mechanisms thereof, have been identified primarily in cross-sectional studies. Hence, intervention studies are required to establish causality and the primary mechanisms. The aim of my intervention study in rats, was to assess the effect of changes in HR on PPc, and the impact of the determinants of PPc on the HR-PPc relationship.

Methods
Male spontaneously hypertensive rats (SHR) (n=15) and Wistar Kyoto (WKY) normotensive rats (n=12), at 17 months of age, were studied. To induce changes in blood pressure (BP) and HR, approximately 7 doses of a vasoconstrictor, phenylephrine (PE) (0.5 mg/kg per dose), followed by about 6 doses of IVB (0.5 mg/kg per dose) were administered to anaesthetised rats. Central aortic pressures (carotid catheter and high-resolution pressure transducer paired with PowerLab Lab Chart 8 system) and aortic outflow tract diameter and flow velocity (echocardiography) were systematically acquired for each anaesthetised rat at baseline and then during the administration of PE and then IVB. The aortic pressure waves were coupled with the aortic flow waves, and wave separation analysis performed to obtain the various determinants of PPc (backward wave pressure [Pb], forward wave pressure [Pf], reflected pressure, re-reflected pressure, aortic flow [Q], aortic characteristic impedance [Zc], the pressure generated by the product of flow and characteristic impedance [QxZc]), using standard formulae. Bivariate and multivariate correlation analyses were performed to determine the relationship between HR and PPc, and the impact of determinants of PPc on this relationship respectively.

Results
Heart rate was inversely associated with PPc ($p<0.0001$), backward wave pressure (Pb) ($p<0.0001$), forward wave pressure (Pf) ($p<0.0001$), reflected pressure ($p<0.0001$), and re-reflected pressure ($p<0.0001$). On the contrary, aortic flow (Q), aortic characteristic impedance (Zc), and the pressure generated by the product of flow and characteristic impedance (QxZc) were not related to heart rate. The slope of the relationship between HR and PPc was diminished by adjustments for Pf, and markedly diminished by adjustments for Pb, reflected pressure, or re-reflected pressure ($p<0.05$ to $p<0.0001$).

Conclusion
In an intervention study in rats, we confirm the inverse relationship between HR and PPc, and show that wave reflection and re-reflection are the primary mechanisms responsible for the HR-PPc relationship. These data suggest that in individuals who require HR-reducing agents, wave-reflection and re-reflection should be targeted, such as by intensive lowering of BP.

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ORAL PRESENTATION

ORAL PRESENTATION

Submission ID: 1636

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Article

Category

Researchers/Clinicians - Early, mid & senior career

Science Theme

Clinical

Abstract Title

Prevalence and predictors of apparent treatment-resistant hypertension among patients in primary care in South Africa: a single-centre observational study

English Abstract

Introduction

The surge of cardiovascular disease across Sub-Saharan Africa is driven largely by hypertension and other cardiometabolic risk factors. South Africa, like other low-middle-income countries, faces a disproportionate burden due to the increasing prevalence of hypertension, exacerbated by low awareness, treatment, and control rates. The emergence of treatment-resistant hypertension (TRH) characterised by blood pressure above target levels despite use of three or more antihypertensive medications at maximally tolerated doses, or on four or more agents regardless of blood pressure control status -presents significant challenges to this goal. An increased risk of major adverse cardiovascular events, hypertensive-mediated organ damage, and increased healthcare costs are associated with this hypertension phenotype. Despite these serious implications, the impact of TRH in the South African context remains underexplored.

Methods

An observational analytical study was conducted at the chronic outpatient clinic at Wentworth Hospital, a district hospital in KwaZulu-Natal, South Africa, between March and April 2024. Our objective was to determine the prevalence, predictors, and profiles of TRH in a primary care setting among people living with hypertension (PLWH). We analysed demographic, clinical, and biochemical parameters of 400 systematically randomised essential hypertensive patients aged over 30. Participants underwent office blood pressure (BP) monitoring and completed an interviewer-administered questionnaire that assessed medication adherence, and risk score assessments. A chart review was conducted to assess clinical parameters and the antihypertensive drug profile. Determinants of apparent TRH were identified using a multivariate logistic regression model.

Results

The mean age of the sample was 64.42 years (SD = 10.75), with a female preponderance of 65% (n = 260), and two-thirds comprised of Black Africans (35.3%) and Indians (30.5%). Most of the PLWH were obese, with a median body mass index of 30.24 kg/m² (IQR = 8.2). The prevalence of apparent TRH was 18.8% (n = 75) among treated hypertensives, with uncontrolled TRH accounting for 11% (n = 44) and controlled TRH for 7.8% (n = 31). Compared with their non-resistant counterparts, multivariable analysis revealed that waist circumference (odds ratio [OR] = 1.04, p = <0.001), electrocardiographic left ventricular hypertrophy (OR = 5.06, p = 0.005), chronic kidney disease (OR = 2.70, p = 0.002), dyslipidaemia (OR = 2.51, p = 0.035), and a high obstructive sleep apnoea (OSA) risk score (OR = 2.16, p = 0.004) were predictive of apparent TRH. Mineralocorticoid receptor antagonists were an underused antihypertensive drug class overall, accounting for 10.8% (n = 43).

Conclusion

Hypertension control in Africa remains a critical priority, particularly in a healthcare setting burdened with multiple challenges. Notably, this study is the first to describe the prevalence of apparent TRH in a general hypertensive population in primary care in South Africa. These insights are particularly valuable for enhancing hypertensive management and updating guidelines locally, especially regarding the utility of cost-effective anthropometric and OSA screening measures to identify at-risk patients for further care escalation. Our findings reveal a complex interplay between cardiometabolic conditions and TRH, underscoring the need for multifaceted interventions to prevent cardiovascular events in this high-risk subgroup of PLWH.

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Article

Category

Researchers/Clinicians - Early, mid & senior career

Science Theme

Clinical

Abstract Title

The prevalence of undiagnosed impaired glucose regulation in patient presenting with an acute myocardial infarction

English Abstract

Introduction
Between euglycemia and diabetes is an area of prediabetes which includes impaired glucose tolerance and impaired fasting glucose. These entities, despite associated adverse outcomes, are often undiagnosed and unmanaged. Several tests are now well established for the diagnosis of pre-diabetes and diabetes. These include the fasting glucose, two-hour oral glucose tolerance test and glycosylated haemoglobin. Whilst recent literature has shown a high frequency of undiagnosed abnormal glucose metabolism in patients presenting with acute coronary syndromes, it remains unknown which of these modalities is the most sensitive in diagnosing a chronic state of dysglycemia in the acute setting.

Methods
This was a retrospective analysis of patients admitted to the R K Khan Hospital Coronary Care Unit between January 2006 to December 2011. Of the 2829 patients that were screened, 1933 were excluded, with only 896 eligible. All patients had a confirmed acute myocardial infarction and were not known to have diabetes mellitus. Patient with impaired renal function and known hemoglobinopathies were also excluded. A fasting plasma glucose and glycosylated haemoglobin was performed the morning after admission and an oral glucose tolerance test was conducted on day 4 of their hospital stay. Utilising the results from the above tests, patients were then classified via their glycemic profile as either euglycemic, pre diabetic or with overt diabetes mellitus. Data were analysed using Stata 14. Box-plots were utilised to provide graphical summaries of the percentile distribution of the blood glucose measurements. Association between categorical variables was assessed using the Pearson chi-square ($\chi 2$) test. Scatter plots were employed for pairwise comparison of FPG, 2hr OGTT and HbA1c. We estimated the likely true prevalence of diabetes by assuming an imperfect Gold Standard. The predictive performance of each measure against the latent diabetes outcomes was assessed using sensitivities and specificities, positive and negative predictive values.

Results
The study population comprised of 896 individuals, 80.58% of which presented with a STEMI. The majority of were males (70%), with an average age of 56.7 years. Most of the patients were Indian Asian (91.07%). Euglycemia occured in 65.29%, 33.48% and 20.76% of the patients by means of a fasting plasma glucose, 2 hour oral glucose tolerance test and HbA1C respectively. Utilising the fasting plasma glucose, we diagnosed 21.32% with impaired fasting glucose and 13.39% with diabetes. With the OGTT, 39.84% had impaired glucose tolerance and 26.67% diabetes. The HbA1C diagnosed 47.66% with pre diabetes and 31.58% with diabetes.

Conclusion
The results of our study show that of the 896 individuals admitted to the R K Khan Hospital CCU with an acute myocardial infarction, the majority have some form of abnormal glucose regulation. The prevalence of abnormal glucose regulation appears to be related to the diagnostic test utilised. Via the fasting plasma glucose almost two thirds of patients were euglycemic. However, 66.51% and 79.24 % of patients had either pre diabetes or overt diabetes mellitus using the OGTT and HbA1c respectively. It is therefore our recommendation that all patients with an acute myocardial infarction have both an admission HbA1c and pre-discharge OGTT.

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ORAL PRESENTATION

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Article

Category

Researchers/Clinicians - Early, mid & senior career

Science Theme

Basic

Abstract Title

Differential Responses to Adenine-Induced Chronic Kidney Disease in WKY and SHR Models

English Abstract

Introduction
Chronic kidney disease (CKD) is a multifactorial progressive condition that has a strikingly adverse impact on cardiovascular disease risk. The identification of CKD specific effects on the cardiovascular system is compounded by common comorbidities such as hypertension, diabetes, and cardiovascular disease. This complexity necessitates the development of animal models that can determine the distinct pathophysiological mechanisms of CKD and its cardiovascular impacts. The present study was designed to delineate the distinct cardiovascular outcomes associated with CKD only versus CKD with concurrent hypertension. We aimed to induce CKD in Wistar Kyoto rats (WKYs), representing a model of lone CKD, and Spontaneously Hypertensive Rats (SHRs), representing a model of CKD with comorbid hypertension.

Methods
Both WKY and SHR were divided into control and adenine-treated subgroups. The adenine treated groups were given adenine supplemented diet for 8 weeks. Prior to terminations, animals were placed in metabolic cages for 8 hours to collect urine. On the day of terminations, under anaesthesia, a catheter was inserted into the carotid artery to measure central pressures and echocardiography was performed to assess cardiac function. Pulsepenlab was used to determine aortic function. Blood samples were collected via cardiac puncture. Thereafter, the heart and kidneys were harvested and weighed.

Results
The urea concentration was larger in SHR-treated rats compared to those in other groups (P= 0.028) Central systolic blood pressure (P<0.001), pulse pressure (P<0.02) and mean arterial pressure (P<0.001) were larger in SHR and SHR-treated groups compared to the WKY and WKY-treated groups. The SHR-treated group had a larger pulse pressure compared the WKY-treated group (P<0.001). Forward wave pressure (P<002), augmentation index (P=006) and augmented pressure (P=0.004) were increased in SHR-treated compared to WKY and WKY-treated groups. Left ventricular mass adjusted to body weight was higher in the SHR treated (P=0.02) compared to other groups. Right kidney mass adjusted for body weight was larger in the SHR-treated group than in the SHR (P = 0.0004) and WKY control groups (P = 0.002). The WKY-treated group also had heavier right sided kidneys than the WKY control group. Left kidney mass adjusted for body weight was larger in the SHR-treated group than in the WKY (P = 0.0002) and the SHR control groups (P = 0.006).

Conclusion
SHRs experience a greater susceptibility to adenine-induced kidney impairment than WKYs. Adenine-induced kidney impairment causes more impaired aortic function, left ventricular mass and kidney weight in SHRs than in WKYs. The current study design can allow for determining the differential impact of lone CKD versus CKD with comorbid hypertension on cardiovascular function and structure.

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Basic

Abstract Title

Exploring Central Haemodynamic Pressure Assessment in Spontaneously Hypertensive Rats: A Comparison of Non-Invasive versus Invasive Techniques.

English Abstract

Introduction

The pulsatile blood pressure (BP) components, systolic BP and pulse pressure (PP), have a greater impact on cardiovascular mortality and morbidity than the steady components, diastolic BP and mean arterial pressure (MAP). To prevent cardiovascular events, PP should be reduced. However, the causes of increased PP are currently unclear, as most previous studies have been association and not intervention studies. Conducting intervention studies in humans, is ethically and practically challenging. Furthermore, invasive measurements in animal studies are often terminal, making it difficult to obtain repeated measurements over time. Non-invasive methods, such as PulsePen have been developed to address this issue. The aim of this study was to determine the accuracy of PulsePen®, with a specific focus on systolic and diastolic blood pressure, as well as the first systolic inflection point.

Methods

In 58 rats arterial BP was measured invasively (fluid filled catheter coupled to a high-resolution pressure transducer and PowerLab software) and non-invasively (applanation tonometry and PulsePen® software). The rats were placed under anaesthesia induced with 5% - 8% isoflurane in oxygen and maintained with 2% isoflurane. First the fluid-filled catheter was inserted into one carotid artery and via the pressure transducer a clear arterial pressure trace, indicating the first (inflection point, Pi) and second systolic peak (SBP), was continuously recorded. Secondly, the PulsePen® tonometers were positioned one on the skin perpendicular to the other carotid artery and one on the femoral artery. Prior to each pressure recording, calibration of the PulsePen® was performed using invasive PowerLab pressure values. Once a series of overlapping pressure traces had been obtained, the recorded data was automatically saved and analysed by the PulsePenLab® software. A wide range of pressure values (approximately 10 per rat) was obtained by the means of acute administration of vasoconstrictor agents. The pressures (SBP, Pi and PP) obtained non-invasively (PulsePen®) were compared to those obtained invasively (PowerLab) using paired t-test, Person's correlations and Bland-Altman plots.

Results

Systolic BP (r^2=0.92, $p<0.0001$), PP (r^2=0.78, $p<0.0001$), Pi (r^2=0.83, $p<0.0001$), and diastolic BP (r^2=0.95, $p<0.0001$), as measured by the two devices were well correlated. However, when comparing non-invasive to invasive measurements, systolic BP was 18.71±11.6 mm Hg lower ($p<0.0001$), PP was 17.98±8.93 mm Hg lower ($p<0.0001$), Pi was 4.54±13.37 mm Hg higher ($p<0.0001$), and diastolic BP was marginally higher 0.73±6.40 mm Hg ($p=0.0045$). The Bland-Altman plots revealed consistent underestimation of systolic BP and PP, and overestimation of Pi and diastolic BP over a wide range of BP values.

Conclusion

The non-invasive device overestimated Pi and underestimated systolic BP and PP. This could be due to a delay in the sampling rate of the PulsePen® given the high heart rate of the rats.

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ORAL PRESENTATION

ORAL PRESENTATION

Submission ID: 1649

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Article

Category

Researchers/Clinicians - Early, mid & senior career

Science Theme

Population

Abstract Title

Trends in summary exposure values attributable to top six elevated metabolic risk factors for hypertensive heart diseases in South Africa between 1990 and 2021: the Global Burden of Disease Study.

English Abstract

Introduction
Progress has been made in reducing the global burden of hypertensive heart diseases attributable to metabolic risk factors. These factors include high SBP, low density lipoprotein cholesterol (LDL-C), high BMI, high fasting plasma glucose, low bone mineral density, and kidney dysfunction. However, the prevalence and trajectories over time of these metabolic factors have not been analyzed in lower income countries.

Methods
We conducted a descriptive epidemiological analysis to evaluate the above risk factors for South Africa using data from the Global Burden of Disease (GBD) Study. We analyzed changes from 1990 to 2021 and trajectories of risk-specific summary exposure values (SEVs). An SEV is a risk-weighted prevalence of exposure ranging from 0-100, where 0 represents a scenario in which the entire population is exposed at the minimum level or risk and 100 indicates that the entire population is exposed at the maximum level of risk determined using systematic literature reviews. We analyzed annualized rates of change (AROCs) of SEVs over the study period. National and province-level estimates together with 95% Uncertainty Intervals (UIs) were generated.

Statistically, the GBD uses a theoretical minimum risk exposure level (TMREL) derived from epidemiological evidence for individual risk factors. SEVs were used to calculate population attributable fraction, i.e., proportional change in health risk that would occur if exposure to a risk factor were reduced to the TMREL.

Results
SEVs for metabolic risk factors for hypertensive heart diseases in South Africa increased linearly from 19.5 (95% UIs: 17.6-22.0) in 1990, to 29.9 (27.0-32.4) in 2019, to 30.9 (27.8-33.3) in 2021, and AROC of 0.58% (0.46-0.69). Relative to males, females had an approximately a 10-unit higher SEV for hypertensive heart diseases in 1990 and an approximately 15-unit higher increase in 2021. Country-wide and all provinces exceeded the global SEV of 13.0(11.6-14.8) for 1990 and 20.9(18.9-22.9) in 2021. Seven provinces had SEV exceeding 30% with the highest in KwaZulu Natal and North-West.

Conclusion
Metabolic risk factors contribute increasingly to hypertensive disease in South Africa. Interventions should prioritize high SBP and low LDL cholesterol. Behavioural and dietary factors should be analysed alongside metabolic factors to better and timely inform public health policies and practice.

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Category

Students - Currently enrolled postgraduate students

Science Theme

Clinical

Abstract Title

The clinical outcome of Peripartum cardiomyopathy at a tertiary level Hospital in South Africa.

English Abstract

Introduction
Peripartum cardiomyopathy (PPCM) is associated with increased morbidity and mortality among women of childbearing age and costly intensive care unit (ICU) admission. The aim of this study was to investigate the clinical outcomes of peripartum cardiomyopathy at a tertiary level hospital in South Africa.

Methods
This was a cross-sectional retrospective study undertaken from 1 January 2019 to 30 June 2022 at Dr George Mukhari Academic Hospital (DGMAH). Demographics, clinical characteristics, and laboratory and imaging findings were captured from medical records. Patient records were evaluated at time of diagnosis (baseline), up to the occurrence of an outcome and/or at six months. The threshold for significance was set at p <0.05.

Results
A total of 130 medical records of patients with a diagnosis of peripartum cardiomyopathy were drawn, and a total of 116 of these were found to be eligible for the study. The age of the patients ranged from 18–46 years. About 55 per cent 64 (55.17%) of patients completely recovered while 27 (23.28%) remained clinically stable, 22 (18.97%) were clinically unstable, and three (2.59%) belonged to the mortality group. Factors that were strongly associated with worse clinical outcomes were: multiparity [OR 1.99 (95% CI 0.54–4.22) p = 0.002]; higher New York Heart Association (NYHA) functional class IV [OR 1.66 (95% CI 0.71–3.84) p = 0.001]; left ventricular ejection fraction (LVEF) <25% [OR 1.03(0.91–1.81) p = 0.002], and baseline serum hyponatremia <135 mmol/L [OR 1.86 (95% CI 0.68–5.09) p <0,0001]. Baseline serum severe hyponatremia <120 mmol/L was the independent factor associated with longer hospital stay (≥30 days) [OR 1.86 (95% CI 0.68–5.09) [0.022] and 8 independently predicted mortality. A thromboembolic event was the major complication, at 18 (15.52%), with left ventricular thrombus being the most common site at 8 (44, 44%).

Conclusion
The study confirms previous findings from other local and international literature that majority of our patients completely recover within a period of six months. Baseline serum hyponatremia can be used as predictive factor for poor clinical outcome and longer length of stay in patients with PPCM; however, large studies to further investigate the long-term outcome of serum hyponatremia are justified

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POSTER PRESENTATION

POSTER PRESENTATION

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Article

Category

Researchers/Clinicians - Early, mid & senior career

Science Theme

Clinical

Abstract Title

Pressure Augmentation Index Does Not Adequately Express the Aortic Changes Associated with Hypertension or Hypertensive Heart Failure with A Preserved Ejection Fraction

English Abstract

Introduction
Some recent data suggest targeting aortic changes associated with hypertension has benefits beyond using the conventional blood pressure taken in the arm, in monitoring the treatment of hypertension, its complications or risk stratification of cardiovascular events. However, which of the aortic parameters better expresses the changes associated with hypertension remains controversial. The present study aimed to evaluate central aortic pressure parameters in hypertensive individuals (HTN), patients with hypertensive heart failure with a preserved ejection fraction (HFpEF) and compare these groups with a community sample of normal participants.

Methods
Standard criteria were used to recruit participants in the present study. Accordingly, 118 normal individuals from the general population (36.9 ±12.0 years), 55 hypertensive individuals (52.4 ±12.5 years) and 75 HFpEF patients (52.5 ±13.6 years) from the medical outpatient department and medical ward of the Sokoto Specialist Hospital, were evaluated for aortic pressure parameters. Applanation tonometry with PulsPen was utilized, based on the principles of generalized transfer function, (GTF) and it was interfaced with a computer. The results were compared among the groups using analysis of variance. In this regard, the central aortic pressure indices evaluated in the present study include forward pressure wave (Pf), backward wave (Pb), augmentation index (AIx), pulse pressure amplification (PPA), pulse wave velocity (PWV) and global reflection co-efficient (GRC).

Results
While PWV was significantly high (P <.0001) among the hypertensive and HFpEF groups, compared with the normal group (10.4 ±3.1m/s, 12.0 ±3.9m/s, and 7.8 ±2.5m/s), there were no significant differences in the AIx among the groups (19.2 ±6.7, 17.0 ±6.7 and 17.1 ±7.2, for HTN, HFpEF and normal groups, respectively, (P =.1410). The Pf, Pb and GRC, all showed significant changes (p <.0001) in the HTN and HFpEF groups, compared to the normal group. However, PPA was not different among the groups evaluated, (26.7 ±11.2%, 25.9 ±7.9% and 28.3 ±11.7% for HTN, HFpEF and normal groups, respectively, (P =.4170).

Conclusion
Although AIx, a derivative of wave reflection, is recognised by earlier studies as a correlate of cardiovascular mortality and a therapeutic target in hypertension and associated complications, in the present study, PWV, Pf, Pb and GRC all showed significant changes in the HTN and HFpEF groups compared to the normal group, beyond the AIx.

Submission ID: 1618 continued on next page

Submission ID: 1618 *continued*

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Fig 1.

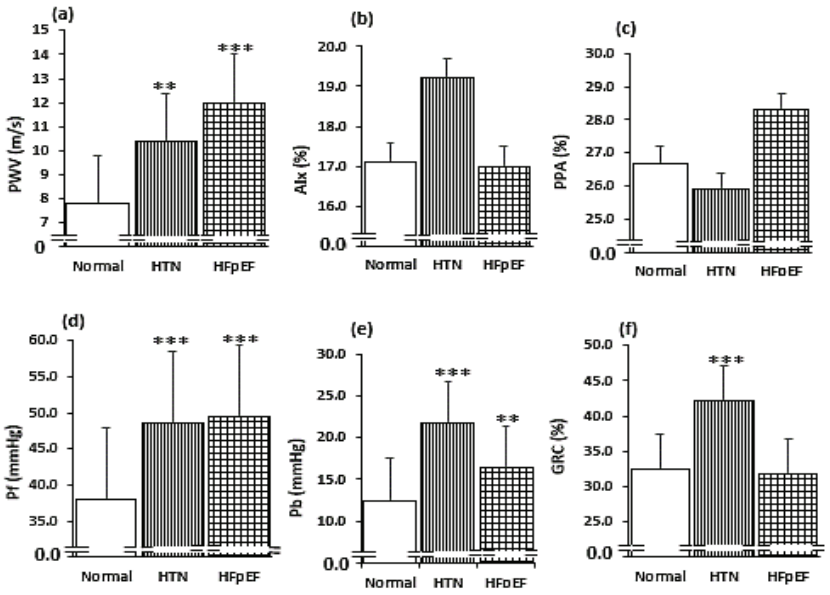

Figure 1a – 1f: Comparison of the three groups (Normal, HTN and HFpEF) using the various parameters of aortic functions.
NB: Hypertension (HTN), Heart failure with a preserved ejection fraction (HFpEF), Pulse wave velocity (PWV), Augmentation index (AIx), Pulse pressure amplification (PPA), Forward wave (Pf) Backward wave (Pb), Global reflection co-efficient (GRC). P <.001 (**), P <.0001 (***).

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POSTER PRESENTATION

POSTER PRESENTATION

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Population

Abstract Title

COMPARISON OF AORTIC HAEMODYNAMICS IN COMMUNITY PARTICIPANTS AND PATIENTS WITH SYSTOLIC HEART FAILURE AND THE IMPACT OF BLOOD PRESSURE CONTROL

English Abstract

Introduction
In patients with systolic heart failure (HF), both decreases and increases in pulse pressure (PP) are associated with poor prognosis. If aortic PP in systolic HF is decreased due to systolic dysfunction, then improvements in stroke volume (SV) or forward wave pressure (Pf) would be beneficial. Alternatively, if hypertension is the primary cause of systolic HF, aortic PP may be increased as a consequence of high aortic characteristic impedance (Zc) and backward wave pressure (Pb). Accordingly, blood pressure (BP) lowering would be advantageous.

Methods
I therefore compared aortic haemodynamics (central pressures [SphygmoCor], aortic tract outflow [echocardiography]), and the impact of controlled BP (SBP/DBP<140/90 mm Hg or SBP/DBP<130/80 mm Hg) between stable systolic HF patients (n=42) and age and sex-matched community participants (n=298).

Results
Systolic HF patients had lower central PP and Pb (p<0.005) and higher HR (p<0.005) than community participants. However, no other differences were noted. When assessing the impact of BP control (SBP/DBP<140/90 mm Hg), HF patients with uncontrolled BP had higher Zc (p<0.005), Pf (p<0.05), and systemic vascular resistance (SVR) (p<0.05) than both HF patients and community participants with controlled BP. Moreover, despite similar peripheral and central PP to community participants with uncontrolled BP, Zc (p<0.005) and SVR (p<0.05) were higher in HF patients with uncontrolled BP. However, when assessing more intense BP control (SBP/DBP<130/80 mm Hg), the differences in Zc, QxZc, and SVR between the systolic HF patients with uncontrolled BP and the community participants with uncontrolled BP were eliminated.

Conclusion
In conclusion, a lower aortic PP, which was not due to decreased SV, was observed in stable systolic HF patients. However, in the presence of uncontrolled BP (SBP/DBP≥140/90 mm Hg), but not SBP/DBP≥130/80 mm Hg, Zc, QxZc and SVR were increased in patients with systolic HF. Hence, BP control and its level of control are imperative in patients with systolic HF to protect the heart from the detrimental effects of increased afterloads.

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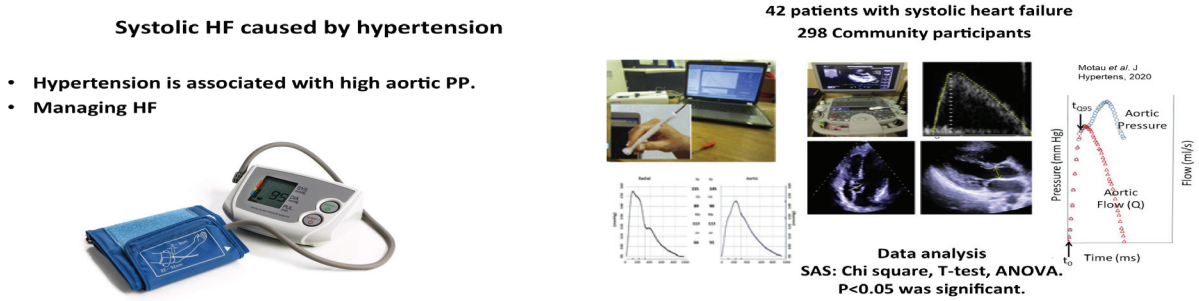

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Category

Researchers/Clinicians - Early, mid & senior career

Science Theme

Clinical

Abstract Title

ASSESSING AND IMPROVING ADHERENCE TO BLOOD PRESSURE MEASUREMENT GUIDELINES BY NURSES AT A DISTRICT HOSPITAL IN GAUTENG PROVINCE, SOUTH AFRICA

English Abstract

Introduction
The reported prevalence of hypertension varies across studies. A diagnosis or "labelling" of hypertension may result in psychological distress, increased costs and increased work absenteeism. Similarly, a wrongly diagnosed "high" blood pressure also has several negative effects. It is therefore vital to ensure that procedural recommendations are adhered to during the measurement of blood pressure, especially by health care practitioners. A quality improvement project was therefore developed to assess and improve procedural adherence to the 2014 South African Hypertension Society (SASH) guideline for BP measurement at a District hospital in South Africa.

Methods
A Quality Improvement Plan design was implemented to achieve the study objectives. The study was conducted between February 2020 and August 2020. It was divided into 3 phases; a pre-intervention assessment, an intervention and a post-intervention assessment. In phase 1 and 3, nurses in two wards and the triage unit of a District hospital in Ekurhuleni Health District were observed, each measuring the blood pressure of three patients. Phase 2 was an intervention. A checklist was developed, using the indicators recommended by the 2014 Southern African Hypertension Society guideline for blood pressure measurement, to observe the nurses. The checklist was valid and reliable (Cohen's kappa: 0.77).

Analysis was done using Microsoft Excel and Stata 14. The proportion of nurses adhering to all steps for blood pressure measurement was calculated in Phase 1 and 3. Procedures adherent to all indicators were considered "Acceptable", while those adherent to some steps were considered "Unacceptable". The proportion adherent to each indicator was also calculated for phase 1 and 3. Reasons for inadequate procedural adherence was also elicited in phase 1.

Ethical approvals were obtained from the Human Research Ethics Committee of the University of the Witwatersrand and the Ekurhuleni Research Ethics Committee.

Results
Thirty-seven nurses, equally observed 111 times, were recruited to participate in the study. The mean age of participants was 38 years. Thirty-five were female, and 11 were Registered nurses, 20 were Enrolled nurses and 6 were Auxiliary nurses. Some reasons for inadequate adherence to BP measurement procedure were knowledge deficit, staff shortage and uncooperative patients.

No nurse adhered to all recommended steps for BP measurement in Phase 1. After a training intervention, 25% of nurses were adherent to all steps recommended for BP measurement in phase 3.

Finally, the last calibration date of all the sphygmomanometers used were unknown.

Conclusion
The study revealed that the level of adherence to the steps of BP measurement, as recommended by the Southern African Hypertension Society 2014 guideline, may be very low. This has implications for the diagnosis and management of hypertension. The study further suggest that an educational intervention may be effective in improving the procedural adherence to the recommended steps for BP measurement.

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POSTER PRESENTATION

POSTER PRESENTATION

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Clinical

Abstract Title

Associations of blood pressure and depressive symptoms across different blood pressure profiles: The African-PREDICT study

English Abstract

Introduction
Hypertension (HTN) and depression increases the burden of cardiovascular disease, and adverse blood pressure (BP) profiles worsen cardiovascular outcomes. However, the co-occurrence is poorly understood due to discrepancies in literature. Each BP profile has different underlying physiological mechanisms and specific depressive symptoms present in distinct brain areas. The aim of this study was to investigate associations of BP, depressive symptom severity and individual depressive symptoms across different BP profiles.

Methods
This cross-sectional study consisted of individuals with masked HTN (N=56), white-coat HTN (N=52) and normotensives (N=503). To classify various BP profiles, office BP and 24-hour ambulatory BP monitoring were used. Depressive symptoms were assessed using the 9-item Patient Health Questionnaire.

Results
In masked hypertensives, 24-hour systolic BP (SBP) (β=-0.25; P=0.046) and 24-hour diastolic BP (DBP) (β=-0.36; P=0.004) associated inversely with anhedonia while office SBP (β=0.35; P=0.006) associated with poor appetite/overeating in white-coat hypertensives. In normotensives, 24-hour (β=0.07; P=0.050) and diurnal (β=0.08; P=0.041) SBP associated with poor appetite/overeating, respectively. Additionally, office SBP (β=0.13; P=0.040), 24-hour SBP (β=0.08; P=0.025), 24-hour DBP (β=0.13; P=0.003) and diurnal DBP (β=0.09; P=0.032) associated with psychomotor impairment/agitation in normotensives.

Conclusion
Our results indicate that screening distinct depressive symptoms instead of focusing only on depressive symptom severity could provide a better understanding of the pathophysiological mechanisms underlying HTN and depression comorbidity, provided that there are different underlying physiological mechanisms for each BP profile.

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Basic

Abstract Title

Dissociation of circadian misalignment and estrogen deficiency on cardiometabolic health in female spontaneously hypertensive rats

English Abstract

Introduction
Postmenopausal shift workers exhibit a heightened risk of cardiometabolic disorders. The risk is likely due to the dual impact of decreased estrogen concentrations associated with menopause and circadian misalignment resulting from irregular light exposure schedules. However, the combined effect of shiftwork-induced circadian misalignment and estrogen decline on cardiometabolic health remains poorly understood, particularly in individuals with pre-existing conditions like hypertension. The present study aimed to investigate whether circadian misalignment worsens cardiometabolic parameters in estrogen-deficient female spontaneously hypertensive rats (SHR).

Methods
Circadian misalignment was induced by a 10-week chronic phase shift (CPS) protocol, and estrogen deficiency was induced by ovariectomy. Female spontaneously hypertensive rats (SHR) (n=36) were either ovariectomized or sham-operated at 7 weeks old. Subsequently, they were exposed to either the chronic phase shift (CPS) or the control light (ctr light) schedule (n=9 per group) for 10 weeks. Body mass, food and water intake, blood pressure, and fasting blood glucose concentrations were measured throughout the 10-week intervention. An oral glucose tolerance test (OGTT) was performed 3 days before intervention completion. The ventricular systolic and diastolic function were assessed by echocardiography on the day of the 10-week intervention completion. Finally, organ masses were measured, and low-density lipoprotein (LDL) concentrations were determined using ELISA (enzyme-linked immunosorbent assay).

Results
Ovariectomized rats were heavier and had greater food intake and organ masses than sham-operated rats. When normalized to body mass, the food intake and organ masses were lower than in sham-operated rats. Ovariectomized rats had greater left ventricular (LV) dimensions and reduced LV contraction than sham-operated rats. The cardiometabolic parameters measured were similar between the CPS and control light rats, except for a greater water intake and a reduced liver mass in CPS rats. When normalized to body mass, sham-operated rats had a greater water intake than the ovariectomized rats. No interaction between ovariectomy and CPS was demonstrated.

Conclusion
Our findings indicate that estrogen deficiency impairs systolic function in female SHR, and circadian misalignment does not worsen cardiometabolic parameters in estrogen-deficient female SHR. However, circadian misalignment may still influence other physiological pathways in female SHR, warranting further investigation.

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Nthlane Refentshe Amandu's

Illustration of Case: Figures

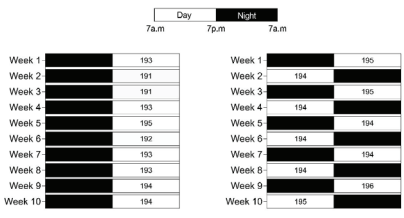

Figure 1.1: The 10-week intervention study design. The rats were assigned to either the control light (*left*) or the chronic phase shift (CPS) (*right*) schedules. The control light-exposed rats were maintained on a 12/12-hour light/dark cycle with lights on at 7 a.m. and lights off at 7 p.m. everyday. Whereas the CPS protocol-exposed rats were maintained on a 12/12-hour light/dark cycle reversed every 7 days (lights on at 7 p.m. and lights off at 7 a.m., followed by 7 days of control lighting schedule). The black and white bars above the panels indicate the duration of periods of light (*day*) and darkness (*night*), respectively. Data represented as a heat map and expressed as mean, with the light phase <200 lux and dark phase = 0 lux.

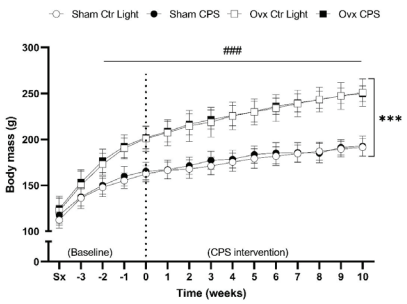

Figure 1.2: Changes in weekly body mass in female SHR. Body mass measurements were taken weekly, starting from the week of surgery (Sx) and continuing through the 10-week intervention period (week 0 to 10). The dotted line at week 0 separates the pre-intervention period (baseline) from the 10-week CPS intervention period. A significant increase in body mass was observed in all groups overtime. There was a significant effect of estrogen deficiency on body mass. Data expressed as mean ± SD, n=9 per group. Ctr Light, control lighting; CPS, chronic phase shift; Ovx, ovariectomy, Sx, pre-surgery body mass. ###, p<0.0001 change overtime; ***, p<0.0001 vs sham-operated groups.

POSTER PRESENTATION

POSTER PRESENTATION

Submission ID: 1638 *continued*

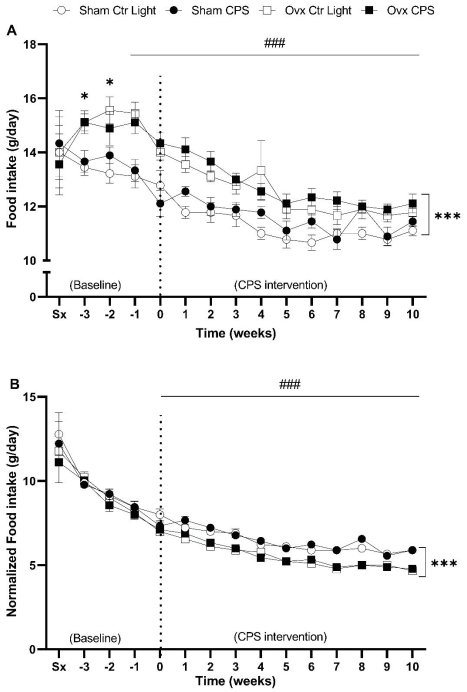

Figure 1.3: Changes in weekly A) food intake and B) *normalized* food intake in female SHR. Food intake was measured weekly from the week of surgery (Sx) and continuing through the 10-week intervention period (week 0 to 10). The dotted line at week 0 separates the pre-intervention period (baseline) from the 10-week CPS intervention period. Both food intake and normalized food intake significantly decreased in all groups overtime. Ovariectomized groups had an increased food intake compared to sham-operated groups. However, when normalized to body mass, ovariectomized groups had decreased food intake compared to sham-operated groups. Data expressed as mean ± SD, n=9 per group. Ctr Light, control lighting; CPS, chronic phase shift; Ovx, ovariectomy, Sx, pre-surgery food intake. ###, p<0.0001 change overtime; *, p<0.05 vs sham-operated groups; ***, p<0.0001 vs sham-operated groups.

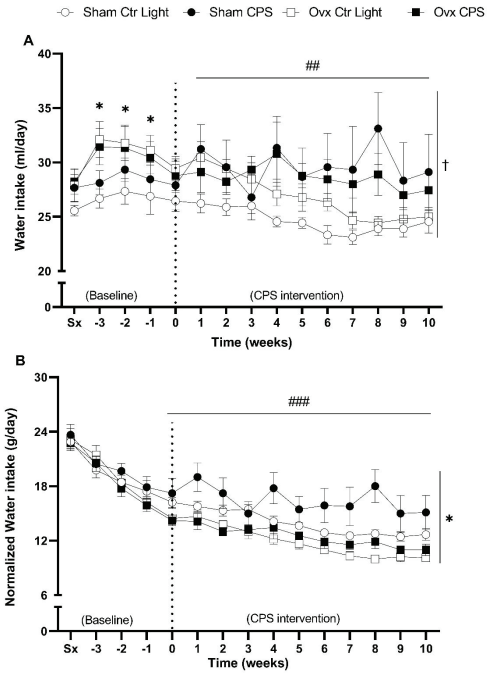

Figure 1.4: Changes in weekly A) water intake and B) *normalized* water intake in female SHR. Water intake was measured weekly from the week of surgery (Sx) and continuing through the 10-week intervention period (week 0 to 10). The dotted line at week 0 separates the pre-intervention period (baseline) from the 10-week CPS intervention period. Both water intake and normalized water intake significantly decreased in all groups overtime. Water intake was increased in ovariectomized groups 3 weeks following surgery, and from week 4 of CPS intervention the water intake was increased in the CPS groups compared to the control light groups. However, when normalized to body mass, ovariectomized groups has decreased water intake compared to sham-operated groups. Data expressed as mean ± SD, n=9 per group. Ctr Light, control lighting; CPS, chronic phase shift; Ovx, ovariectomy, Sx, pre-surgery water intake. ##, p<0.01 and ###, p<0.0001 change overtime; †, p<0.05 vs CPS groups; *, p<0.05 vs sham-operated groups

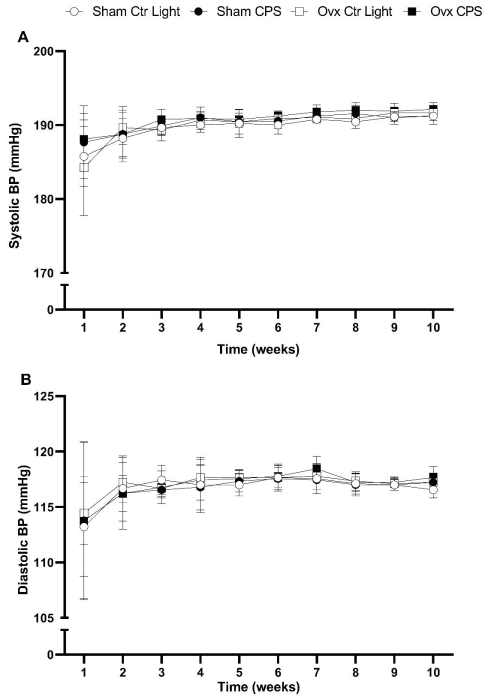

Figure 1.5: Changes in weekly A) systolic and B) diastolic blood pressure (BP) in female SHR during the 10-week CPS intervention. The BP was measured non-invasively using a NIBP250 monitor system. The systolic BP and diastolic BP remained similar across all groups, with no significant effect of CPS or estrogen deficiency. Data expressed as mean ± SD, n=9 per group. Ctr Light, control lighting; CPS, chronic phase shift; Ovx, ovariectomy; BP, blood pressure.

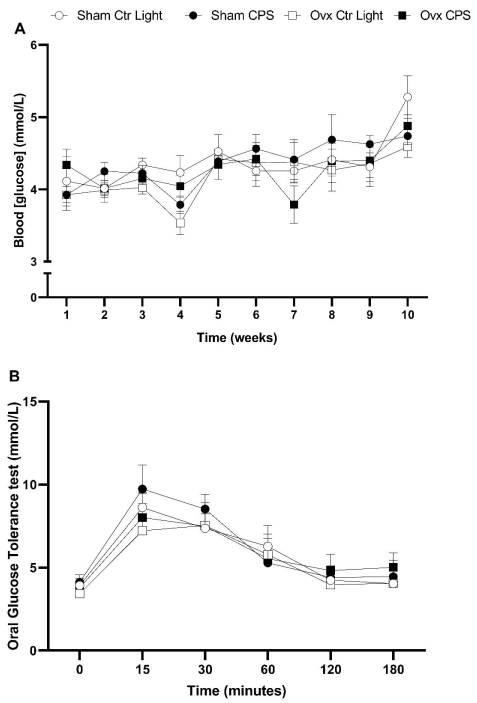

Figure 1.6: Changes in A) weekly fasting blood glucose concentrations and B) 3-hour oral glucose tolerance test (OGTT) results in female SHR. The fasting blood glucose concentrations were measured weekly during the 10-week CPS intervention. The 3-hour OGTT was performed 3 days before the end of the 10-week CPS intervention. No significant differences were observed in fasting blood glucose or glucose tolerance between all the groups. Data expressed as mean ± SD, n=9 per group. Ctr Light, control lighting; CPS, chronic phase shift; Ovx, ovariectomy.

Submission ID: 1638 *continued*

Table 3. 1: Characteristics of 5-month-old female ovariectomized and sham operated SHR after10-week chronic phase shift or control light protocol.

Characteristics	Sham Control light n=9	Sham CPS n=9	Ova Control light n=9	Ova CPS n=9
AUC OGTT, min*mmol/L	28.3 ± 4.2	29.6 ± 5.9	28.0 ± 3.7	27.6 ± 4.3
Peak OGTT, mmol/L	7.2 ± 1.3	8.7 ± 2.2	7.1 ± 1.5	7.1 ± 1.9
Final body mass, g	191 ± 10	193 ± 11	251 ± 15***	250 ± 9***
Heart mass, g	0.86 ± 0.06	0.88 ± 0.06	0.95 ± 0.07***	0.95 ± 0.06***
Left ventricle mass, g	0.64 ± 0.04	0.65 ± 0.05	0.72 ± 0.04***	0.71 ± 0.05***
Liver mass, g	7.1 ± 0.5	6.8 ± 0.4†	8.1 ± 0.8***	7.6 ± 0.5***†
Kidney mass, g	0.66 ± 0,07	0.64 ± 0.09	0.71 ± 0.05*	0.69 ± 0.06*
Normalized heart mass, g/100g	0.45 ± 0.03	0.46 ± 0.04	0.38 ± 0.02***	0.38 ± 0.02***
Normalized left ventricle mass, g/100g	0.34 ± 0.02	0.34 ± 0.02	0.29 ± 0.01***	0.29 ± 0.02***
Normalized liver mass, g/100g	3.7 ± 0.3	3.5 ± 0.2†	3.2 ± 0.2***	3.1 ± 0.2***†
Normalized kidney mass, g/100g	0.34 ± 0.03	0.33 ± 0.04	0.29 ± 0.02***	0.28 ± 0.02***
LDL, ug/mL	9.1 ± 6.5	13.9 ± 10.0	9.7 ± 6.6	15.8 ± 12.1

Data expressed as mean ± SD. SHR, spontaneously hypertensive rats; CPS, chronic phase shift; Ova, ovariectomy; AUC, area under graph; OGTT, oral glucose tolerance test; LDL, low-density lipoprotein. *, p < 0.05 vs sham-operated groups; **, p < 0.01 vs sham-operated groups; ***, p < 0.001 vs sham-operated groups; †, p ≤ 0.05 vs control light groups.

Table 3. 2: M–mode and M–mode derived echocardiographic parameters of 5-month-old female ovariectomized and sham operated SHR after 10-week chronic phase shift or control light protocol.

Parameters	Sham Control light n=9	Sham CPS n=9	Ova Control light n=9	Ova CPS n=9
Interventricular (mm)				
IVSTd	2.4 ± 0.3	2.3 ± 0.4	2.2 ± 0.5	2.7 ± 0.4
IVSTs	3.4 ± 0.1	3.3 ± 0.5	3.1 ± 0.7	3.5 ± 0.3
Left ventricular diameters (mm)				
LVEDd	4.5 ± 0.6	4.6 ± 0.7	5.1 ± 0.5*	5.0 ± 0.4*
LVEDs	2.4 ± 0.4	2.4 ± 0.5	3.0 ± 0.7**	3.0 ± 0.4**
Posterior wall thickness (mm)				
LVPWTd	2.1 ± 0.6	2.1 ± 0.6	2.3 ± 0.4	2.0 ± 0.5
LVPWTs	2.8 ± 0.6	2.8 ± 0.5	2.9 ± 0.5	2.6 ± 0.6
Derived				
Relative wall thickness	1.0 ± 0.4	1.0 ± 0.4	0.9 ± 0.2	0.8 ± 0.3
FS_{end}, %	48.2 ± 3.3	49.0 ± 5.2	41.7 ± 10.0**	40.5 ± 6.0**
FS_{mid}, %	23.1 ± 3.3	23.1 ± 3.7	20.4 ± 5.5	19.9 ± 4.7
EF, %	79.6 ± 3.3	80.1 ± 4.8	71.2 ± 12.5**	70.6 ± 7.2**
SV, µL	76.7 ± 23.2	79.9 ± 24.5	87.8 ± 19.2	84.9 ± 16.9

Data expressed as mean ± SD. SHR, spontaneously hypertensive rats; CPS, chronic phase shift; Ova, ovariectomy; IVSTd, intraventricular septal diameter end diastole; IVSTs, intraventricular septal diameter end systole; LVEDd, left ventricular end-diastolic diameter; LVEDs, left ventricular end-diastolic diameter; LVPWTd, left ventricular posterior wall thickness in diastole; LVPWTs, left ventricular posterior wall thickness in systole; FSend, endocardial fractional shortening; FSmid, mid wall fractional shortening; EF, ejection fraction; SV, stroke volume. *, p ≤ 0.05 vs sham-operated groups; **, p < 0.01 vs sham-operated groups

Table 3. 3: Tissue and pulse Doppler echocardiography parameters of 5-month-old female ovariectomized and sham-operated SHR after 10-week chronic phase shift or control light protocol.

Parameters	Sham Control light n=9	Sham CPS n=9	Ova Control light n=9	Ova CPS n=9
Tissue doppler				
e', cm/s	5.1 ± 0.8	6.4 ± 2.4	6.1 ± 0.7	5.6 ± 1.2
a', cm/s	3.3 ± 0.5	4.3 ± 0.9	3.7 ± 0.6	4.4 ± 1.9
s', cm/s	4.8 ± 0.7	5.3 ± 0.4	4.6 ± 0.7	4.6 ± 1.1
Pulse doppler				
E, cm/s	84.3 ± 18.8	86.6 ± 26.7	86.3 ± 22.8	89.9 ± 10.4
A, cm/s	52.9 ± 20.6	57.5 ± 20.3	57.6 ± 20.3	55.9 ± 15.3
Derived				
E/A	1.71 ± 0.45	1.57 ± 0.35	1.62 ± 0.47	1.73 ± 0.51
E/e'	17.5 ± 7.1	15.7 ± 9.0	14.4 ± 3.9	17.0 ± 4.8
e'/a'	1.6 ± 0.3	1.6 ± 0.7	1.7 ± 0.3	1.4 ± 0.5

Data expressed as mean ± SD. SHR, spontaneously hypertensive rats; CPS, chronic phase shift; Ova, ovariectomy; e', early peak tissue lengthening velocity at the lateral mitral annulus; a', late peak tissue lengthening velocity at the lateral mitral annulus; s', peak systolic velocity; E, maximum early mitral inflow velocity; A, maximum late mitral inflow velocity; E/e', early diastolic mitral inflow velocity to early diastolic mitral annulus velocity; E/A, early to late diastolic filling velocity ratio; e'/a', early to late peak tissue lengthening velocity ratio.

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POSTER PRESENTATION

Submission ID: 1639

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Basic

Abstract Title

GDF-15 and Covid-19 antibody levels in young South African adults: PRECEED-Africa Study

English Abstract

Introduction
Despite the reduction in COVID-19 cases and mortality rates, the continuing impact thereof with remaining health concerns, especially premature development for cardiovascular disease, are still being investigated. Growth differentiation factor-15 (GDF-15) is up-regulated in pathological conditions that involve inflammation, including COVID-19, and is associated with increased risk for cardiovascular disease development. Since GDF-15 is associated with various cardiovascular disease risk factors, we aimed to explore whether GDF-15 levels will differ between previously SARS-CoV-2 exposed adults compared to controls.

Methods
We included n=135 apparently healthy (no chronic illnesses) black and white men and women between the ages of 20-30-years-old from the African-PREDICT study. MILLIPLEX® multiplex kits utilizing the Luminex® xMAP® technology (Merck KGaA, Darmstadt, Germany) were used to determine a cut-off index for SARS-CoV-2 antibody response. A cut-off index were determined by using stored samples collected before 2018 to ensure the absence of SARS-CoV-2 antibodies. The cut-off index were subsequently used to group participants in two groups namely previously SARS-CoV-2 infected (IgG and IgA antibody levels above the cut-point) (n=70) and uninfected controls (IgG and IgA antibody levels below the cut-point). None of the previous SARS-CoV-2 infected participants (n=70) were hospitalised or vaccinated for COVID-19.

Results
We found significant higher levels of GDF-15 in the previous SARS-CoV-2 exposed group compared to controls (p=0.045) after adjustments for sex and race. Our results may suggest that these young adults with possible previous infected SARS-CoV-2 may have an increased risk for premature cardiovascular disease development.

Conclusion
Our results may suggest that these young adults with previous infected SARS-CoV-2 may have an increased risk for premature cardiovascular disease development.

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Basic

Abstract Title

The reality of the adherence to dietary modification recommendations in patients with hypertension at Chris Hani Baragwanath Hospital, Johannesburg, South Africa

English Abstract

Introduction
Proper management is necessary to prevent hypertension-related complications and improve the patient's quality of life. This includes pharmacological intervention and lifestyle changes, for example, dietary modifications. The Diet Approach to Stop Hypertension (DASH) diet and dietary sodium reduction are dietary modifications shown to reduce hypertension. Despite the effectiveness of these dietary modifications, some studies demonstrate low adherence to dietary recommendations. Research on hypertensive individuals' adherence to the DASH diet and dietary sodium reduction recommendations in South Africa is limited. There is also scarce research on their knowledge of the DASH diet and barriers to adherence among South Africans.

Methods
A cross-sectional study was conducted on patients diagnosed with hypertension in the cardiac clinic of the Chris Hani Baragwanath Hospital, using a questionnaire. The questionnaire was provided in English and Zulu, a local language. A pilot study was conducted to ensure the research tool is reliable and valid. The questionnaire was translated by an individual who is fluent in both languages. The questionnaire was then back-translated by a second individual who is fluent in both languages. The back translation was compared with the original to assess and validate the translated questionnaire. Prospective sampling was used to recruit individuals awaiting routine follow-up care at the cardiac clinic to participate in the study. Data collection took place over 7 months. The data was analysed using STATA.

Results
The questionnaire had 123 respondents, the majority of whom were female (57%) and had been diagnosed with hypertension more than 10 years ago (56%). Among 88 respondents, 96% (85) respondents were instructed what it is they should eat for blood pressure control, yet only 67% (59) respondents state that they follow healthy diet recommendations. Furthermore, it was also found that 70% of respondents had not been provided with information that they could reassess once leaving the healthcare vicinity, while 63% (55) respondents believed what you eat can affect your blood pressure.

Conclusion
Adherence to dietary modifications among patients with hypertension was relatively high in this study. However, not all patients who were recommended dietary modifications agreed to being adherent. Additionally, not all participants believed that blood pressure can be affected by diet, which could influence their perception of risk. This study highlights the complexity of hypertension management and so the results may assist in guiding programs to improve the adherence to dietary modification and thus, the improvement of blood pressure control of individuals with hypertension and reduce hypertension-related complications.

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POSTER PRESENTATION

POSTER PRESENTATION

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Students - Currently enrolled postgraduate students

Science Theme

Basic

Abstract Title

LPS-induced inflammation worsens cardiac dysfunction in a hypertensive model

English Abstract

Introduction
Hypertension causes structural remodelling of the myocardium, which often results in left ventricular (LV) dysfunction. Systemic inflammation contributes to LV systolic and diastolic dysfunction. The compounding effect of inflammation on hypertension-induced LV dysfunction is uncertain. This study investigated the short- and long-term effects of acute exposure to lipopolysaccharide (LPS) on LV structure and function in a hypertensive rat model.

Methods
Wistar-Kyoto (WKY, n=36) and spontaneously hypertensive rats (SHR, n=38) were divided into control or LPS groups, receiving a single dose of saline or 1 mg/kg LPS, respectively. The rats were further divided into the short-term group, which were terminated 24 hours after injections, or the long-term group, which were terminated 6 weeks after injections. LV geometry, systolic and diastolic functions were determined using conventional and speckle tracking echocardiography. Serum interleukin (IL)-1β concentrations were determined using an ELISA and LV collagen content was determined with histology. A two-way ANOVA was used to determine group differences. Pearson's correlation was used to determine associations.

Results
In the short-term groups, LPS increased serum IL-1β concentration and impaired LV systolic and diastolic function in SHR and WKY rats compared to the rats in the respective control groups. In the short term, LPS administration worsened LV systolic and diastolic dysfunction in SHR compared to the WKY rats. In the long term, there were no significant LPS-induced effects on any LV function markers. Hypertension resulted in increased heart weight and impaired LV systolic function in SHR compared to WKY rats. In the presence of hypertension, LPS administration increased collagen volume and worsened LV systolic dysfunction.

Conclusion
In conclusion, acute LPS exposure induced short- and long-term cardiac structural changes and LV systolic and diastolic dysfunction, which were worsened in rats predisposed to hypertension.

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Science Theme

Population

Abstract Title

Feasibility and acceptability evaluation of a contextualized physical activity and diet intervention for the control of hypertension in adults from rural South Africa.

English Abstract

Introduction
Despite the known benefits of physical activity and diet modifications for hypertension control, adults in rural South African settings still have high levels of uncontrolled hypertension. Most physical activity and diet interventions for hypertension control of rural adults require financial commitment and are not tailored to suit their contextual needs. This study outlines an intervention which targets adjusting routine physical activity and diet practices for the control of hypertension in adults from rural South Africa (HYPHEN).The aim of this study was to evaluate the feasibility and acceptability of HYPHEN for adults aged 40 years and older living with hypertension in rural north-east South Africa.

Methods
A one-arm 10-weeks intervention was conducted. Feasibility was measured via assessing recruitment and retention rates. Acceptability was assessed through interviews after the 10 weeks intervention using pre-determined themes of perceived expectations, benefits, motivation, and barriers concerning the intervention. Fidelity was evaluated by intervention adherence, dosage, quality, and participant responsiveness.

Results
Data collected to measure outcomes was complete. Our study demonstrated high level of feasibility, acceptability, and fidelity. Thirty (100% of target) participants were successfully recruited over two days, 28 (93%) participants were retained, and 28 (93%) provided complete data. Qualitative data demonstrated high acceptability. All four measures of fidelity demonstrated that the intervention was delivered as planned. The study demonstrated a promise of success with a modest reduction in systolic blood pressure.

Conclusion
This was, to the authors' knowledge, the first study in rural South Africa to determine whether adaptations in physical activity and diet based on existing daily routine would be feasible and acceptable by adults for the control of hypertension. Although deemed feasible and acceptable, some amendments are required to the intervention procedures that were carried out before a full trial can be rolled out.

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POSTER PRESENTATION

POSTER PRESENTATION

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Article

Category

Students - Currently enrolled postgraduate students

Science Theme

Clinical

Abstract Title

Pheocromocytoma as cause of secondary hypertension presented with hypertensive emergency: A Case Report

English Abstract

Introduction

Hypertension is a frequent, chronic, age-related disorder, in young patients with high blood pleasure, secondary causes of hypertation must be considered. Secondary hypertension is defined as an increase in blood pressure due to an identifiable cause that can be treated with a cause-specific intervention. Pheochromocytomas are tumors that originate from chromaffin cells located in the adrenal glands, characterized by the production of catecholamines, most frequently adrenaline and noradrenaline. These tumors are associated with high blood pressure, and classic triad of presentation characterized by headache, sweating and palpitations.

Methods

A 45 years old woman, admitted to our hospital, on the Emergency Room with epigastric pain,vomiting and increased blood pressure 240/160mmHg. One month prior to admission, she presented headache, hyperhidrosis and palpitation. She had story of resistant hypertation.

Physical examination reveled no pale conjunctiva, hydrated, Heart Rate 108bpm and abdominal epigastric pain. Laboratory findings showed hemoglobin 13g/dl BUN: 55.3 mg/dl, creatinine 3.7mg/dl, HIV negative, Total Metanephrines 4813 (reference 103-1144µg/24h), Normetanephrine 1916 (reference <390 µg/24h). Imaging findings abdominal magnetic resonance showed a tumor measuring 54.1x43.6mm is visualized in the projection of the adrenal gland on the right with regular contours and homogeneous parenchyma.

Results

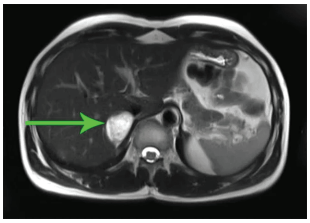
The patient was diagnosed with Pheocromocytoma presented with hipertensive emergence, and the initial managment included sodium nitroprusside and omeprazole. The tumor was surgically removed and a Pheocromocytoma was confirmed histologically. After surgery, she progressed satisfactorily with clinical improvement and complete remission of symptoms, blood pressure is controlled (130/80) by taking one calcium channel blocker (nifedipine 30mg/daily).

Conclusion

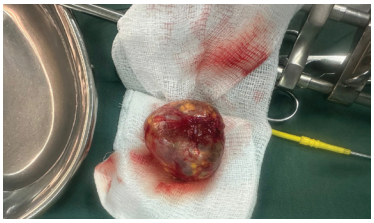
Patients with resistant arterial hypertension should be screened for secondary hypertension and it should be suspected in young patients, without identifiable risk factors, with high blood pressure levels.

Upload your slides or pictures illustrating the case

Picture1.Abdominal Magnetic resonace showing the pheocromocytoma



Picture 2. Surgical piece



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