Abstracts from the 2024 Annual Scientific Meeting of the British and Irish Hypertension Society (BIHS)

The Bridgewater Hall, Manchester, 09 – 10 September 2024

Conference Organizer: In Conference Ltd on behalf of BIHS.

https://bihsoc.org/events/2024-annual-scientific-meeting/

All content was reviewed and approved by members of the British and Irish Hypertension Society, which held full responsibility for the abstract selections.

Sponsorship: Funding for the publication of this supplement was provided by the British and Irish Hypertension Society for the advancement of knowledge and dissemination of information concerning the pathophysiology, epidemiology, detection, investigation and treatment of arterial hypertension and related vascular diseases.

BIHS
British and Irish Hypertension Society
Committed to preventing cardiovascular disease

Contents

CS-01 - Investigations and Management of Primary Aldosteronism: One Size Does Not Fit All!

Dr Spoorthy Kulkarni[1], Dr Joanna Gray[2], Prof. Ian Wilkinson[1,1]University of Cambridge, [2]Cambridge University Hospitals NHS Foundation Trust

Introduction:

A 40-year-old, Caucasian female presented with new-onset-hypertension (HTN). She had a family history of HTN (parents and sister). Her biochemistry results were normal with renin was 4 mU/L and aldosterone 300 pmol/L. She was prescribed amlodipine and discharged from clinic. 5 years later she presented with worsening HTN, hypokalaemia needing intravenous supplementation. Her renin was consistently <10 mU/L and aldosterone in a near normal range: 150 to 300 pmol/L. Meanwhile, her sister was evaluated for an adrenal finding, elsewhere. Confirmatory testing for primary aldosteronism was positive and glucocorticoid remediable aldosteronism test was negative.

MRI adrenal showed bilateral (B/L) adrenal adenomas, left: 20mm left and right: 11mm. The patient underwent adrenal venous sampling (AVS), with a clear lateralisation to right, lateralization index of 229:1(R: L). The patient underwent right-sided adrenalectomy as per AVS results, successfully. Post-surgery her BP normalised and 18 months later continues to demonstrate a sustained 'cure' response.

CS-02 - I Found One, Two, Three, Four Secondary Causes of Hypertension: Which One Should I Treat?

Dr Jack Thompson[1], Dr Luca Faconti[1], [1]Guy's and St Thomas' NHS trust

Introduction:

CJ, a 29-year-old South-Asian woman recently diagnosed with stage 1 hypertension, was investigated before commencing pharmacological treatment. Despite entirely normal physical examination and biochemistry tests, aorta MRA revealed a 6mm left adrenal nodule, a low grade mid-aortic syndrome, a right renal artery stenosis and atrophy and scarring of the left kidney. Extensive diagnostic workup lead us to exclude functionality of the adrenal lesion and a MAG3 renogram demonstrated residual functionality of the smaller left kidney (26%). The cause of the renal problem was identified as vesicoureteric reflux which will be treated by robotic-assisted laparoscopic left tapered ureteric reimplantation. The contribution of mid-aortic syndrome and right renal artery stenosis to hypertension needs further investigation with dedicated invasive arterial pressure measurement since (similarly to fibromuscular dysplasia) creatinine, renin and aldosterone can often be normal especially in the early stage.

CS-03 - Unveiling Primary Aldosteronism in Hypertensive Heart Failure

Dr Joanna Gray[1], Dr Sahan Mendis[1], Dr Joseph Cheriyan[1], Dr Spoorthy Kulkarni[2], Professor Ian Wilkinson[2], [1]Cambridge University Hospitals NHS Foundation Trust, [2]University of Cambridge

Introduction:

Diagnosing primary aldosteronism as a cause for hypertension in patients presenting with hypertensive heart failure is challenging. This 29-year-old man presented with subacute onset of dyspnoea, orthopnoea and paroxysmal nocturnal dyspnoea with uncontrolled hypertension. Excess alcohol, smoking, poor lifestyle, obesity, newly diagnosed diabetes mellitus and family history of hypertension were risk factors present on admission. Investigations confirmed hypertensive heart failure with no contributory congenital, valvular heart disease or concomitant coronary artery disease. This hypertensive emergency was managed with diuretics and nitrates with further addition of a beta-blocker, ACE inhibitor, mineralocorticoid antagonist and sodium-glucose co-transporter inhibitor, which resulted in complete resolution of heart failure, hypertension, and echocardiographic findings. Raised aldosterone and unilateral adrenal lesion on radiological imaging suggested primary aldosteronism (PA). Adrenal venous sampling confirmed PA with unilateral involvement. Patient underwent adrenalectomy but found no histopathological evidence of adrenal adenoma. However, subsequent clinical response of hypertension was satisfactory.

O-01 - Vascular Remodelling in the Physician-Optimised Postpartum Hypertension Treatment Trial: Secondary Analysis of the POP-HT Randomized Trial

Dr Jamie Kitt[1], Prof Paul Leeson[1], Prof Richard McManus[2], Mr Samuel Krasner[1], Mr Paul Bateman[2,]
[1]Division of Cardiovascular Medicine, Radcliffe Department of Medicine, University of Oxford, Oxford, UK., [2]Nuffield Department of Primary Care Health Sciences, University of Oxford

Introduction:

The Post-Partum Hypertension Trial (POP-HT) demonstrated that better blood pressure control in the immediate postpartum period, following a hypertensive pregnancy, results in persistently lower blood pressure,1 and beneficial cardiac remodelling,2 9 months later. Vascular measures were included as pre-specified secondary outcomes3 to determine the impact of the intervention on central arterial stiffness.

Methods:

POP-HT was a prospective, randomized, blinded outcome trial run in a single UK centre between March 2020 and December 2022.1 Participants were randomized to either remote telemonitored blood pressure self-management or standard NHS care post-partum. Aortic stiffness was measured at baseline and ~9-month post-partum using a calibrated Vicorder® oscillometric device,4-6 with brachial and femoral cuffs, to derive central (aortic) blood pressure and brachial-femoral pulse wave velocity. Additionally, aortic distensibility was assessed by cardiovascular magnetic resonance (3T Siemens PRISMA®) using an 18-channel body and spine matrix coils to assess ascending and descending aortic distension at main pulmonary artery level adjusted for sequentially measured aortic blood pressure.3

Results:

Of 220 participants, baseline Vicorder® measures were available for 219 and 194 at follow up (102 intervention; 92 standard care). There were no baseline differences but aortic diastolic blood pressure (difference -5.21mmHg; 95% CI -8.0 to 2.21; p=<0.001) and pulse wave velocity, adjusted for blood pressure, (difference -0.71m/s (95% CI -1.42 to -0.006; p=0.048) were lower in the intervention group at follow up, which corresponded with improved aortic distensibility measured by cardiovascular magnetic resonance (CMR). Measures were adjusted for aortic blood pressure at time of CMR.

Conclusions:

This secondary analysis of the POP-HT randomised trial shows that, in addition to previously reported improvements in blood pressure and cardiac remodelling, improved blood pressure control immediately post-partum, achieved through remote monitoring and blood pressure self-management, also had benefits on central arterial stiffness for up to nine months post-partum after a hypertensive pregnancy.

Disclosures:

Dr Jamie Kitt was funded by a BHF CRT-F during the POP-HT trial. Paul Leeson is a founder and shareholder of a healthcare imaging company and a named inventor on patents related to cardiovascular imaging. Richard McManus has received BP monitors for research from Omron and has worked with Omron and Sensyne on telemonitoring interventions for which licensing and consultancy fees have been paid to the University of Oxford.

References:

1. **Kitt J**, Fox R, Frost A, Shanyinde M, Tucker K, Bateman PA, Suriano K, Kenworthy Y, McCourt A, Woodward W, Lapidaire W, Lacharie M, Santos M, Roman C, Mackillop L, Delles C, Thilaganathan B, Chappell LC, Lewandowski AJ, **McManus RJ**, **Leeson P**. Long-Term Blood Pressure Control After Hypertensive Pregnancy Following Physician-Optimized Self-Management: The POP-HT Randomized Clinical Trial. JAMA. 2023 Nov 28;330(20):1991-1999. doi: 10.1001/jama.2023.21523. PMID: 37950919; PMCID: PMC10640702.
2. **Kitt J**, Krasner S, Barr L, Frost A, Tucker K, Bateman PA, Suriano Kenworthy Y, Lapidaire W, Lacharie M, Mills R, Roman C, Mackillop L, Cairns A, Aye C, Ferreira V, Piechnik S, Lukaschuk E, Thilaganathan B, Chappell LC, Lewandowski AJ, **McManus RJ**, **Leeson P**. Cardiac Remodeling After Hypertensive Pregnancy Following Physician-Optimized Blood Pressure Self-Management: The POP-HT Randomized Clinical Trial Imaging Sub-study. Circulation. 2024 Feb 13;149(7):529-541. doi:10.1161/CIRCULATIONAHA.123.067597. Epub Nov 11. PMID: 37950907
3. **Kitt J**, Frost A, Mollison J, Tucker KL, Suriano K, Kenworthy Y, McCourt A, Woodward W, Tan C, Lapidaire W, Mills R, Lacharie M, Tunnicliffe EM, Raman B, Santos M, Roman C, Hanssen H,Mackillop L, Cairns A, Thilaganathan B, Chappell L, Aye C, Lewandowski AJ, **McManus RJ**, **Leeson P**. Postpartum blood pressure self-management following hypertensive pregnancy: protocol of the Physician Optimised Postpartum Hypertension Treatment (POPHT) trial. BMJ Open. 2022 Feb 23;12(2):e051180. doi: 10.1136/bmjopen-2021-051180. PMID: 35197335; PMCID: PMC8867381.
4. Hickson, S.S., et al., Validity and repeatability of the Vicorder apparatus: a comparison with the SphygmoCor device. Hypertens Res, 2009. 32(12): p. 1079-85.
5. Kracht, D., et al., Validating a new oscillometric device for aortic pulse wave velocity measurements in children and adolescents. Am J Hypertens, 2011. 24(12): p. 1294-9.
6. Milan, A., et al., Current assessment of pulse wave velocity: comprehensive review of validation studies. J Hypertens, 2019. 37(8): p. 1547-1557.

O-02 - Haemodynamic Links Between Body Mass Index and Systolic Blood Pressure: Variations by Age and Sex in the Anglo-Cardiff Collaborative Trial

Dr Domonkos Cseh[1], Dr Yasmin[1], Professor Barry McDonnell[2], Professor John Cockcroft[2], Professor Ian Wilkinson[1], Dr Carmel McEniery[1, 1]University Of Cambridge, Division of Experimental Medicine and Immunotherapeutics, [2]Cardiff Metropolitan University, Cardiff School of Sport and Health Sciences

Introduction:

The relationship between body mass index (BMI) and systolic blood pressure (SBP) is well-established, however, the haemodynamic mechanisms driving this association in different age and sex groups remain to be fully understood.

Methods:

Detailed anthropometric and haemodynamic data were obtained from 3956 adults (4 groups: 1080 men and 1131 women <30 years; 755 men and 990 women >60 years). Blood pressure, cardiac output (CO) and peripheral vascular resistance (PVR) were determined. Linear regression analyses were performed to assess the haemodynamic variables underlying the BMI-SBP association within groups. Additionally, participants were stratified into BMI tertiles within each group, with SBP values compared between upper and lower CO and PVR tertiles within BMI categories.

Results:

BMI and SBP were positively associated in all groups, although this was weaker in older individuals (β=0.968 and β=0.977 for young men and women, respectively; β=0.643 and β=0.473 for older men and women, respectively; $p<0.001$ for all). In young men and women, higher CO was associated with higher SBP in all BMI tertiles, and higher PVR with higher SBP in the upper BMI tertile (men) and the middle and upper BMI tertiles (women). Furthermore, in regression models, there was a negative BMI-CO interaction and a positive BMI-PVR interaction overall. In older men and women, higher PVR, not CO, stratified SBP across all BMI tertiles. In line with this, there was no BMI-CO interaction. However, there was a weak but significant positive BMI-PVR interaction.

Conclusions:

These results indicate significant age- and sex-specific differences in the haemodynamic pathways linking BMI to SBP. In young individuals, the influence of CO on SBP decreases with increasing BMI, while the opposite is true for PVR, particularly in females. In older individuals, CO has no influence and PVR only a moderate influence on the association between BMI and SBP.

O-03 - Inappropriate Pulse Wave Velocity Relative to Blood Pressure Level: Definition and Clinical Determinants

Miss Dellaneira Setjiadi[1], Professor Christian Delles[1], Professor Pierre Boutouyrie[2], Professor Rosa Maria Bruno[2, 1]University Of Glasgow, [2]Faculté de Médecine, Université de Paris, INSERM U970, Hôpital européen Georges Pompidou, Assistance Publique Hôpitaux de Paris

Introduction:

Despite the established relationship between blood pressure (BP) level and hypertension-mediated organ damage (HMOD) severity, a disproportional degree of HMOD in relation to BP can be observed in some patients with hypertension. This study aims to describe the characteristics of individuals with inappropriate arterial stiffness measured by pulse wave velocity (PWV) relative to their BP levels.

Methods:

This observational monocentric cohort study utilised data from Hôpital européen Georges-Pompidou (HEGP), Assistance Publique-Hôpitaux de Paris (APHP) that includes 5,186 (57.2% male, mean age 53 years) participants. 1,203 participants had a second PWV measurement after a median of 2.1 years. Residuals from log-transformed piecewise regression model for PWV prediction based on mean arterial pressure (MAP) were employed to define participants with inappropriate PWV. A multinomial regression analysis was conducted to find the associated clinical characteristics.

Results:

There are 522 participants with inappropriately high PWV and 517 participants with inappropriately low PWV, defined as 10th and 90th percentile of residuals. In the multinomial analysis, younger age, higher body mass index (BMI), and presence of diabetes mellitus (DM) are associated with inappropriately high PWV. In participants with follow-up visit, classification into groups of inappropriate PWV was consistent, with 78% concordance.

Conclusions:

This study generates a classification method to define inappropriate HMOD relative to BP levels. Screening especially of younger patients for HMOD irrespective of their BP level may lead to early detection of organ damage and identifications of patients for targeted preventive strategies.

O-04 - Influence of Gender and Ethnicity on Hypertension Mediated Organ Damage: Intersectionality Analysis in A Dual Ethnic Series of Hypertensive Patients

Dr Anna Hernandez-Rubio[1], Nuria Pedros Barnils[2], Dr Ryan McNally[1], Bushra Farukh[1], Prof Robert Muga[3], Prof Phil Chowienczyk[1], Prof J Kennedy Cruickshank[1], Dr Luca Faconti[1,] [1]King's College London British Heart Foundation Centre, School of Cardiovascular and Metabolic Medicine & Sciences, [2]Institute for Public Health and Nursing Research, University of Bremen, [3]Autonomous University of Barcelona, University Hospital Germans Trias i Pujol

Introduction:

Influence of gender and ethnicity on hypertension-mediated organ damage (HMOD) is still debated. It has been suggested that black people and post-menopausal women could be more at risk of vascular and kidney damage, but it is unclear if it is due to biological differences or confounders.

Methods:

An intersectional analysis of a dual-ethnic series of hypertensive patients included anthropometric, biochemistry data and information on vascular (carotid-femoral pulse wave velocity (cf-PWV)) and renal HMOD (microalbuminuria/decreased glomerular filtration rate). Multivariate logistic and linear regression were used to study the relationship between the intersectional categories with kidney damage and cf-PWV.

Results:

654 hypertensive patients, age (mean ± SD) 46±13 years were divided into four intersectional categories (163 black women, 187 black men, 87 white women, 217 white men).
Blood pressure was higher in black men (152±19/ 93±14 mmHg) followed by black women (148±19/ 91±11 mmHg), white men (145±16/ 88±11 mmHg), and white women (142±17/ 90 ±13 mmHg), $P<0.01$. Unadjusted cf-PWV was higher in black women 10.4±2.5m/s and men 10.1±2.3m/s compared to white women 9.9±2.1m/s and men 9.4±2.2m/s, ANOVA $P<0.01$. Prevalence of kidney damage was higher in black women 27.6% and men 34.2% compared to white women 10.3% and men 14.3%, Chi-Squared $P<0.01$. Multivariate analysis adjusted for age, BMI, blood pressure, heart rate, diabetes, dyslipidaemia, pharmacological treatment, smoking, aldosterone/renin ratio and renal function showed that women of both ethnicities had higher cf-PWV (white (β= 0.7m/s, p=0.030), black (β= 0.5m/s, p=0.046)) compared to white men used as reference. Odds ratios (95% Confidence Intervals (CI)) of kidney damage were higher in black subjects of both gender (women (3.5(1.3-9.5), men 4.3(1.7-11.0) respectively, $P<0.05$) compared to white women.

Conclusions:

Intersectionality analysis suggests that hypertensive women could be more prone to develop HMOD at vascular level whilst black individuals have higher risk of developing kidney damage.

Disclosures:

None.

O-05 - Impact of Intensive Blood Pressure Control on Systolic Function in Children with CKD in the HOT-KID Trial

Dr Haotian Gu[1], Professor John Simpson[2], Professor Phil Chowienczyk[1], Professor Manish Sinha[1]
[1]King's College London, [2]Evelina London Children's Hospital

Introduction:

Relationship between blood pressure (BP) control and left ventricular (LV) systolic function in children with chronic kidney disease (CKD) is uncertain. The aim is to investigate whether achieving lower BP control yields a favourable impact on systolic function by performing a exploratory analysis utilising data from the HOT-KID randomised controlled trial (RCT) in children with CKD (ISRCTN25006406). 1

Methods:

124 children were randomised to standard (50th-75th percentile) or intensive (<40th percentile) systolic blood pressure using office BP targets. Echocardiograms were performed at baseline and at follow-up visits. Systolic function was assessed from echocardiographic measures of ejection fraction (EF), Tissue Doppler lateral and septal S waves, Global Longitudinal Strain (GSL) and first-phase ejection fraction (EF1) by a blinded observer.

Results:

At baseline, there was no significant difference of EF, S waves, GLS and EF1 between standard and intensive treatment groups. There was significant average annual rate of change in GLS (difference in means 0.39% per year, 95% CI: 0.107 to 0.68, P=0.007) (table 1a and figure 1a) and EF1 (difference in means -0.97% per year, 95% CI -1.44 to -0.50, P<0.001) (table 1b and figure 1b) in the standard compared to the intensive treatment arm. However, the average annual changes in all other systolic function measures were similar between standard and intensive treatment groups.

Conclusions:

Achieving lower blood pressure control has a favourable impact on early LV systolic function as measured by EF1 and longitudinal function as measured by GLS in children with CKD.

Disclosures:

None

References:

1. Sinha MD, Gu H, Douiri A, Cansick J, Finlay E, Gilbert R, Kerecuk L, Lunn A, Maxwell H, Morgan H, et al. Intensive compared with less intensive blood pressure control to prevent adverse cardiac remodelling in children with chronic kidney disease (hot-kid): A parallel-group, open-label, multicentre, randomised, controlled trial. *Lancet Child Adolesc Health*. 2023;7:26-36

Table 1: Systolic function measures over time.

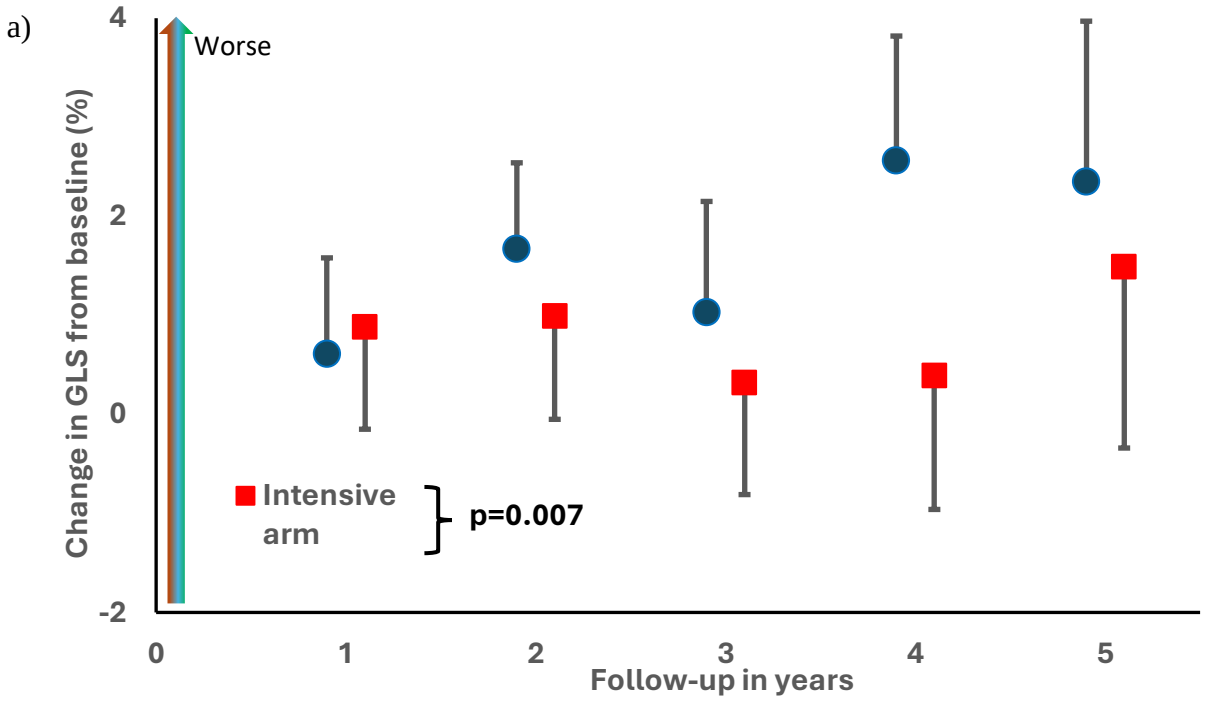
A: Change in mean GLS (%) from baseline.

GLS (%)	Intensive arm	Standard arm	Difference (CI)	P
Change in per year, mean (95%, CI)	0.20 (0.003, 0.40)	0.60 (0.39, 0.80)	0.39 (0.107, 0.68)	**0.007**
Baseline (n=64, 60)	-17.2 (-18.0, -16.5)	-17.1 (-17.7, -16.4)	0.15 (-0.82, 1.12)	
Y1 (n=51, 54)	-16.4 (-17.1, -15.6)	-16.5 (-17.2, -15.7)	-0.12 (-1.14, 0.90)	0.814
Y2 (n=47, 47)	-16.2 (-16.9, -15.5)	-15.4 (-15.9, -14.8)	0.83 (-0.07, 1.72)	0.069
Y3 (n=36, 32)	-16.9 (-17.7, -16.1)	-16.0 (-17.0, -15.1)	0.86 (-0.35, 2.08)	0.161
Y4 (n=23, 22)	-16.8 (-17.8, -15.8)	-14.5 (-15.7, -13.3)	2.32 (0.80, 3.83)	**0.004**
Y5 (n=11, 11)	-15.7 (-16.9, -14.6)	-14.7 (-16.3, -13.1)	1.00 (-0.86, 2.88)	0.273

B: Change in mean EF1 (%) from baseline.

EF1 (%)	Intensive arm	Standard arm	Difference (CI)	P
Change in per year, mean (95%, CI)	1.05 (0.73, 1.38)	0.08 (-0.26, 0.42)	-0.97 (-1.44, -0.50)	**<0.001**
Baseline (n=64, 60)	19.8 (18.6, 21.0)	20.1 (18.8, 21.4)	0.30(-1.45, 2.06)	
Y1 (n=51, 54)	21.7 (20.3, 23.1)	20.6 (19.6, 22.1)	-0.87 (-2.73, 0.98)	0.353
Y2 (n=47, 47)	22.3 (21.1, 23.5)	21.1 (19.7, 22.5)	-1.17 (-3.00, 0.66)	0.207
Y3 (n=36, 32)	23.9 (22.4, 25.4)	20.8 (18.8, 22.8)	-3.14 (-5.58, -0.72)	**0.012**
Y4 (n=23, 22)	23.6 (22.0, 25.2)	19.3 (17.7, 21.0)	-4.25 (-6.47, -2.03)	**<0.001**
Y5 (n=11, 11)	22.8 (21.1, 24.6)	18.3 (16.1, 20.5)	-4.55 (-7.18, -1.92)	**0.002**

P value denotes difference in means for change in each variable per year between two trial arms, standard vs. intensive for all the data. Means were estimated by use of a linear mixed effects model for repeated measures. At the final follow up visit the majority of patients had not reached 5 years of study participation, which accounts for the sharp decrease in numbers available for follow-up between year 4 and 5.


a)
Worse
Change in GLS from baseline (%)
4
2
0
-2
Intensive arm
p=0.007
0
1
2
3
4
5
Follow-up in years

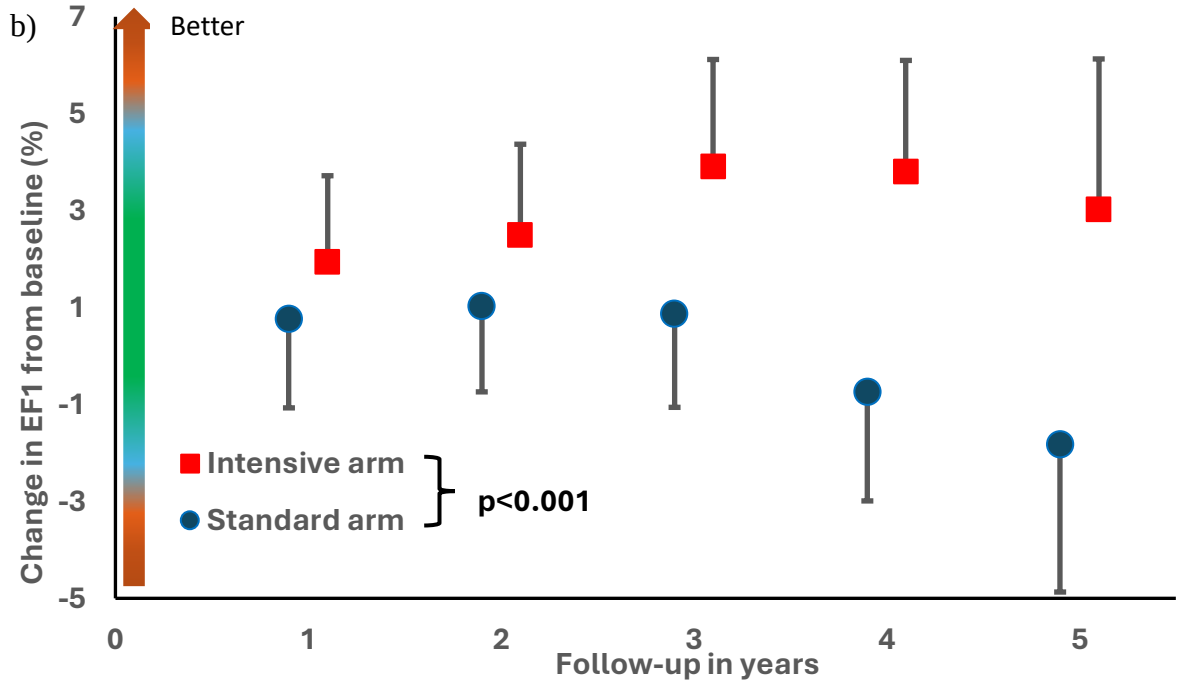

b)
Better
Change in EF1 from baseline (%)
7
5
3
1
-1
-3
-5
Intensive arm
Standard arm
p<0.001
0
1
2
3
4
5
Follow-up in years

Figure 1

O-06 - An Exploratory Analysis of the Effect of Semaglutide on Blood Pressure using a Treatment Intensity Score

Dr Cormac Kennedy[1], Dr Peter Hayes[2], Professor Arrigo Cicero[3], Dr Stephan Dobner[4], Professor Carel Le Roux[5], Professor John W McEvoy[6], Professor Lina Zgaga[1], Professor Martina Hennessy[1, 1]School of Medicine, Trinity College Dublin, [2]University of Limerick, [3]University of Bologna, [4]Clinic Ottakring, [5]University College Dublin, [6]University of Galway

Introduction:

The effect of an intervention on BP is determined by measurements. However, adjustments to anti-hypertensive medications may indicate additional effects, but these are not captured in outcomes. We aimed to determine the total effect - measured change in BP and anti-hypertensive adjustments - of semaglutide on SBP for hypertensive participants using data from large RCTs and a treatment intensity score (TIS).

Methods:

Access to participant level data was approved by the sponsor's independent review board for the STEP 1, 3 and 4 trials. All trials compared semaglutide 2.4mg to placebo in patients without diabetes. Those with hypertension were identified by baseline BP (>130/80 mmHg), anti-hypertensive treatments and/or a hypertension diagnosis. Adjustments to anti-hypertensive treatments (escalated if started/increased dose, de-escalated if stopped/decreased dose) and change in TIS were determined for treatment arms.1 The between arm difference in measured SBP change and TIS change was estimated using ANCOVA adjusted for baseline SBP.

Results:

2050 participants met the criteria for hypertension. Baseline SBP was 130mmHg for both arms. The difference in SBP change between semaglutide and placebo for patients with hypertension was -4.78mmHg (95%CI -5.97 to -3.59, p<0.001). Escalation of anti-hypertensive treatment occurred in 5.7% for semaglutide versus 7.6% on placebo (OR 0.73; 95%CI 0.50 to 1.08, p=0.112), while de-escalation occurred in 10.9% versus 5.2% (OR 2.38; 95%CI 1.63 to 3.56, p<0.001). For change in TIS, the mean difference for semaglutide and placebo was -0.54 (95%CI -0.74 to -0.33, p<0.001).

Conclusions:

Treatment with semaglutide resulted in a clinically significant reduction in SBP. In addition, there was a de-escalation of half a standard anti-hypertensive dose due to semaglutide. The total BP lowering effect should be considered when treating patients with semaglutide and similar anti-obesity agents.

Disclosures:

None.

References:

1. Min L, Ha J-K, Aubert CE, et al. JAMA Network Open 2021;4:e2034059.

O-07 - Predicting the Risk of Electrolyte Abnormalities in Patients Indicated for Antihypertensive therapy: development and External Validation of the STRATIFY-Hyperkalaemia and STRATIFY-Hyponatraemia Prediction Models

Dr Ariel Wang[1], Dr Constantinos Koshiaris[2], Dr Lucinda Archer[3], Prof Richard D Riley[3], Dr Kym IE Snell[3], Dr Richard Stevens[1], Prof Amitava Banerjee[4], Dr Juliet A Usher-Smith[5], Dr Subhashisa Swain[1], Prof Andrew Clegg[6], Dr Christopher E Clark[7], Prof Rupert A Payne[7], Prof Richard FD Hobbs[1], Prof Richard J McManus[1], Dr James P Sheppard[1,] [1]Nuffield Department of Primary Care Health Sciences, University Of Oxford, [2]Medical School, University of Nicosia, [3]Institute of Applied Health Research, The University of Birmingham; National Institute for Health and Care Research (NIHR) Birmingham Biomedical Research Centre, [4]Institute of Health Informatics, University College London, [5]Primary Care Unit, Department of Public Health and Primary Care, University of Cambridge, [6]Academic Unit for Ageing and Stroke Research, Bradford Institute for Health Research, University of Leeds, [7]Exeter Collaboration for Academic Primary Care, University of Exeter Medical School

Introduction:

Evidence from clinical trials suggests that antihypertensive treatment is associated with an increased risk of common electrolyte disorders. We aimed to develop and validate two clinical prediction models to estimate the risk of hyperkalaemia or hyponatraemia events to facilitate targeted treatment strategies in individuals indicated for antihypertensive therapy.

Methods:

This study used primary care data from the Clinical Practice Research Datalink (CPRD). Individuals aged≥40 years with at least one systolic blood pressure measurement between 130-179mmHg were included. Primary outcomes were first hyperkalaemia or hyponatraemia event recorded in primary or secondary care. Model development used a Fine-Gray approach with death from other causes as competing event. Model performance was assessed with C-statistic and Observed/Expected (O/E) ratio upon external validation.

Results:

The development cohort included 1,773,224 patients (mean age=59 years, median follow-up=6 years), with 3,805,366 patients (mean age=59 years, median follow-up=7 years) in the validation cohort. The hyperkalaemia model contained 23 predictors and the hyponatraemia model contained 29 predictors, with all antihypertensive medications associated with the outcomes of interest. Both models exhibited excellent calibration and good discrimination upon external validation at 10 years (hyperkalaemia model: O/E ratio 1.16, 95% confidence interval [CI] 1.13~1.19; C-statistic: 0.69, 95%CI: 0.69~0.69) (hyponatraemia model: O/E ratio 1.00, 95%CI: 0.98~1.02; C-statistic: 0.80, 95%CI: 0.80~0.80). Most individuals at low-cardiovascular disease (CVD)-risk, as measured by Qrisk2, were also at a low risk of hyperkalaemia or hyponatraemia when using a 10% risk threshold, while nearly 40% of high-CVD-risk individuals were at high risk of both.

Conclusions:

These clinical prediction models could assist clinicians in selecting appropriate/alternative classes of antihypertensive medications when the risk of harm is high. Regular blood investigations for simple electrolytes are recommended for individuals at high risk.

Disclosures:

The STRATIFY project is supported by the Welcome Trust/Royal Society via a Sir Henry Dale Fellowship.

O-08 - Longitudinal Reduction in Blood Pressure does not Reduce Arterial Stiffness

Dr Alena Shantsila[1], Dr Eduard Shantsila, Prof Yalin Zheng, Prof Gregory YH Lip, [1]University Of Liverpool

Introduction:

Hypertension accelerates arterial stiffening, a biomarker of ageing. High blood pressure (BP) and arterial stiffness interact, amplifying their impact on target organ damage. It is unclear whether BP reduction can slowdown arterial stiffening. The analysis aims to explore this.

Methods:

The study analysed UK Biobank (ID 54078) data (baseline n=169,680, age range 40-72, median age 59, 52% women, 28% had hypertension). Arterial stiffness was measured using Arterial Stiffness Index (ASI, m/sec, PulseTrace PCA2, CareFusion, USA) and repeated after median 3.0 [2.8-3.3] years (n=4,396), simultaneously with BP (mmHg). Multivariable linear regression was used to test association between BP and ASI changes, adjusted for age, sex, diabetes, baseline BP and BP-lowering drug use. ROC analysis was used to determine BP cut-offs for ASI improvement (reduction). Continuous data are presented as median [interquartile range] and compared using Wilcoxon text. R software was used.

Results:

Higher baseline ASI quartiles showed higher systolic BP (SBP, Q1 134 [121-148], Q2 134 [123-146], Q3 137 [126-149], Q4 142 [130-154], $p<0.001$) and diastolic BP (DBP, Q1 80 [73-87], 81 [74-88], 82 [76-89], 85 [79-92], $p<0.001$). SBP did not change (0 [-8 - 8]), DBP reduced (-1.0 [-6.0 - 3.5]) and ASI increased (0.55 [-1.49 - 2.78]) during follow-up. DBP reduction was independently associated with ASI increased (B±SE 0.04±0.01, $p<0.001$), while SBP changes did not affect ASI (0.004±0.006, $p=0.51$). DBP changes predicted the magnitude of ASI changes (AUC 0.53, 95%CI 0.51-0.55, $p<0.001$), with a DBP reduction of 6.3 mmHg being the best cut-off for ASI increase.

Conclusions:

Although higher baseline BP was associated with higher arterial stiffness, longitudinal SBP reduction did not improve arterial stiffness. While DBP reduction was related to arterial stiffening, the data do not show the direction of causation; increased arterial stiffness itself likely leads to DBP reduction.

Disclosures:

None

O-09 - Circulating Monocyte Phenotype: A Novel Biomarker of Atherosclerosis

Dr Fatemah Almarri[1], Dr Alexander Kerr[1], Dr Soundrie Padayachee[2], Dr Ashish Patel[1], Professor Albert Ferro[1, 1]King's College London, [2]Guy's and St Thomas' Hospitals

Introduction:

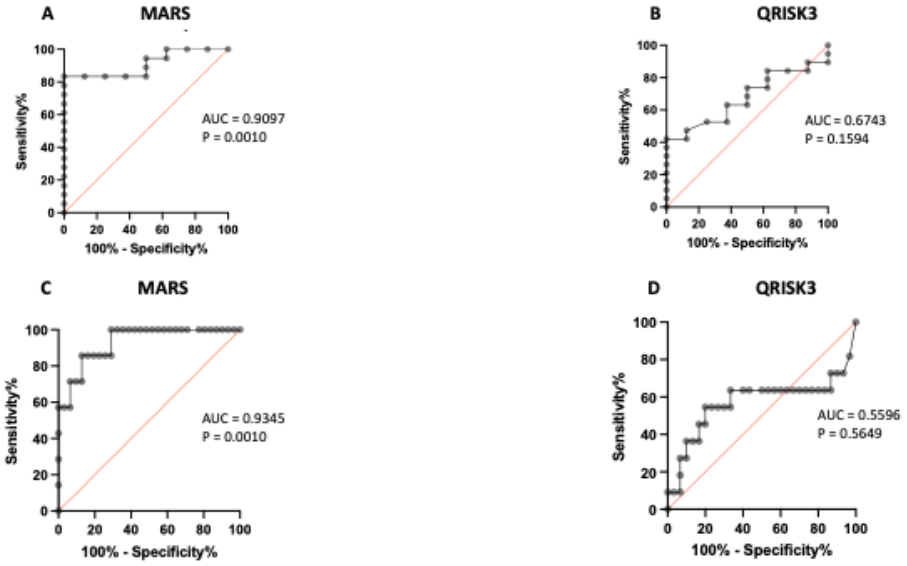
Inflammation plays a crucial role in the development of atherosclerosis, the principal cause of coronary heart, cerebrovascular and peripheral arterial diseases. Certain blood biomarkers, including monocyte-platelet aggregates (MPA) and CD14++/ CD16+ monocytes, have been found to be elevated in symptomatic patients. We hypothesised that these biomarkers may be useful in prediction of early atherosclerosis in asymptomatic subjects; and that they may be superior to traditional cardiovascular risk calculators, which are highly predictive of disease at a population level but less so at an individual level.

Methods:

Blood (30 mL) from asymptomatic subjects subjects (n = 42) was processed for flow cytometry to measure CD14 and CD16 expression on monocytes and CD14+CD42b+ particles as an index of MPA. Using these measurements, we developed a novel index of atherosclerotic risk which we termed the Monocyte Atherosclerotic Risk Score (MARS). To assess atherosclerotic burden in each individual, carotid artery ultrasonography was performed to assess carotid intima-media thickness (cIMT) as well as presence of plaque. All subjects also had 10 year cardiovascular risk assessed using QRISK3 (https://qrisk.org).

Results:

Both QRISK3 and MARS exhibited significant correlations with cIMT; however, the correlation was much closer for MARS ($r^2 = 0.8705$, $p < 0.0001$) than for QRISK3 ($r^2 = 0.3012$, $p = 0.0025$). Receiver operating characteristic analysis revealed MARS to be highly predictive of cIMT-determined high risk in individual subjects (Figure A), whereas QRISK3 was not (Figure B); and similarly, MARS was highly predictive of the presence of plaque disease (Figure C), whereas QRISK3 was not (Figure D).



Conclusions:

MARS is a novel precision diagnostic which offers superiority over QRISK3 in predicting cardiovascular risk at a personalised level, as defined objectively by cIMT. This may help to better identify asymptomatic individuals who would benefit from targeted imaging investigations and prophylactic therapies.

Disclosures:

None.

O-10 - Improved Prediction of Hypertension Across Different Ancestry Populations from a Genetic Study of over 1 Million People

Dr Helen Warren[1,2], Jacob Keaton[3,4], Tian Xie[5], Zoha Kamali[5,6], Ahmad Vaez[5,6], Daniel Levy[7], Todd Edwards[4], Patricia Munroe[1,2], Harold Snieder[5,] [1]Centre for Clinical Pharmacology and Precision Medicine, William Harvey Research Institute, Barts and The London School of Medicine and Dentistry, Queen Maty University of London, [2]NIHR Barts Cardiovascular Biomedical Research Centre, Barts and The London School of Medicine and Dentistry, Queen Mary University of London, [3]Center for Precision Health Research, NHGRI, [4]Division of Epidemiology, Department of Medicine, Vanderbilt University Medical Center, [5]Department of Epidemiology, University Medical Centre Groningen, University of Groningen, [6]Department of Bioinformatics, Isfahan University of Medical Sciences, [7]Population Sciences Branch, NHLBI Framingham Heart Study

Introduction:

Hypertension is caused by both lifestyle factors and genetics. Genetic analyses show blood pressure (BP) is a highly complex trait, influenced by thousands of different genetic variants. Polygenic risk scores (PRS) combine the effects of all genetic variants together, to predict overall disease risk.

Methods:

We developed PRS using data from the latest BP genetic analysis, which included >1 million individuals of European ancestry. We generated trait-specific PRS for systolic BP (SBP), diastolic BP (DBP), and pulse pressure (PP), using brand-new advanced PRS methodology. PRS were evaluated in the independent Lifelines cohort (N=10,210 European ancestry individuals), and tested for SBP, DBP, PP and hypertension. PRS analyses were also performed within N=21,843 African-American ancestry individuals from USA's All-Of-Us biobank.

Results:

The PRS now explains >60% of the heritability of BP attributable to common genetic variation. Comparing individuals in the top 10% of the PRS distribution with highest genetic risk vs those in the bottom decile with lowest risk, within the European cohort, shows a mean difference of 16.9 mmHg for SBP (95% CI 15.5-18.2 mm Hg, p=2.22×10-126), 10.3 mm Hg for DBP (95% CI 9.5-11.1 mm Hg, p=2.96×10-130), 10.0 mm Hg for PP (95% CI 9.1-11.0 mm Hg, p=3.11×10-94) and an odds ratio of 7.33 for hypertension (95% CI 5.54-9.70; p=4.13×10-44). The PRS is also significantly associated within the African-American ancestry sample: e.g. with sex-adjusted differences between top vs bottom deciles of the PRS of 10.6 mm Hg for SBP (95% CI 9.4-11.8 mm Hg, p=1.20×10-71).

Conclusions:

These BP-PRS can discriminate between patients according to their hypertension risk, and reveal clinically meaningful differences in BP. We also show utility of these BP-PRS in non-European populations, who have previously been underrepresented in genetic studies. Our BP-PRS may help clinicians identify at-risk individuals and facilitate early diagnosis and lifestyle intervention of hypertension.

Disclosures:

None.

O-12 - Mapping Individual Patient Dose-Response Journeys in the PERSONAL-COVIDBP Trial

Dr David Collier[1], Dr Mike Taylor[2], Dr Thomas Godec[2], Dr Julian Shiel[1], Dr Manish Saxena[1], Dr Paul Goldsmith[2], Mr Nicholas Deeming[3], Professor Neil R. Poulter[4], Professor Rhian Gabe[5], Professor Richard J. McManus[6], Professor Sir Mark J. Caulfield[1, 1]William Harvey Research Institute Queen Mary University of London, [2]Closed Loop Medicine , [3]TrialsConnect, [4]Imperial College London , [5]Wolfson Institute of Population Health, [6]University of Oxford

Introduction:

The PERSONAL-CovidBP study1 tested patient use of a drug-device combination of a smartphone application (App) to record blood pressure (BP), drug (amlodipine) dose, and relevant side effects daily during the COVID-19 pandemic. In supplementary data analyses, we examined individual patient dose-response journeys with respect to BP control, side effects and personalised dose titration**.**

Methods:

In this community-based trial with remote monitoring and remote medical management from the investigational site, hypertensive participants aged 18 years + with poor BP control (prior 7 day mean of 135 mmHg systolic BP or above and/or 85 mmHg diastolic BP or above) were enrolled to intervention with open label dose titration over 14 weeks, allowing personalized dosing of liquid amlodipine (1–2 mg steps from 1–10 mg daily).

Results:

205 patients were enrolled into the intervention group between October 2020 and July 2021. Average BP in intervention fell from 141/87 to 131/81 (difference −10/6 $p < 0.001$). Even low doses or small increments: 1 or 2 mg amlodipine or 5 mg to 6 mg, produced meaningful BP responses. Here we report. The majority of patients experienced dose limiting side effects (112/189 [59%]). Most of these patients (82/112 [73%]) achieved BP control and/or response (drop in SBP more than 10 mmHg and/or DBP more than 5 mmHg) at EOT through individualised dose adjustment with a greater number of patients being on a novel dose of amlodipine at EOT (45/82 [55%]).

Conclusions:

Our real-world remote care study demonstrated the value in a personalised approach to dose titration using novel intermediate doses of amlodipine. Personalized treatment titration reveals diverse participant experience of side effects and the ability to personalise dose optimizes both efficacy and adherence.

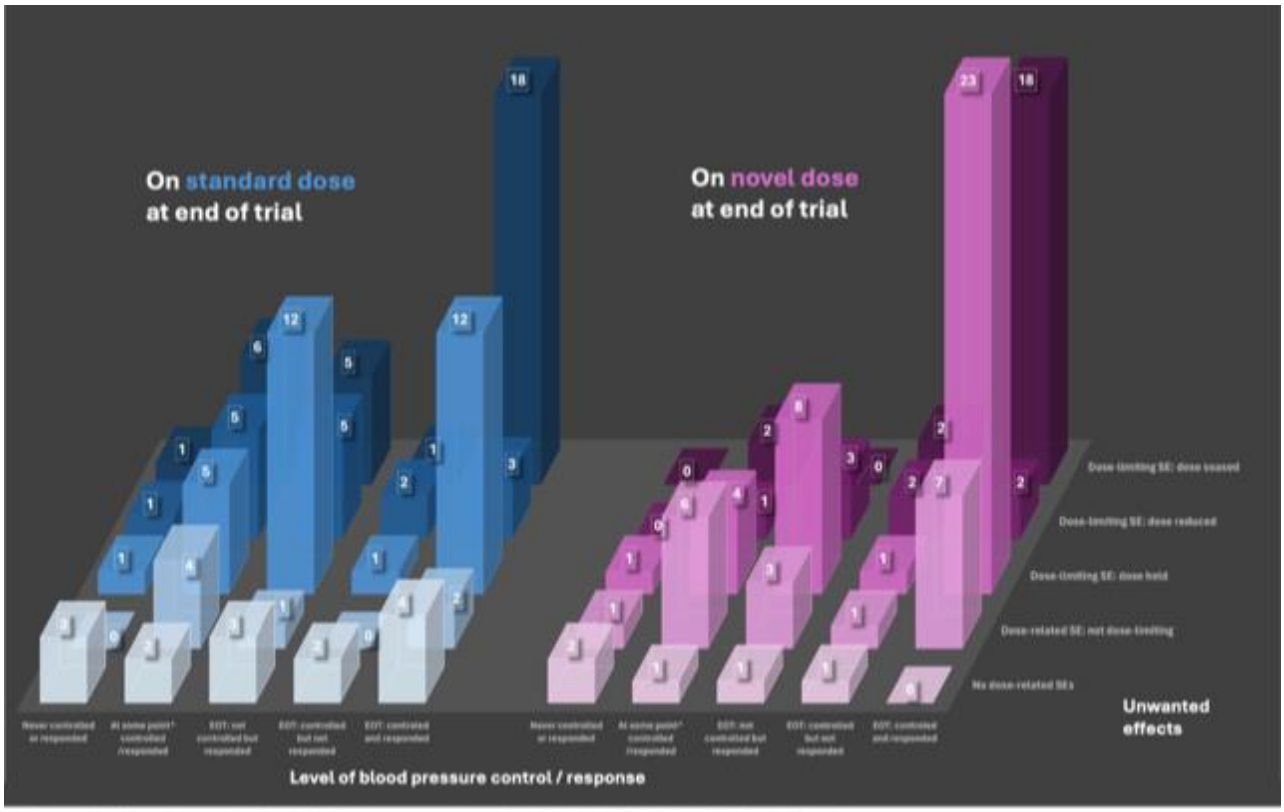
Disclosures:

MT, TG & PG are employees of Closed Loop Medicine

References:

1Collier DJ, Taylor M, Godec T, et al. J Am Heart Assoc. 2024 Feb 20;13(4):e030749. doi: 10.1161/JAHA.123.030749.

BIHS
British and Irish Hypertension Society
Committed to preventing cardiovascular disease



"Some point" refers to when a patient achieved BP control or response at some time during the trial follow-up but NOT at the end of the trial.
Responded: is defined as a blood pressure drop of 10 mmHg systolic and/or 5 mmHg diastolic. Controlled: is defined as having both a systolic less than 135 mmHg and a diastolic less than 85 mmHg.
EOT: end of trial (Week 14). Standard doses of amlodipine are 5 and 10 mg, while novel doses are 1, 2, 3, 4, 6, 7, 8, 9 mg doses (note that 1 patient was on the fractional dose 0.25 mg at the end of the trial).

O-13 - Supporting GPs and People with Hypertension to Maximise Medication use to Control Blood Pressure: A Pilot Cluster RCT of the MIAMI Intervention

Professor Andrew Murphy[1], Prof Gerry Molloy[1], Dr Eimear Morrissey[1], Ms Louise O'Grady[1,]
[1]University Of Galway

Introduction:

Recent international guidelines have stated that 'poor adherence to treatment – in addition to physician inertia – is the most important cause of poor blood pressure control.' The Maximising Adherence, Minimising Inertia (MIAMI) intervention is a theory-based complex intervention which aims to support GP's and people with hypertension to maximise medication use to control blood pressure. The aim of this pilot cluster randomised control trial (RCT) was to analyse feasibility data to allow us to (1) refine the MIAMI intervention, and (2) determine the feasibility of a definitive RCT.

Methods:

A pilot cluster RCT with MIAMI intervention arm and usual care control arms was conducted. Quantitative data collection consisting of clinical measures and a self-report questionnaire took place at baseline and twelve week follow up. Semi-structured interviews with GP and patient participants took place at the mid-point (6 weeks) and end (12 weeks) of the intervention. Fidelity and health economics costings were assessed.

Results:

Six GP practices (intervention arm n = 3, control arm n = 3) and 52 patients (intervention arm n = 25, control arm n = 27) took part. All six GP practices and 92% of patients were retained. Fidelity, as measured by a checklist and through qualitative interviews, was good but three deviations from protocol were identified. The implementation cost of the MIAMI intervention was estimated at €490 per participant. The qualitative data demonstrated that the intervention was considered acceptable and feasible by both GP and patient participants, except for the urine test component, which GP's found difficult to incorporate into practice due to logistical challenges.

Conclusions:

The MIAMI intervention was considered acceptable and largely feasible. Some changes to both intervention components and trial processes are required but with these in place a definitive RCT could be considered worthwhile.

Disclosures:

None

References:

Trial registration: ISRCTN85009436

O-14 - Associations Between Blood Pressure and Antiretroviral Therapy - A Sub-Study of the SPARTAC Trial

Mr Martin Tam[1], Dr Emanuela Falaschetti[2], Dr Sarah Partridge[3], Dr Spoorthy Kulkarni[1], Professor Sarah Fidler[2], Professor Jonathan Weber[2], Professor Ian Wilkinson[1], Professor Neil Poulter[2]
[1]University of Cambridge, [2]Imperial College London, [3]Brighton and Sussex Medical School

Introduction:

There is conflicting evidence regarding the associations between BP, HIV infection and antiretroviral therapy (ART) among HIV infected individuals, which has been compounded by inconsistent BP measurement in both observational and clinical HIV trials [1]. We were invited to conduct a BP sub-study of The Short Pulse Anti-Retroviral Therapy at Seroconversion (SPARTAC) trial [2]. We present data on the pre-specified primary outcome: the difference in mean diastolic BP between baseline and Week-12 among those randomised to ART versus no-ART.

Methods:

BP was measured at each study visit using a validated semi-automatic device (OMRON HEM-705CP), according to a standard protocol. Baseline demographics, CD4 count, and BP were reported in the ART treated (n=243) and no-ART group (n=123). The associations between BP and ART were evaluated using analysis of covariance.

Results:

Baseline characteristics: 60% men, median age 32 years (IQR 25-40), median CD4 count 559 cells/m3 (IQR 435-700), mean BP 120/72 mmHg (SD 14/10). ART regimen was predominately nucleoside reverse transcriptase inhibitor + protease inhibitor (86%). At Week-12, BP was lower in the ART treated vs the no-ART group and CD4 count was higher: 120/71 mmHg vs 122/74mmHg and 698 cell/mm3 vs 538 cell/mm3 respectively. At Week-12, the difference in BP between the ART treated and no-ART groups after adjustment for baseline BP and sex was 1.7/2.5 mmHg (95%CI -1.3 to 4.7/0.2 to 4.7); P=0.29/0.03).

Conclusions:

At Week-12 in the SPARTAC trial, BP was lower and CD4 count was higher in the ART-treated versus the no-ART group. Reduction in inflammation with ART may be one of the potential mechanisms for these observations.

Disclosures:

None.

References:

1. Feinstein MJ et al. Characteristics, Prevention, and Management of Cardiovascular Disease in People Living With HIV. Circulation 2019;140:e98–e124
2. The SPARTAC Trial Investigators. Short-Course Antiretroviral Therapy in Primary HIV Infection. NEJM 2013;368:207-217

O-15 - Does the Choice of Antihypertensive Drug Class Affect Arterial Stiffness? A Meta-Analysis of 6,200 Subjects and Comparison with an Acute Modulation of Transmural Pressure

Dr Ryan McNally[1], Dr Andrii Boguslavskyi[2], Miss Rayka Malek[1], Dr Christopher Floyd[1], Dr Marina Cecelja[1], Professor Abdel Douiri[1], Professor Rosa-Maria Bruno[3], Ms Bushra Farukh[1], Professor Phil Chowienczyk[1], Dr Luca Faconti[1,] [1]King's College London, [2]Guy's and St. Thomas' NHS Foundation Trust, [3]Université Paris Cité, INSERM U970 Team 7

Introduction:

Increased arterial stiffness and pulse wave velocity (PWV) of the aorta and large arteries imposes adverse haemodynamic effects on the heart and other organs. Antihypertensive treatment reduces PWV, but whether this results from an unloading of stiffer elements in the arterial wall or alternate functional changes that might differ according to class of drug is unclear.

Methods:

Study 1: Systematic review and meta-analysis of randomised controlled trials investigating the effects of different antihypertensive drugs on PWV to explore between-class differences (after adjustment for Δ mean arterial blood pressure (MAP)). Study 2: Patients recruited from the hypertension outpatient service at St. Thomas' Hospital, London to investigate changes in PWV after an acute change in transmural pressure (TMP) across the intrathoracic wall simulating an acute change in BP.

Results:

Study 1: 83 studies involving 6,200 subjects. In meta-regression analyses, reductions in PWV and MAP were significantly associated: reduction in PWV 0.65 [95% CI 0.46-0.83] m/s per 10mmHg reduction in MAP, P<0.001. All drug classes resulted in a significant decrease in PWV, with the largest decrease for ACE-inhibitors/Angiotensin receptor blockers (ACEi/ARB) (-1.23 [95% CI -1.4, -1.0] m/s, P<0.001) and smallest for diuretics (-0.62 [95% CI -0.97, -0.27] m/s, P<0.001). When adjusted for ΔMAP, reduction in PWV after treatment with beta blockers or diuretics was less than that after treatment with ACEi/ARB or calcium channel antagonists.

Study 2: 99 subjects were recruited and changes in PWV were strongly related to those of TMP with a change in PWV of 0.58m/s per 10mmHg change in TMP (95% CI 0.45, 0.7m/s per 10mmHg), P<0.001.

Conclusions:

Whilst the majority of the effect is mediated through reduction of BP, there are some class- specific effects that are likely to relate to a structural and/or functional change in the arterial wall that is independent of the change in BP.

Disclosures:

None.

O-16 - Prognostic Associations of Minnesota Coded ECG-Predicted Hypertension-Mediated Left Ventricular Hypertrophy in Anglo-Scandinavian Cardiac Outcomes Trial (ASCOT)

Dr Hafiz Naderi[1], Dr Julia Ramírez[2], Dr Stefan van Duijvenboden[3], Dr Esmeralda Ruiz Pujadas[4], Dr Nay Aung[1], Dr Lin Wang[5], Dr Anwar Chahal[6], Professor Neil Poulter[7], Professor Peter S Sever[8], Dr Ajay K Gupta[1], Professor Karim Lekadir[4], Professor Steffen E Petersen[1], Professor Patricia B Munroe[1,] [1]William Harvey Research Institute, Queen Mary University of London, [2]Aragon Institute of Engineering Research, University of Zaragoza, [3]Big Data Institute, La Ka Shing Centre for Health Information and Discovery, University of Oxford , [4]Faculty of Mathematics and Computer Science, University of Barcelona, [5]School of Electronic Engineering and Computer Science, Queen Mary University of London, [6]Center for Inherited Cardiovascular Diseases, WellSpan Health, [7]Imperial Clinical Trials Unit, Imperial College London, [8]National Heart and Lung Institute, Imperial College London.

Introduction:

Four hypertension-mediated left ventricular hypertrophy (LVH) phenotypes have been reported using cardiac magnetic resonance: normal LV, LV remodelling, eccentric and concentric LVH, with varying prognostic implications [1]. We previously developed and validated a machine learning (ML) model to classify these phenotypes using an extensive set of biomarkers derived from the electrocardiogram (ECG) in UK Biobank (UKB) [2]. This study aimed to compare whether a simplified model using Minnesota coded ECG led to similar classification performance, and to test for associations of the ECG-predicted LVH phenotypes with incident cardiovascular events in participants in the Anglo-Scandinavian Cardiac Outcomes Trial (ASCOT) [3].

Methods:

Seven Minnesota coded ECG biomarkers with physiological association with LVH (including Sokolow-Lyon and Cornell) were extracted from the 12-lead ECG of 20,439 hypertensives in UKB. A support vector machine (SVM) classifier was trained in 80% of participants and remaining 20% were included in the test set for performance measurement [4]. The trained ML model was used to classify LVH phenotypes in 17,959 hypertensives from ASCOT and test for associations between the ECG-predicted LVH groups and incident major adverse cardiovascular events (MACE) and heart failure using Cox proportional hazard regression with median follow-up of 4.5 years.

Results:

In UKB the SVM classifier had comparable performance to our extended ML model (Area under the receiver operator curve [AUC] 0.70 vs 0.69) with superior prediction of eccentric (AUC 0.80) and concentric LVH (0.70). In ASCOT, setting ECG-predicted normal LV as the reference group, ECG-predicted eccentric and concentric LVH groups were associated with heart failure (Hazard Ratio [HR] 1.46, 95% confidence interval [CI] 1.01-2.12 and HR 1.53, CI 1.07-2.19), and MACE (HR 1.14, CI 1.03-1.27, HR 1.29, CI 1.15-1.44), respectively.

Conclusions:

Minnesota coded ECG variables can classify hypertension-mediated LVH phenotypes using ML with adverse cardiovascular outcomes in ECG-predicted eccentric and concentric LVH groups.

Disclosures:

SEP provides consultancy to and owns stock of Cardiovascular Imaging Inc, Calgary, Alberta, Canada.

References:

1. Rodrigues JCL, Amadu AM, Dastidar AG, Szantho GV, Lyen SM, Godsave C *et al.* Comprehensive characterisation of hypertensive heart disease left ventricular phenotypes. Heart. 2016;102:1671–9. doi: 10.1136/heartjnl-2016-309576.
2. Naderi H, Ramírez J, van Duijvenboden S, Pujadas ER, Aung N, Wang L et al. Diagnostic and prognostic value of ECG-predicted hypertension-mediated left ventricular hypertrophy using machine learning. medRxiv. 2024. doi: 10.1101/2024.04.22.24306204
3. Sever PS, Dahlöf B, Poulter NR, Wedel H, Beevers G, Caulfied M, et al. Rationale, design, methods and baseline demography of participants of the Anglo-Scandinavian Cardiac Outcomes Trial. ASCOT investigators. Journal of hypertension. 2001;19. doi: 10.1097/00004872-200106000-00020
4. Naderi H, Ramírez J, van Duijvenboden S, Pujadas ER, Aung N, Wang L et al. Predicting left ventricular hypertrophy from the 12-lead electrocardiogram in the UK Biobank imaging study using machine learning. Eur Heart J Digit Health. doi: 10.1093/ehjdh/ztad037

O-17 - Quantification of Renin-Angiotensin System Peptides in Black and White Hypertensive and Normotensive Cohorts in The United Kingdom

Dr Spoorthy Kulkarni[1], Dr Luca Faconti[2], Mrs Evita Pappa[3], Mr. Giovanni Distefano[3], Dr Carmel McEniery[1], Prof. Philip Chowienczyk[2], Prof. Ian B. Wilkinson[1, 1]Department of Experimental Medicine and Immunotherapeutics, University of Cambridge, [2]Department of Clinical Pharmacology, King's College, London, [3]Department of Clinical Pharmacology, Cambridge University Hospitals NHS Foundation Trust

Introduction:

Black ethnic cohorts are known to have a low-renin phenotype, higher occurrence of salt-sensitive hypertension (HT), and a higher tendency for end-organ damage (1). Positive associations of blood pressure (BP) with aldosterone excess relative to renin have been shown in normotensive (NT) and HT black individuals in Africa (2). In this study, we evaluated differences in comprehensive renin-angiotensin-aldosterone system (RAAS) profiles between age-matched untreated HT and NT participants across black and white ethnicities in the UK.

Methods:

This was an exploratory sub-study analysis using baseline data from two study sites of the AIM HY-INFORM clinical trial was conducted. Age- and sex-matched NT controls were recruited from the community. Demographic, BP and biochemistry data including 24-hour urine electrolytes were assessed in HT and NT individuals: Black; n=45 (NT: 15, HT: 30) and White; n=44 (NT: 14, HT: 30), mean age: 34 (18-58). The RAAS fingerprint analysis (LC-MS/MS; Attoquant, Austria) included classical pathway peptides Ang II, Ang I, Ang III and Ang IV and alternative pathway peptides Ang-1-5 and Ang-1-7. Data were analysed using Mann-Whitney, Fisher's exact and Spearman's correlation.

Results:

Ang I, Ang II, and plasma renin were lower in the black versus white individuals ($p<0.01$), whilst the ratio of Ang II to Ang I, was similar. Plasma aldosterone, aldosterone-renin ratio (ARR) and aldosterone-Ang II ratio (AAIIR) were higher in black-HT versus white-HT ($p< 0.01$) individuals, despite a lower 24-hour urinary potassium in black-HT ($p<0.01$) with no differences noted in 24-hour urinary sodium. Ang-1-7 was detectable in a higher number of white (7) versus black (4) individuals. Ang II levels negatively correlated with systolic BP ($r=-0.4$, $p<0.01$) in black individuals only.

Conclusions:

In this UK-based study, we report higher plasma aldosterone alongside blunting of other circulating RAAS peptides, despite lower urinary potassium in the black-HT versus white-HT group. These findings point to distinctive variations in the molecular regulation of BP, RAAS and aldosterone between ethnicities. These findings possibly support the current HT guidelines which use ethnicity-based stratification.

References:

1. Faconti, Luca *et al. DOI:* 10.1097/HJH.0000000000002403
2. van Rooyen JM et al. doi: 10.1177/1470320316669880.

O-18 - Assessing Hypertension Awareness and Health Literacy in a Tertiary Hypertension Clinic Setting

Mr Ak Md Nukman Syawqi Bin Pg Md Salimin[1], Dr Stefanie Lip[2], Dr Iain Frater[2], Dr Rebecca Hanna[3], Dr Maggie Rostron[1], Dr Sarah Nichol[3], Prof Sandosh Padmanabhan[1], Dr Linsay McCallum[3,4,]
[1]University Of Glasgow, [2]BHF Glasgow Cardiovascular Research Centre, University of Glasgow, [3]NHS Greater Glasgow and Clyde, [4]Institute of Cardiovascular and Metabolic Science, University of Glasgow

Introduction:

Despite efforts to manage hypertension (HTN), including enhancing public awareness and understanding of the associated cardiovascular risks, there remains a gap in effective knowledge and behavior influencing blood pressure (BP) control.

Methods:

In the OPTIMA-BP trial (ClinicalTrials.gov: NCT05575453), patients with hypertension attending the Glasgow BP clinic monitored their BP at home for 7-days and were surveyed for health literacy and BP awareness. Descriptive analyses evaluated responses from 162 enrolled participants who completed the baseline BP/questionnaires.

Results:

Participants had an average age of 54.4±13.8 years with a balanced gender distribution (49% female, 51% male) and predominantly identified as White British (84%). The average home BP reading was 136.6/85 ± 17.2/12.3 mmHg. Participant reported health literacy (Brief Health Literacy Screen) was high, with scores between 4.5 and 4.7 on a 5-point scale for 5 questions. Awareness of BP-related facts was variable, with only 36% recognizing HTN's potential to cause dementia, 42% acknowledging it as a lifelong condition, and 44% associating it with sexual dysfunction. Awareness of HTN as a stroke and heart attack risk factor was 65%. Nutritional knowledge was also mixed; 49% recognized the high salt content in cheese, while 61% and 64% correctly identified salt content in tinned soup and bacon, respectively.

Conclusions:

Despite attendance at a specialised BP clinic, participant awareness of HTN risks and necessary lifestyle adjustments remains insufficient. There is a critical need for targeted educational programs to enhance patient knowledge and reduce cardiovascular risks.

Disclosures:

None.

References:

None.

O-19 - Review of Current Practice of Radiological Investigation of Renal Artery Stenosis

Dr Rebecca Nielsen[1], Dr. Rida Mumtaz[1], Dr. Joy Ferguson[1], Mr Charles Blake[2], Dr. Tehreem Butt[1]
[1]Mid And South Essex NHS Foundation Trust, [2]Oxera Consulting LLP

Introduction:

Renal artery stenosis (RAS) is an important differential when investigating for secondary causes of hypertension. Different imaging modalities may be considered, including Renal Duplex Ultrasound (DUS), Computed Tomography Angiography (CTA), and Magnetic resonance Angiography (MRA), but there is limited guidance on which is most appropriate. We sought to analyse renal imaging requests for RAS, with the aim of utilising data to aid clinicians in selecting the most appropriate investigation for patients dependent on individual patient characteristics.

Methods:

We performed a retrospective observational study of all renal imaging undertaken for RAS between Feb 2021 and Jun 2023. Data collected included modality requested, indications provided, patient demographics, BP at time of request, presence of cardiovascular risk factors, and reported results.

Results:

Of 640 scans, 114 were undertaken to look for RAS. Renal MRI/MRA was most frequently requested (n=75), followed by CTA (n=21). Eighteen scans (15.8%) were positive for RAS. Indications most frequently associated with RAS were 'Asymmetric Kidneys' (50%), 'Renal Failure' (21.7%) and 'Resistant/severe hypertension' (18%). Although the highest number of scans were requested for 'Young hypertension (n=37)', these yielded few positive results (2.7%). Logistic regression analysis showed that age (p=0.026), the presence of at least one cardiovascular risk factor (p=0.107), and severity of BP were most strongly predictive of RAS (p=0.097).

Conclusions:

'Young hypertension' as a sole indication for imaging, had the lowest positive yield. It could be argued therefore, that such patients would benefit from renal US/DUS as a screening modality, avoiding more costly or invasive investigations. Conversely, age, cardiovascular risk, and BP severity could be used to risk stratify patients to follow a more invasive imaging pathway (MRA or CTA). Our findings could be used to formulate a pathway to aid clinicians in selecting the most appropriate investigation for RAS based on patient characteristics.

Disclosures:

We declare there are no conflicts of interest to disclose.

References:

1. Badila E, Tintea E. How to manage renovascular hypertension. *E-Journal of Cardiology Practice European Society of Cardiology*, 2014, Vol 13 (8)
2. Aboyans V, Ricco JB, Bartelink ML et al. 2017 ESC Guidelines on the Diagnosis and Treatment of Peripheral Arterial Diseases, in collaboration with the European Society for Vascular Surgery (ESVS). *European Heart Journal*, 2018, 39, 763–821
3. Williams B, Mancia G, Spiering W et al. 2018 ESC/ESH Guidelines for the management of arterial hypertension. *European Heart Journal*, 2018, 39, 3021–3104
4. Lao D, Parasher P, Cho K, Yeghiazarians Y. Atherosclerotic Renal Artery Stenosis -Diagnosis and Treatment. *Mayo Clinic Proceedings*, 2011, 86 (7), 649-657

O-20 - A Cost-Analysis of Managing Secondary and Apparent Treatment-Resistant Hypertension in a Specialist Multidisciplinary Hypertension Clinic

Dr Louise Rabbitt[1], Dr James Curneen[1], Dr Anna Hobbins[2], Dr David Lappin[3], Prof John William McEvoy[4], Prof Paddy Gillespie[2], Prof Michael Conall Dennedy[1,] [1]Discipline of Pharmacology and Therapeutics, School of Medicine, University of Galway, [2]Health Economics & Policy Analysis Centre (HEPAC), Institute for Lifecourse & Society (ILAS), University of Galway, [3]Department of Nephrology, Saolta University Health Care Group (SUHCG), Galway University Hospitals, [4]Department of Cardiology, School of Medicine, University of Galway, Ireland

Introduction:

A knowledge gap exists around the costs and budget impact of specialist hypertension clinics. This study reports on the cost of providing care in a multidisciplinary hypertension clinic staffed by a nephrologist, endocrinologist and cardiologist which manages patients with suspected secondary hypertension and/or apparent treatment-resistant hypertension. The aim of this study is to provide the evidence required to inform policy and planning care pathways for this patient group.

Methods:

A cost-analysis from a healthcare provider perspective using micro-costing techniques was conducted to estimate the direct implementation costs of existing standard practice for the care pathway of patients attending the multidisciplinary hypertension clinic[1,2]. 65 patients originally recruited for a study of medication adherence in hypertension were included in the sample.[3]

Results:

The total care-pathway cost per patient, taking into account clinic visits, clinical reviews, investigations and MDT discussion, was estimated to be €3277, on average. For the patient subgroups, the average cost was €5644 for patients diagnosed with primary aldosteronism and €1446 for patients diagnosed with essential hypertension. A typical first visit to the clinic costs €277, while a typical return visit costs €196.

Conclusions:

There is significant cost associated with providing specialised hypertension care for patients with apparent treatment-resistant hypertension. Given the high rates of non-adherence in this population, it is likely that some of this cost could be avoided with better detection and management of medication adherence in this challenging population. Future studies should consider the cost-effectiveness of this or similar models of care by exploring the benefit to patients and the wider healthcare context of providing care of this type.

Disclosures:

This work was performed within the Irish Clinical Academic Training (ICAT) Programme, supported by the Wellcome Trust and the Health Research Board (Grant Number 203930/B/16/Z), the Health Service Executive, National Doctors Training and Planning and the Health and Social Care, Research and Development Division, Northern Ireland.

British and Irish Hypertension Society
Committed to preventing cardiovascular disease

References:

1. Frick KD. Microcosting Quantity Data Collection Methods. Med Care 2009; 47:S76–S81.
2. Charles JM, Edwards RT, Bywater T, Hutchings J. Micro-Costing in Public Health Economics: Steps Towards a Standardized Framework, Using the Incredible Years Toddler Parenting Program as a Worked Example. Prev Sci 2013; 14:377–389.
3. Curneen JMG, Rabbitt L, Browne D, O'Donoghue DF, Alansari Y, Harhen B, et al. Major disparities in patient-reported adherence compared to objective assessment of adherence using mass spectrometry: a prospective study in a tertiary-referral hypertension clinic. Br J Clin Pharmacol 2022.

O-21 - An Exploratory Study of Serum Proteomics Comparing Subjects with Treatment-Resistant Hypertension to Controlled Hypertension

Dr Mohamed Elsadig[1,2], Doctor Matej Medvecky[1], Doctor Andrew Bottrill[1], Doctor Alexander Lawson[2], Doctor Mohammed Awais Hameed[2], Professor Dimitris Grammatopoulos[1], Professor Paramjit Gill[1], Professor Indranil Dasgupta[1,2, 1]Warwick Medical School, University of Warwick, [2]University Hospitals Birmingham NHS Foundation Trust

Introduction:

The mechanism of treatment-resistant hypertension (TRH) is not fully understood. This study aimed to identify any measurable differences in protein abundance between TRH and controlled hypertension (CH) subjects using serum proteomics, which may indicate a possible mechanism.

Methods:

The study samples were obtained from an existing observational study cohort involving CH and TRH; venous blood samples were previously stored at -80°C with appropriate consent and ethical approval. TRH was defined as blood pressure (BP) of ≥140/90 mmHg on ≥3 antihypertensive agents or controlled BP (≤140/90 mmHg) taking ≥ 4 agents. CH was defined as BP ≤ 140/90 mmHg on ≤3 agents. The study was conducted in two phases: the Discovery Phase, where 60 samples of matched group's (CH n=30, TRH n=30) were depleted from the highly abundant proteins before undergoing trypsin digestion. Liquid Chromatography Mass Spectrometry analysis was used. The Validation Phase included 140 candidates (CH n=82, TRH n=58). Data were corrected for batch effect, and the results were statistically analysed using an independent T-test; P value <0.05 was considered statistically significant. Gene Ontology (GO) description was used for the functional description of the proteins.

Results:

The two groups showed a significant difference in the expression of 15 proteins: Alpha 1B glycoprotein, Alpha 1 antichromotrypsin, Leucine-rich alpha 2 glycoproteins, Inter alpha trypsin inhibitor heavy chain H3, Lumican, Complement component C9, Coagulation factor XII, Contactin-1, Lysozyme C, Fibulin, Glutathione peroxidase, Insulin-like growth factor (IGF) binding protein 3, IGF binding protein complex acid-labile subunit, Vitronectin and Vascular cell adhesion protein 1. Preliminary GO analysis suggests that the above proteins are involved in vascular integrity, endothelial function, and inflammatory response.

Conclusions:

This study showed significant differences in protein expression between TRH and CH using serum proteomics which may indicate a role for endothelial dysfunction and inflammation in the pathogenesis of TRH.

Disclosures:

No conflict of interest.

O-22 - Referrals to a Specialist Hypertension Clinic - Patient Characteristics and Implications for Service Design

Dr Abilash Sathyanarayanan[1], Dr Shivani Harikrishnan[1], Dr Jenny Clayton[1, 1]Nottingham University Hospitals NHS Trust

Introduction:

There is currently no national audit of outcomes for patients referred to a specialist hypertension service in the UK, or indeed any recent national data about the characteristics of such referrals.

Methods:

We collected data of 300 referrals to a specialist hypertension service (sampled from referrals received between March 2023 – 24).

Results:

Main findings:

a) Demography: 47% female, mean age 40.2, 40% minority ethnic background, 65.92% from Index of Multiple Deprivation quintiles 1 and 2, 17% current smokers.

b) 78% of the referrals were for patients diagnosed with hypertension below the age of 40. The mean SBP for these patients was 147.14 mmHg (SD: 15.28), which was significantly lower than the SBP of the patients >40 years of age (mean 155.36 mmHg, SD 18.47 mmHg). Most of these referrals (age <40) could be managed via a 'one stop' service model for secondary hypertension evaluation as long as anti-hypertensive medications are up titrated in primary care.

c) Other referral reasons - 17.91% suspected secondary hypertension, 17.6% resistant hypertension, 5.4% hypertension in pregnancy and postpartum, 6.1% complex polypharmacy, 1.35% postural hypotension.

d) Comorbidities: 15.5% type 2 diabetes, 10% dyslipidaemia, 4% ischaemic heart disease, 5.5% heart failure, 7.5% fatty liver, 40% mental health diagnosis

e) Only 8.5% of patients had diagnosed obstructive sleep apnoea (OSA) - undiagnosed OSA prevalence is likely to be high amongst these referred patients.

f) 39% fit NICE criteria for assessment of suitability for bariatric surgery (mean BMI 33.36, SD 8.5).

g) 7.3% had a hypertension related admission.

Conclusions:

Most of the referrals are for the workup of young onset hypertension. OSA screening and obesity assessment pathways need to have sufficient capacity to work in lockstep with the hypertension service. Information from this contemporary dataset will be useful for planning hypertension services across the UK.

Disclosures:

None.

References:

None.

PS-01 - Nationwide Trends in Blood Pressure Control Among Those with and Without Diabetes in England Over Last 2 Decades: Health Survey of England 2003-2019

Dr James Steckelmacher[1], Dr Catherine Graham[1], Dr Jai Prashar[1], Mr Maxim Capel, Dr Ayesha Ahmed[1], Dr Nicole Pereira[1], Professor Neil Poulter[2], Professor Peter Sever[2], Dr Ajay Gupta[1]
[1]Queen Mary University of London, [2]Imperial College London

Introduction:

Diabetes and hypertension are significant risk factors for cardiovascular disease (CVD) and often coexist. Efforts to improve blood pressure (BP) control, particularly among those with diabetes, have been ongoing, but their nationwide impact in England hasn't been fully documented.

Methods:

Using data from 11 nationally representative health surveys of England conducted between 2003 and 2019, we compared BP control and untreated hypertension among individuals with and without diabetes. The surveys included 94,100 individuals, and sample weights were applied to account for oversampling and nonresponse. We used 'period definitions' to define diabetes and BP control at the time of each coinciding survey, facilitating accurate comparison of trends, while accounting for changes in understanding, definitions, and medical practices. Analysis was conducted using Python, STATA, and Join Point regression software.

Results:

From 2003-2019, hypertension prevalence decreased among both those with diabetes (74.4% to 66.5%) and without diabetes (32.6% to 27.1%), corresponding to reductions in population-wide mean systolic (S) and diastolic (D) BPs. Compared to those without diabetes, those with diabetes had greater reduction in SBP (7.9mmHg vs. 4.8mmHg) and DBP (2.7mmHg vs. 1.9mmHg). Both groups showed similar improvements in BP control among those with diagnosed hypertension, with better improvement seen among those with diabetes. There was a significant difference in proportions of those with undiagnosed (unaware) hypertension amongst those with and without diabetes (11.4% vs. 30.0% respectively). Detection rates for hypertension didn't improve over time in either group.

Conclusions:

These findings indicate that BP control has improved over time, particularly among individuals with diabetes. However, improvement among those without diabetes (>90% of population) has been significantly poorer. Additionally, a considerable portion of hypertensive individuals without diabetes remain undiagnosed. Lessons from improving BP control among individuals with diabetes should be applied more broadly, and new strategies are needed to enhance detection of hypertension in the general population.

Disclosures:

None.

PS-02 - The C-Type Natriuretic Peptide Signalling Pathway Provides Cardiovascular Protection in Gestational Hypertension

Dr Giannie Barsha[1], Dr Quoc Thai Hong[1], Ms Jordyn Nelson[1], Dr Sarah Walton[1], Ms Kara Hetherington[1], Dr Jordyn Thomas[1], Professor Stephen Nicholls[1], Professor Adrian Hobbs[2], Dr Kristen Bubb[1, 1]Victorian Heart Institute and Biomedicine Discovery Institute, Monash University, [2]William Harvey Research Institute, Queen Mary University of London

Introduction:

Pre-eclampsia is a complex disorder in pregnancy, driven by maladaptation of the maternal and placental vasculature. Globally, pre-eclampsia accounts for >70,000 maternal deaths each year.1,2 There are many more women affected who are managed closely in pregnancy, often requiring early delivery of their baby.3 These women have a 4-fold increased risk of developing non-pregnancy related hypertension within a decade.4 C-type natriuretic peptide (CNP) is a potent modulator of endothelial function and angiogenesis via direct activation of its cognate natriuretic peptide receptor-C (NPRC).5 We investigated whether targeting the CNP-NPRC axis improves cardiovascular outcomes in gestational hypertension (GH).

Methods:

GH in pregnant mice (n=6-8/group) was achieved by L-NAME administration (100mg/kg/day drinking water; GD 7.5-18.5) or TNFα (500ng/kg/day s.c.; GD13.5-18.5). CNP treatment was delivered concomitantly (0.2mg/kg/day s.c.). Some L-NAME-treated mice (n=8) received cANF4-23 (NPRC agonist, 0.4mg/kg/day s.c.; GD 7.5-18.5). On GD18.5, echocardiography was performed to assess cardiac function before mice were implanted with an indwelling pressure cannula in the carotid artery to measure mean arterial pressure (MAP).

Results:

L-NAME significantly increased MAP (mmHg: control 84±2 vs L-NAME 96±2, P=0.003), but was attenuated in response to CNP or cANF4-23 treatment (mmHg: 87±2 and 90±1, respectively; both P=0.01 vs L-NAME). Acute CNP infusion (3-100μM) during MAP measurement caused a dose-dependent reduction in MAP in pregnant-control mice, that was markedly greater in L-NAME (P=0.005) but not TNFα-treated mice (P=0.8). Although no changes were detected in cardiac function, cANF4-23 treatment mitigated the L-NAME-mediated increase in LV wall thickness (control and L-NAME+cANF: 49±4% vs L-NAME: 65±4%; both P=0.04). Treatment with CNP was correlated with larger fetuses in L-NAME-treated mice (crown:rump L-NAME+CNP: 19mm vs control and L-NAME: 19mm; P=0.02).

Conclusions:

CNP-NPRC signalling improves blood pressure and foetal growth during GH, offering an exciting new therapeutic target for pre-eclampsia which in turn, may reduce lifelong cardiovascular disease burden in mothers and their babies.

Disclosures:

None.

British and Irish Hypertension Society
Committed to preventing cardiovascular disease

References:

1. Hogan MC, Foreman KJ, Naghavi M, Ahn SY, Wang M, Makela SM, Lopez AD, Lozano R, Murray CJ. Maternal mortality for 181 countries, 1980–2008: a systematic analysis of progress towards Millennium Development Goal 5. The lancet. 2010 May 8;375(9726):1609-23.
2. Rana S, Lemoine E, Granger JP, Karumanchi SA. Preeclampsia: pathophysiology, challenges, and perspectives. Circulation research. 2019 Mar 29;124(7):1094-112.
3. Beckers KF, Sones JL. Maternal microbiome and the hypertensive disorder of pregnancy, preeclampsia. American Journal of Physiology-Heart and Circulatory Physiology. 2020 Jan 1;318(1):H1-0.
4. Wu P, Haththotuwa R, Kwok CS, Babu A, Kotronias RA, Rushton C, Zaman A, Fryer AA, Kadam U, Chew-Graham CA, Mamas MA. Preeclampsia and future cardiovascular health: a systematic review and meta-analysis. Circulation: Cardiovascular Quality and Outcomes. 2017 Feb;10(2):e003497.
5. Bubb KJ, Aubdool AA, Moyes AJ, Lewis S, Drayton JP, Tang O, Mehta V, Zachary IC, Abraham DJ, Tsui J, Hobbs AJ. Endothelial C-type natriuretic peptide is a critical regulator of angiogenesis and vascular remodeling. Circulation. 2019 Mar 26;139(13):1612-28.

PS-03 - What is the Relationship Between Age and Prevalence of Posterior Cerebrovascular Variants in Hypertension?

Dr Florence Mouy[1], Dr Nathan Manghat[2], Dr Hazel Blythe[1], Dr Angus Nightingale[2], Dr Emma Hart[1]
[1]University Of Bristol, [2]University Hospitals Bristol and Weston

Introduction:

Cerebrovascular variants in the posterior cerebral circulation are associated with hypertension and lower total cerebral blood flow (tCBF) in both early-onset and midlife hypertensive patients1,2. It is currently unknown whether these variants increase in frequency with age. We aimed to assess whether there are differences in the prevalence of posterior cerebrovascular variants between patients with young-onset hypertension (YOH) vs. midlife-onset hypertension (MOH).

Methods:

We performed a retrospective analysis of magnetic resonance imaging cerebral angiograms (time-of-flight), completed as part of standard screening in a tertiary hypertension clinic. 162 young hypertensives (≤40years) and 83 middle-aged hypertensives (age>40) were eligible for inclusion. tCBF was measured via phase-contrast angiography in the internal carotid and vertebral arteries. Secondary causes of hypertension were excluded. We specifically examined the prevalence of vertebral artery hypoplasia (VAH) combined with an incomplete circle of Willis (iCOW) [VAH+iCOW] given its known association with hypertension1.

Results:

Mean age in the YOH group was 32±6.2 versus 55±11 in the MOH group ($p<0.0001$). VAH+iCOW was present in 45% (n=73) of young hypertensives and 28% (n=23) of middle-aged hypertensives ($p=0.0092$). There was no difference in tCBF in young and middle-aged hypertensives with VAH+iCOW (1.134±0.24L/min vs 1.121±0.23L/min respectively, $p=0.7954$). There was no correlation between age and tCBF in all patients with VAH+iCoW ($r=-0.097$, $p=0.3768$), but there was a negative correlation between tCBF and age in those without VAH+iCoW ($r=-0.356$, $p<0.0001$), suggesting that there is a lower tCBF in older patients without VAH+iCoW.

Conclusions:

The prevalence of posterior cerebrovascular variants was higher in the YOH cohort compared with the MOH cohort, suggesting that these variants do not develop secondary to age-related remodelling factors or duration of hypertension. There was no relationship between age and tCBF in those with both variants, whilst there was in those without these variants.

Disclosures:

None.

References:

1. Warnert EA, Rodrigues JC, Burchell AE, Neumann S, Ratcliffe LE, Manghat NE, Harris AD, Adams Z, Nightingale AK, Wise RG, Paton JF. Is high blood pressure self-protection for the brain?. Circulation research. 2016 Dec 9;119(12):e140-51.
2. Manghat NE, Robinson E, Mitrousi K, Rodrigues JC, Hinton T, Paton JF, Wise RG, Nightingale AK, Hart EC. Cerebrovascular variants and the role of the selfish brain in young-onset hypertension. Hypertension. 2022 Jun;79(6):1265-74.

PS-04 - Does Training Hours Influence the Association Between Cardiac Parameters and Systolic Blood Pressure in Young Adults and Children?

Miss Abbie Williams[1], Dr Keeron Stone[1,2,3], Dr Rachel Lord[1,4], Professor Michael Stembridge[1], Professor David Oxborough[5], Dr Dean Perkins[1], Dr Christopher Pugh[1,4], Professor Barry McDonnell[1,2,3,] [1]Cardiff Metropolitan University, [2]Centre for Cardiovascular Health and Ageing, Cardiff Metropolitan University, [3]National Cardiovascular Research Network, [4]Centre for Health, Activity and Wellbeing Research (CAWR), [5]Liverpool John Moores University.

Introduction:

Understanding the mechanisms associated with elevated systolic blood pressure (SBP) in youth is important to better understand future cardiovascular risk. A high prevalence of elevated SBP has been observed in athletic populations and people with a high cardiac output (CO). However, the relationship between high levels of training volume, CO and SBP in children and young adults remains unknown. The aim of this study is to investigate the association between training hours and CO on levels of SBP in both children and young adults.

Methods:

One thousand and nine subjects were assessed and split into a "child" cohort (N=284, 15±3 years, 21.17±3.85 kg/m², 68% male) and a "young adult" cohort (N=725, 23±4 years, 25.01±3.42 kg/m², 66% male). All subjects undertook a detailed physical activity and medical history questionnaire. Blood pressure was measured using a validated semi-automated oscillometric device and CO, left ventricular mass (LVM), left ventricular volumes and heart rate were measured using cardiac ultrasound in the supine position.

Results:

In children and young adults, training hours were significantly associated with SBP ($p<0.01$ & $p<0.05$, respectively). However, multi-linear regression analysis illustrated that training hours were not independently associated with SBP in both children and young adults when other confounding variables (age, sex, height, CO, heart rate, TPR and LVM) were entered in the model. Importantly, for both children and young adults, CO remained a significant independent predictor of SBP ($p<0.001$ for both cohorts).

Conclusions:

Whilst training hours did not remain independently associated with SBP, the influence of training load on CO may be one possible mechanism indirectly influencing levels of SBP in children and young adults. More prospective studies, measuring both cardiac and vascular properties, are required to investigate these associations further.

Disclosures:

None.

PS-05 - Home Blood Pressure Screening in May Measurement Month 2022 using the ZOE Health Study App

Ms Gabriele Kerr[1], Dr Thomas Beaney[1], Professor Markus Schlaich[2], Professor Aletta Schutte[3,4], Professor George Stergiou[5], Dr Sarah Berry[6], Professor Tim Spector[7], Professor Neil Poulter[8,]
[1]Department of Primary Care and Public Health, Imperial College London, [2]Dobney Hypertension Centre, Medical School, Royal Perth Hospital Unit - University of Western Australia, [3]School of Population Health, University of New South Wales, The George Institute for Global Health, [4]Hypertension in Africa Research Team/SAMRC Unit for Hypertension and CVD, North-West University, [5]Hypertension Center STRIDE-7, National and Kapodistrian University of Athens, School of Medicine, Third Department of Medicine, Sotiria Hospital, [6]Department of Nutritional Sciences, King's College London, [7]Department of Twin Research & Genetic Epidemiology, King's College London, [8]Imperial Clinical Trials Unit, Imperial College London

Introduction:
The global May Measurement Month (MMM) campaign aims to raise awareness of raised blood pressure (BP). In 2022, MMM incorporated home BP measurements from UK users of the ZOE Health Study app. We compare the hypertension care cascade amongst ZOE app users with other European non-ZOE MMM participants.

Methods:
Adult (≥18 years) UK ZOE app users were invited to participate in MMM in 2022. ZOE participants were advised on taking three home BP measurements and non-ZOE participants had three standardised seated BP measurements in a range of facilities outside the home. All participants completed a questionnaire. Hypertension was defined using thresholds for clinic BP (≥140/90 mmHg) for non-ZOE participants and thresholds for home BP (≥135/85 mmHg) for ZOE participants, based on the mean of the second and third measurements, and/or taking antihypertensive medication. Awareness was defined as having a previous diagnosis of hypertension or treatment with antihypertensive medication.

Results:
A total of 50,200 ZOE participants were screened in MMM22, of whom 94.0% were over 50 years of age and 65.8% were female. 24,967 (49.7%) were hypertensive, of whom 19,356 (77.5%) were aware, and 18,195 (72.9%) were taking antihypertensive medication and 11,454 (45.9%) were controlled to <135/85 mmHg. Compared to the other 64,256 MMM22 European participants, ZOE participants had slightly higher rates of hypertension (49.7% vs 48.9%), and greater proportions of ZOE hypertensive participants were aware (77.5% vs 70.8%), treated (72.9% vs 63.3%), and controlled to <135/85 in ZOE participants and <140/90 mmHg in non-ZOE participants (45.9% vs 30.9%) ($p<0.001$ for all).

Conclusions:
In this large UK sample of ZOE users with hypertension, a higher proportion were aware, treated and controlled than amongst other European MMM screenees with hypertension. These digitally-enabled ZOE users apparently have greater access or engagement with effective BP management strategies.

PS-06 - Variations in Accuracy of Validated BP Monitors: A Historical Review

Mr Muhammad Azhar[1], Dr Philip Lewis[1,2], Dr Amir Keshmiri[1], Dr Parthasarathi Mandal[1]
[1]The University of Manchester, [2]Stockport NHS Foundation Trust

Introduction:

Oscillometric blood pressure monitors (OBPMs) have largely replaced manual sphygmomanometry. OBPM variability [1] and evolving regulatory guidelines [2], mandate ongoing evaluation. We therefore assessed OBPM performance differences across various manufacturers over time.

Methods:

Validations of automatic upper arm OBPMs from 1990 to 2022 published on the BIHS and StrideBP websites were selected following PRISMA guidelines [3] which reported mean bias and standard deviation (SD) of differences between OBPMs and reference methods, following BIHS, AAMI, and ESH-IP protocols. English language studies were selected, and duplicates excluded.

Results:

241 studies (13766 subjects) met selection criteria. Mean absolute bias for systolic (SBP) and diastolic blood pressure (DBP) was 1.5 mmHg indicating low systematic bias. Range of mean bias was -6.9 to +11.0 mmHg (SBP) and -5.2 to +13.4 mmHg (DBP). Systematic bias provided no information about varying performance. Maximum SDs representing spread of errors and device performance variability, were 14.0 mmHg for SBP and DBP. From 1980 to 2010, SBP and DBP SDs were 1.5-13.8 mmHg and 1.4-14.0 mmHg respectively. From 2011 to 2022 these SDs were 0.45- 9.9 mmHg (SBP) and 1.65-11.0 mmHg (DBP). Subgroup analysis of devices by Microlife, A&D, Omron, and Dinamap indicated variability in measurement accuracy. Microlife devices overestimated SBP, and A & D underestimated DBP, contrary to general trends.

Conclusions:

This review indicates that OBPMs show low mean bias not entirely representative of accuracy. Devices over recent decades have shown marginal improvement overcoming systematic error, but BP measurement variability remains high. Variations among different manufacturers assert that OBPMs are not interchangeable, highlighting the importance of individual device validation. OBPMs overestimate diastolic readings in older adults. This study underscores the need for continuous monitoring and independent validation of these devices to ensure reliable BP measurements across different populations and device brands and models.

Disclosures:

None.

References:

1. Skirton, H., et al., *A systematic review of variability and reliability of manual and automated blood pressure readings.* Journal of clinical nursing, 2011. **20**(5-6): p. 602-614.
2. Stergiou, G.S., et al., *A universal standard for the validation of blood pressure measuring devices: Association for the Advancement of Medical Instrumentation/European Society of Hypertension/International Organization for Standardization (AAMI/ESH/ISO) Collaboration Statement.* Hypertension, 2018. **71**(3): p. 368-374.
3. Moher, D., et al., *Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement.* Annals of internal medicine, 2009. **151**(4): p. 264-269.

PS-07 - Association between Poor Sleep Quality and Increased Left Ventricular Mass in a Multi-Ethnic Cohort

Mr Eshaan Ghei[1], Professor Alun Hughes[1], Dr Victoria Garfield[1], Dr Chloe Park[1, 1]University College London

Introduction:

Poor sleep quality is associated with incident cardiovascular disease (CVD)1, 2 but mechanisms remain uncertain. We investigated the relationship between sleep quality and left ventricular (LV) structure in a UK-based tri-ethnic cohort consisting of people of European (EU), South Asian (SA) and African-Caribbean (AC) ethnicity.

Methods:

A complete case analysis of 1184 participants in the Southall and Brent Revisited (SABRE) study (age=49.9±6.2y; male 75.9%, EU=615, SA=457, AC=212). A composite sleep quality score was calculated from an adapted Jenkins Sleep Questionnaire and LV structure was measured using echocardiography. Associations between sleep quality and LV measures (LV mass indexed to height1.7 (LVMi), relative wall thickness (RWT) and LV end-diastolic volume indexed to height1.7 (LVEDVi)) were estimated by multiple linear regression with adjustment for potential confounders. Analyses were performed in the whole cohort and stratified by ethnicity.

Results:

Compared with those with best sleep quality, participants with worst sleep quality had higher LVMi (4.77(95% CI 1.38-8.17)g/m; p=0.006 after adjustment). There was no convincing evidence of an association between sleep quality and RWT or LVEDVi. After stratifying for ethnicity, the association between sleep quality and LVMi was unconvincing in EU (1.88(-3.50-7.26); p=0.493), whereas poor sleep was associated with higher LVMi in SA and AC participants (9.06(1.29-16.84)g/m; p=0.023 and 5.78(0.54-11.03)g/m; p=0.031 respectively), however there was no significant interaction by ethnicity (SA p=0.472 and AC p=0.211).

Conclusions:

Sleep quality is associated with LV remodelling in an older age tri-ethnic cohort. This could contribute to increased cardiovascular risk. Associations between sleep quality and LV remodelling may differ by ethnicity.

Disclosures:

SABRE was supported by the British Heart Foundation, Diabetes UK, Medical Research Council and the Wellcome Trust.

References:

1. Garfield V et al. Sleep Med. 2019;60:230–5.
2. Fan M et al. Eur Heart J. 2020;41:1182–9.

PS-08 - Influence of Ethnicity on the Erythrocyte Glycocalyx Sensitivity to Sodium and its Correlation with Hypertension-Mediated Organ Damage

Mr Morgan Keogh[1], Dr. Ryan McNally, Mr. Reece Travis, Mr. Aditya Sharma, Dr. Sally Brett, Professor Philip Chowienczyk, Dr. Luca Faconti, [1]King's College London

Introduction:

The erythrocyte glycocalyx sensitivity to sodium (eGCSS) is a novel test of sodium-induced damage on the erythrocyte surface which has been proposed as marker of salt sensitivity (SS) in humans. SS is an independent risk factor for cardiovascular events which is more prevalent in older individuals and in subjects of African origin background (black). Here we explore ethnic related differences in eGCSS and its correlation with the hypertension mediated organ damage (HMOD).

Methods:

Subjects with primary hypertension and self-defined ethnicity as “black” and “white” were recruited from the hypertension service at Guy’s and St Thomas’ Hospital. Biochemistry investigations (including eGCSS) and data on HMOD at renal (microalbuminuria) and vascular level (arterial stiffness measured as carotid-femoral pulse wave velocity (cf-PWV)) were collected in a single study visit.

Results:

176 subjects (52% male) of whom 46% black, age (mean±SD) 43 ± 13 years were recruited. Apart from higher BMI and cholesterol level in Black subjects compared to white individuals the two groups were similar in age, gender, blood pressure and other cardiovascular risk factors. In the entire cohort eGCSS was correlate with age (β=0.21, P=0.004) and after stratifying the population according to ethnicity eGCSS was higher in black subjects compared to white individuals (117±41% vs 104±38% respectively, P<0.05). Black subjects also showed a higher prevalence of microalbuminuria compared to white individuals (33% vs 14.5% respectively, P<0.05) and elevated cf-PWV (10.17±2.41 vs 9.25±1.94 m/s respectively, P<0.05)

Conclusions:

eGCSS is higher in black subjects compared to white individuals despite no differences in blood pressure and other traditional cardiovascular risk factors. This might help to explain the higher incidence of hypertension mediated organ damage in black subjects.

PS-09 - Applying the 2023 ESH Hypertension Guidelines to the Irish Population: Findings from the Irish Longitudinal Study on Ageing (TILDA)

Dr Caoimhe Mc Garvey[1], Dr Robert Briggs[1], Professor Cathal McCrory[1], Regius Professor Rose Anne Kenny[1], Professor Donal Sexton[1, 1]The Irish Longitudinal Study on Ageing (TILDA), Trinity College Dublin

Introduction:

Hypertension (HTN) is an important risk factor for cardiovascular disease (CVD), the leading cause of mortality worldwide 1. The aim of this study was to apply the latest European Society of Hypertension (ESH) Guidelines 2023 to the Irish general population 2.

Methods:

This study used data from Wave 1 (2009-2010) and Wave 3 (2014-2015) of the Irish Longitudinal Study on Ageing (TILDA). TILDA is a prospective cohort study based on stratified random sampling, which is representative of community living older population in Ireland (Aged 50 years and over) 3. Using this data, the prevalence of HTN in the general population by grade and stage as set out in the ESH 2023 guidelines was calculated. Population awareness of diagnosis, treatment status, control on treatment and adherence to recommended anti-hypertensive medication classes were assessed. Subgroup analyses were explored in alignment with specified groups highlighted in the Guidelines including those over 80 years old with and without frailty, those with chronic kidney disease and those with home blood pressure (BP) measurements. Inverse probability weighting was applied to account for the complex survey design used in TILDA and data analysis was conducted using Stata 15.1.

Results:

Results from Wave 3 (N=5,329): The prevalence of hypertension was 64.0% (95% confidence interval (CI) 62.4-65.6%). Of those with HTN, 55.5% (95% CI 53.3-57.7) were aware of their HTN diagnosis and 70.4% (95% CI 68.3-72.2%) were on antihypertensive treatment. Of those on treatment, 53.2% were controlled (BP < 140/90), and only 20.0% (95% CI 18.3-21.8) were on a recommended dual therapy. 55.2% were on at least one agent recommended by the ESH guidelines.

Conclusions:

This study indicates a high prevalence of HTN in the general population in Ireland aged 50+ years with low levels of awareness, control, and poor adherence to the most recent ESH HTN guidelines.

Disclosures:

The Irish Longitudinal Study on Ageing is funded by Irish Life, The Atlantic Philanthropies, and the Department of Health in Ireland. The funders played no role in study design, methods, subject recruitment, data collection or analysis. No conflicts of interest to declare.

References:

1. Wu CY, Hu HY, Chou YJ, Huang N, Chou YC, Li CP. High Blood Pressure and All-Cause and Cardiovascular Disease Mortalities in Community-Dwelling Older Adults. Medicine (Baltimore). 2015 Nov; 94(47):e2160. doi: 10.1097/MD.0000000000002160
2. Mancia, Giuseppea,∗; Kreutz, Reinholdb,∗; Brunström, Mattiasc; Burnier, Micheld; Grassi, Guidoe; Januszewicz, Andrzejf; Muiesan, Maria Lorenzag; Tsioufis, Konstantinosh; Agabiti-Rosei, Enricoi; Algharably, Engi Abd Elhadyb; Azizi, Michelj,k; Benetos, Athanasel; Borghi, Claudiom; Hitij, Jana Brguljann; Cifkova, Renatao,p; Coca, Antonioq; Cornelissen, Veroniquer; Cruickshank, J. Kennedys; Cunha, Pedro G.t,u; Danser, A.H. Janv; Pinho, Rosa Maria dew; Delles, Christianx; Dominiczak, Anna F.y; Dorobantu, Mariaz; Doumas, Michalisaa; Fernández-Alfonso, María S.bb,cc; Halimi, Jean-Micheldd,ee,ff; Járai, Zoltángg; Jelaković, Bojanhh; Jordan, Jensii,jj; Kuznetsova, Tatianakk; Laurent, Stephanell; Lovic, Draganmm; Lurbe, Emparnn,oo,pp; Mahfoud, Felixqq,rr; Manolis, Athanasiosss; Miglinas, Mariustt,uu; Narkiewicz, Krzystofvv; Niiranen, Teemuww,xx; Palatini, Paoloyy; Parati, Gianfrancozz,aaa; Pathak, Atulbbb; Persu, Alexandreccc; Polonia, Jorgeddd; Redon, Josepoo,eee,fff; Sarafidis, Pantelisggg; Schmieder, Rolandhhh; Spronck, Bartiii; Stabouli, Stellajjj; Stergiou, Georgekkk; Taddei, Stefanolll; Thomopoulos, Costasmmm; Tomaszewski, Maciejnnn,ooo; Van de Borne, Philippeppp; Wanner, Christophqqq; Weber, Thomasrrr; Williams, Bryansss; Zhang, Zhen-Yuttt; Kjeldsen, Sverre E.uuu. 2023 ESH Guidelines for the management of arterial hypertension The Task Force for the management of arterial hypertension of the European Society of Hypertension: Endorsed by the International Society of Hypertension (ISH) and the European Renal Association (ERA). Journal of Hypertension 41(12): p 1874-2071, December 2023. DOI: 10.1097/HJH.0000000000003480
3. Donoghue OA, McGarrigle CA, Foley M, Fagan A, Meaney J, Kenny RA, Cohort Profile Update: The Irish Longitudinal Study on Ageing (TILDA), International Journal of Epidemiology, Volume 47, Issue 5, October 2018, Pages 1398–1398l, https://doi.org/10.1093/ije/dyy163

PS-10 - A Comparative Analysis of Blood Pressure Control in Low-Renin Hypertension Versus Non-Low-Renin Hypertension

Mr Reece Travis[1], Dr Ryan McNally[1], Mr Morgan Keogh[1], Mr Aditya Sharma[1], Dr Sally Brett[1], Professor Phillip Chowienczyk[1], Dr Luca Faconti[1, 1]King's College London

Introduction:

A significant proportion of hypertensive patients display a low-renin phenotype and are commonly referred to as having low-renin-hypertension (LRH). LRH has been related to increased risk of cardiovascular events, but it is debated whether it is more difficult to treat than non-low-renin hypertension (NLRH). Here, we investigated the prevalence of LRH and blood pressure (BP) control in a specialist centre at 3 and 12 months.

Methods:

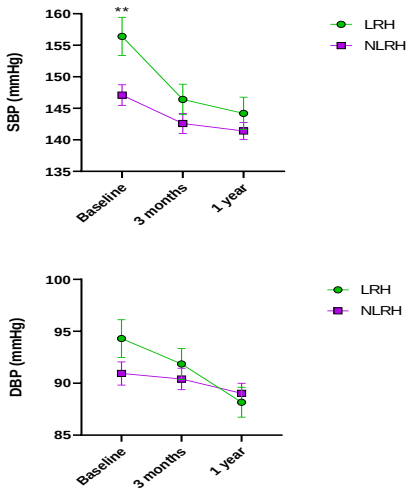
Consecutive hypertensive patients not on treatment with beta-blockers and centrally acting drugs were recruited. Anthropometric variables, biochemistry assessment and BP measurement were evaluated at baseline following which patients were classified as LRH with renin <5mU/L. Clinical data at 3 and 12 months were then used to assess BP control.

Results:

205 patients (age (mean±SD) 44±13 years, 61% male), of whom 92% were on pharmacological treatment, were recruited. LRH and NLRH were similar in age, gender, body mass index, prevalence of diabetes and dyslipidaemia. Subjects with LRH (n=59) had higher systolic BP values compared to NLRH (156±23 mmHg versus 147±20 mmHg respectively, P=0.013) with non-significant difference in diastolic BP (94±14 versus 91±14 respectively, P=0.175). Change in systolic BP values were greater in LRH versus NLRH at 3 months and 12 months (-10.8±2.9 mmHg versus -5.1±1.6 mmHg and -13.1±3.4 mmHg versus -6.3 ±1.7 mmHg respectively, P< 0.05). BP values at 12 months were similar between the two groups (144±20/88±11 mmHg versus 141±16/89±12 mmHg for LRH and NLRH respectively, P=0.375). Treatment at 12 months differed, with LRH patients more likely to be prescribed diuretics (39% versus 25%) and less likely to be prescribed ACE-i/ARB (39.0% versus 61.4%), both P<0.05.

Conclusions:

LRH is a relatively common clinical phenotype more often treated with diuretics. LRH patients achieve similar levels of BP control compared to NLRH at 3- and 12-month follow-up.



P-01 - Advanced Fibromuscular Dysplasia in Single Functional Kidney - What's the Best Timing for Auto-transplantation?

Dr Alfredo Petrosino[1], Dr Sai Krishna Duraisingham[1], Mr Prodromos Laftsidis[1], Dr Jennifer M Cross[1], Professor Stephen B Walsh[2, 1]Royal Free Hospital, [2]London Tubular Centre, UCL Department of Renal Medicine, UCL

Introduction:

A 45-year-old woman from the Middle East with known renal fibromuscular dysplasia (FMD) in single functional kidney is followed in Renovascular Clinic following a successful angioplasty a decade ago to a severely diseased long stretch renal artery FMD. She presents now with a progressively worsening blood pressure control despite optimal medical therapy including full Angiotensin Receptor Blockade and Spironolactone (50 mg), failing to achieve blood pressure target, and showing a moderate metabolic alkalosis with hypokalaemia with normal renal function. A repeated angioplasty is attempted but fails to reach the lesion.

Would renal auto-transplantation (or alternative surgical revascularisation) be indicated, and if so, what is the optimal timing to prevent the loss of a solitary kidney?

P-02 - "Difficult to Manage" Pregnant Hypertension Case

Dr Joanna Gray[1], Dr Spoorthy Burli[1], Professor Ian B. Wilkinson[1,]1Cambridge University Hospitals Nhs Foundation Trust Submission of case for BIHS 2024

Introduction:

22-year-old pregnant female presented at 23 weeks, with uncontrolled hypertension (HTN) (>150/100 mmHg) and proteinuria, requiring 3 pregnancy-safe medications at maximum doses. Biochemistry revealed secondary hyperaldosteronism (renin: 220 Um/L, aldosterone: 3150 pmol/L). The rest of the pregnancy and post-partum was uneventful, however, HTN persisted. Imaging undertaken post-partum revealed right-sided renal artery stenosis (RAS) secondary to focal renal fibromuscular dysplasia (FMD) and was treated with stenting. She had a reasonably swift response, with biochemistry normalised, requiring a single medication for HTN. 2 years later she presented with transient neurological symptoms with normal head and neck imaging.

Secondary HTN must be considered in ‘difficult to manage HTN’ in pregnancy. However, secondary screen biochemistry may be uninterpretable in pregnancy. This case highlights not only the diagnostic and therapeutic challenges of managing RAS in pregnancy, but also the need for standardised imaging of other arterial beds in FMD.

P-03 - Case Report: Novel Technologies in the Diagnosis and Management of Primary Aldosteronism: Progress and Challenges

Dr Raisa Berzina[1], Dr Sian McGarel[1,2,3], Dr James Curneen[3], Dr Louise Rabbitt[3], Dr Zainab Al Bulushi[2], Dr William John McEvoy[5], Dr Declan Sheppard[4], Dr Michael Conall Dennedy[2,3], Dr David Lappin[1,]
[1]Nephrology Department, Galway University Hospital (GUH), [2]Endocrinology Department, GUH, [3]The Discipline of Pharmacology and Therapeutics, GUH, [4]Radiology Department, GUH, [5]Cardiology Department, GUH

Introduction:

Primary aldosteronism (PA) is a common cause of secondary hypertension, characterised by excessive production of aldosterone from the adrenal glands.

This report discusses two male patients, aged 71 and 54, diagnosed with PA, presenting with initial aldosterone of 1005 and 1505pmol/L, renin of 1.8 and 4ng/ml/hr and ARR of 836 and 251 respectively. Despite optimal medical therapy, with renin de-suppression achieved in one case, both patients sought a more curative approach. They underwent [18F]CETO-PET/CT, an innovative imaging modality for localising hyper-functioning adrenal nodules. For both patients, this revealed bilateral aldosterone producing nodules. Subsequent management attempted to employ microwave ablation (MWA), an emerging technology, to target the dominant nodules, which was not without its challenges.

Despite the technical complexities involved, newer imaging modalities like [18F]CETO-PET/CT and treatment approaches such as MWA may assist in providing potential curative outcomes for patients with PA.

P-04 - Challenging NHS England's advice prohibiting the use of Doxazosin GITS in Primary Care

Dr Wayne Sunman[1], Professor Peter Sever[2], Dr Sarah Partridge[3], Professor Ian Wilkinson[4], [1]Nottingham University Hospitals NHS Trust, [2]Imperial College London, [3]Brighton and Sussex Medical School, [4]University of Cambridge

Introduction:

NHS England prohibits the routine prescription of Doxazosin GITS in Primary Care. This advice is justified on cost, selected pharmacokinetic data, and misquoted NICE guidance. First, while both doxazosin GITS and standard release preparations have a similar half-life (22 hours) and Cmin, crucially, in steady state Cmax for doxazosin standard release is nearly 3 times higher than doxazosin GITS at both 4mg and 8mg. Second, the bioavailability of doxazosin GITS is ~54% giving a smoother 24-hour profile [Chung M. J Clin Pharmacol. 1999:48(5):678-87]. Third, NICE guideline [NG136] does not make any comment about specific drug formulations. Finally, NHS England's advice to switch patients directly from modified to standard release at the same dose is unsafe. Careful titration is required to prevent precipitous blood pressure falls and risk of ischaemic stroke. We propose that NHS England revisits this advice and recommends Doxazosin GITS as a 4th line antihypertensive agent.

P-05 - A Case of Paraneoplastic Renovascular Hypertension

Dr Carmela Maniero[1], Dr Rebecca Auer[1], Dr Charlotte Manisty[1], Professor Amir Awwad[1,2,3, 1]Barts NHS Trust, [2]Royal Papworth Hospital NHS Foundation Trust, Department of Radiology, [3]Institute of Cardiovascular Science, University College London

Introduction:

A 35 years old man was admitted with chest pain and fevers. He was diagnosed nine years earlier with NH Lymphoma, for expectant management. He had developed paraneoplastic arthritis. He was symptomatic with post prandial abdominal pain and weight loss. On admission he was found to have a significant BP difference between arms and on ECHO to have severe aortic regurgitation. A CT Angio aorta found several vascular occlusions (SCAs, both renal arteries and SMA). There was no vascular metabolic activity on PET CT scan. He was started on antihypertensive medications, including a small dose of ARB without significant decline in eGFR. In June 2023 he was diagnosed with transformed lymphoma-high grade NHL and started on chemotherapy. Due to progression of disease he was offered further PET CT and biopsies which he declined as he opted for symptoms control.

P-06 - The Acute and Chronic Management Dilemmas in Hypertension Secondary to Takayasu's Arteritis

Dr James Steckelmacher[1], Dr Carmen Maniero[1], Dr Gurvinder Rull[1], Dr ManHo Kwok[1], Dr Kate Von Klemperer[1], Dr Omaima Glesa[1], Dr Rehan Khan[1], Dr Kate Wiles[1], Professor Amir Awwad[1, 1]Barts Health NHS Trust

Introduction:

We present two cases of Takayasu's Arteritis in women, both diagnosed at a young age, with unique challenges in acute and chronic management later in life. A 32-year-old woman with severe uncontrolled hypertension who was supported through a high risk pregnancy and delivery by a multi-disciplinary team. At booking her BP was 216/74mmHg on 4 different agents. She had a planned admission for delivery at 28 weeks and was admitted to critical care for BP optimisation before she underwent a successful caesarean delivery under general anaesthesia at 28+3 weeks. A 50-year-old woman with isolated systolic hypertension and relative diastolic hypotension has presented challenges in chronic BP management including that of hypoperfusion in the context of other sequelae, specifically ischaemic heart disease and peripheral vascular disease. We suggest this is caused by post-inflammatory large vessel (aorta) arterial stiffness, luminal irregularities and stenoses and will provide annotated anatomical images to illustrate this.

P-07 - Nationwide Trends in Major Cardiovascular Risk Factors in England Over Last 2 Decades: Health Survey of England 2003-2019

Dr James Steckelmacher[1], Dr Catherine Graham[1], Dr Jai Prashar[1], Mr. Maxim Capel, Dr Ayesha Ahmed[1], Dr Ajay Gupta[1] [1]Queen Mary University of London

Introduction:

Hypertension, diabetes, and obesity are major contributors to cardiovascular disease (CVD), a significant public health concern. Understanding trends in these risk factors is crucial, especially given that ischaemic heart disease ranks as the second leading cause of death in England as of 2021.

Methods:

This study investigated national trends in blood pressure (BP), diabetes, and body mass index (BMI) by analysing 11 nationally representative cross-sectional surveys from 2003-2019, comprising 94,100 adults. Sample weights were applied to account for oversampling and nonresponse. 'Period definitions' of diabetes used a glycated haemoglobin equivalent of 7% pre-2011, and the current 6.5% diagnostic threshold thereafter, facilitating accurate comparison of diabetes prevalence trends accounting for changes in definitions and practices. Total hypertension was defined as doctor diagnosed hypertension (including taking antihypertensive medications), or blood pressure ≥140/90mmHg. Analysis was conducted using Python, STATA, and JoinPoint regression software.

Results:

In England, from 2003-2019, mean BMI remained within the obesity category, rising by 0.8kg/m2, with obesity prevalence increasing from 22.6% to 28.0%. Concurrently, mean glycated haemoglobin levels rose from 6.18% to 6.54%, surpassing current diagnostic thresholds. Diabetes period prevalence surged from 4.2% to 11.6%, a trend consistent when the current diagnostic threshold was applied. However, doctor-diagnosed and total hypertension prevalence exhibited slight decreases (1.4% and 3% respectively), mirrored by reductions in mean systolic and diastolic BP (4.6mmHg and 1.9mmHg respectively).

Conclusions:

These results suggest that in 2019, among the total population of 56.3 million in England, an estimated 15.8 million adults were obese, 6.5 million had diabetes, and 17.6 million had hypertension. The obesity epidemic is likely fueling the rising diabetes prevalence. Prioritising obesity reduction in public health initiatives may help mitigate the burden of diabetes and hypertension, which currently affect almost one third of the population. Further research should explore CVD outcomes and mortality among individuals with obesity and undiagnosed hypertension.

Disclosures:

None.

References:

1. Office for National Statistics. (2022). Deaths registrations summary tables: England and Wales, 2022. Retrieved from https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deathsregistrationsummarytables/2022#:~:text=Dementia%20and%20Alzheimers%20disease%20was,for%2010.3%25%20(59%2C356%20deaths)

P-08 - Epigenetic Effects of MTHFR 677 Genotype and Riboflavin Supplementation in Hypertension Using Isogenic Induced Pluripotent Stem Cells (Epihyper)

Miss Lauren Crawford[2, 3,] Dr Meimei Yang[1], Dr Cynthia Stafford[2,3], Prof. Mary Murphy[1], Prof. Mary Ward[3], Prof. Diane Lees-Murdock[2, 1] Regenerative Medicine Institute, School of Medicine, University of Galway, [2]Genomic Medicine Research Group, School of Biomedical Sciences, Ulster University, [3]Nutrition Innovation Centre for Food and Health (NICHE), School of Biomedical Sciences, Ulster University

Introduction:

Genetic variants and environmental factors contribute to blood pressure variability. MTHFR, a key enzyme in one-carbon metabolism, is essential for generating S-adenosyl methionine (SAM), the universal donor for methylation reactions. A single nucleotide polymorphism, (MTHFR C677T), in the gene encoding MTHFR results in reduced enzyme activity and has been associated with blood pressure variation in genome-wide association studies. Homozygosity for this polymorphism (MTHFR 677TT), is associated with higher risk of hypertension and stroke. Supplementation with riboflavin, the MTHFR co-factor, results in lower blood pressure in individuals with the TT genotype. To further investigate the mechanism underpinning this gene-nutrient interaction in blood pressure, we generated induced pluripotent stem cells (iPSCs) from individuals heterozygous for MTHFR to create isogenic lines (CC/TT) using gene editing and examine phenotypic and epigenetic effects of riboflavin supplementation on vascular smooth muscle cell (VSMC) differentiation.

Methods:

Fibroblasts from two MTHFR 677CT donors have been reprogrammed into iPSCs using a non-integrating Sendai virus. Pluripotency and optimisation of VSMC differentiation were verified using qRT-PCR, immunostaining and flow cytometry. CRISPR-Cas9 will target one allele to produce homozygous iPSCs.

Results:

Morphology of three iPSC lines from each donor resembled that of human embryonic stem cells. OCT4, SOX2 and NANOG in generated iPSC were highly expressed at mRNA and protein levels. Following optimisation of differentiation, significant expression of mesoderm, early and mature VSMC markers was confirmed by immunocytochemistry, qRT-PCR and flow cytometry. Functionality of iPSC-derived VSMCs was confirmed by a contractile assay.

Conclusions:

Six iPSC lines were successfully derived from two MTHFR 677 heterozygous carriers and fully characterised. The differentiation protocol for iPSC-derived VSMCs was also successfully established. Current gene editing to generate isogenic lines will elucidate the biological significance of this MTHFR SNP in hypertension pharmacogenomics to advance patient care and provide a valuable resource for future initiatives.

References:

1. Amenyah, S. D., et al., (2021) International Journal of Cardiology., 322, 233–239.
2. Amenyah, S. D., et al., (2020) Biochimie., 173, 17–26.
3. D'Anniello et al., (2019) Epigenomes 3,3.
4. Ward et al., (2020) BMC Medicine, 18(1).

P-09 - Targeting A Hyperadrenergic State with Clonidine to Alleviate Symptoms of Depression and Impaired Stress-Modulated Vasomotor Responses: A Pilot Study in Hypertension

Ms Bushra Farukh[1], Dr Luca Faconti[1], Dr Ryan J McNally[1], Professor Phil J Chowienczyk[1,] [1]King's College London

Introduction:

Hypertension and depression are amongst the most common chronic physical and mental conditions worldwide. We previously demonstrated that hyperadrenergic state in hypertension is associated with affective disturbance and impaired stress modulated vasomotor responses. Here we examined whether clonidine, a central noradrenergic a2 agonist, can modulate these stress-sensitive comorbidities and vasomotor responses.

Methods:

Resistant hypertensive subjects with no previous history of diabetes or cardiovascular disease were recruited from the hypertension outpatient service at St. Thomas' Hospital, London. Detailed medical history and baseline characteristics including blood pressure (BP), heart rate, and plasma concentrations of normetadrenaline, as a marker of resting sympathetic activity, were obtained in the baseline study visit. Depression symptom severity was assessed using the Inventory of Depressive Symptomatology (IDS-SR30). The forearm blood flow (FBF) response to mental stress elicited by the Stroop word-colour test and that to device-guided slow breathing (DGB) with breathing rate <10 breaths/min was measured. All procedures were then repeated after seven days application of clonidine 100µg transdermal patch.

Results:

8 subjects (50% male) with (mean±SEM) age of 49.2±5.6 years and baseline BP of 165/100±5/3 mmHg were recruited. Mean plasma normetadrenaline levels and depression scores were reduced post-clonidine administration (1347±276 to 713±107 pmol/L and 28.1±6.1 to 17.5±3.4 respectively, both $P<0.05$). Comparing baseline values to post-clonidine administration, changes in BP and heart rate elicited by mental stress and DGB were similar. However, the FBF response to mental stress improved after clonidine (66±18 vs. 115±19% increase above baseline, $P<0.05$) and the response to DGB also differed in subjects post-clonidine administration ($P<0.05$).

Conclusions:

Targeting the underlying hyperadrenergic disturbance of the hypertension/affective disorders phenotype may be particularly effective for their primary indication as well as treating the associated comorbidity and can enhance stress-modulated vasomotor responses. Further studies are warranted to elucidate the clinical implication of this observation.

P-11 - Development of a Closed-Loop Antihypertensive Drug-Delivery System: Early Results from the CLADDAGH Study

Dr James Curneen[1], Dr Joanne O'Dwyer, Dr Conor Judge, Dr Delyth Graham, Professor Sally-Ann Cryan, Professor Garry Duffy, [1]University of Galway

Introduction:

Hypertension remains a leading cause of cardiovascular morbidity and mortality globally, with blood pressure (BP) variability emerging as a contributor to cardiovascular risk.(1,2) The CLADDAGH (Closed-Loop Antihypertensive Drug-Delivery Algorithm in Hypertension) project aims to develop and test an implantable closed-loop antihypertensive drug-delivery system to manage hypertension and reduce BP variability, serving as a proof of concept for precision medicine in BP management.

Methods:

A two-phase experimental approach will be performed using stroke-prone spontaneously hypertensive rats. Phase 1 involves administering incremental doses of Esmolol hydrochloride via a subcutaneous pump, following a fixed oral dose of Amlodipine, to establish dose-response curves. Phase 2 will utilise proportional integral derivative (PID) algorithms derived from Phase 1 data to control the timing and dose of Esmolol release, optimising BP control and minimising variability (coefficient of variation), dependent on real-time BP and HR data.

Results:

Early results will facilitate development of PID algorithms that adjust Esmolol dosages based on real-time monitoring of BP and HR. These algorithms will initially be validated on an already existing BP dataset. The closed-loop system will be composed of: i) radiotelemetry measurement of BP and HR, that will communicate wirelessly with ii) a controller that contains the sets of algorithms, that will determine the timing and release of Esmolol via the iii) implantable, subcutaneous pump. A custom application will allow for review of live BP, HR and coefficient of variation values during the closed-loop system administration to monitor system responsiveness. Phase 2 of the study will test the closed-loop system in a stroke-prone spontaneously hypertensive rat model.

Conclusions:

The initial stages of the CLADDAGH project are focused on establishing a robust foundation for a closed-loop antihypertensive drug delivery system. Preliminary findings on algorithm development and real-time analysis of cardiovascular data will be presented, anticipating a proof-of-concept for managing hypertension and BP variability.

Disclosures:

None.

References:

1. Parati G, Ochoa JE, Lombardi C, Bilo G. Assessment and management of blood-pressure variability. Nat Rev Cardiol [Internet]. 2013;10(3):143–55. Available from: https://doi.org/10.1038/nrcardio.2013.1
2. Mills KT, Stefanescu A, He J. The global epidemiology of hypertension. Nat Rev Nephrol [Internet]. 2020;16(4):223–37. Available from: https://doi.org/10.1038/s41581-019-0244-2

P-13 - The Hypertriglyceridemic Waist Phenotype Is Indicative of Increased Cardiovascular Risk in A Cohort of Nigerian Patients

Dr Ugochi Okorafor[1], Pharmacist Chiamaka Okorafor[2], Dr Nnanna Achime[1], Dr Onyinyechi Okam[1], Dr Casmir Amadi[1,3, 1]Meridian Cardiac Center, [2]Festac Primary Health Center, Amuwo-Odofin Local Government, [3]Department of Medicine, College of Medicine, University of Lagos, and Lagos University Teaching Hospital

Introduction:

Studies surrounding the prevalence of the hypertriglyceridemic waist (HTGW) phenotype and its relationship with established markers of cardiovascular risk especially in the Nigerian population remain sparse. This study aimed to explore the relationship between HTWG phenotype and cardiovascular risk markers namely Castelli Risk Index I and II (CRI-I and CRI-II), Atherogenic Index of Plasma (AIP) and serum triglyceride-HDL cholesterol ratio (TG/HDL).

Methods:

We retrospectively analysed the records of 206 patients of both sexes with complete data presenting at a cardiac hospital over a period of 1 year. The HTGW phenotype was deemed present with waist circumference of at least 94cm in men or 80cm in women and serum triglyceride level of 150mg/dl or more in both sexes [1].

Results:

The mean age of the population under study was 53.33±14.72 years (53.4% male, 45.6% between 45 and 64 years of age). At-risk waist circumference was more prevalent in women (92.7% vs 77.3%; p=0.002). The prevalence of the HTWG phenotype in the patient cohort was 29.6%, with more males than females (31.8% vs 27.1%) presenting with the phenotype (p=0.004). Patients with the phenotype also had higher systolic blood pressure, waist circumference, body mass index, triglycerides, AIP and TG/HDL (all p<0.0005). The HTWG phenotype was also associated with a lower HDL and LDL cholesterol (p<0.0005) as well as a lower CRI-II (p=0.049).

Conclusions:

The HTWG phenotype is conclusively associated with an increased cardiovascular risk among Nigerians. This warrants the implementation of routine anthropometric and serum triglyceride measurements in asymptomatic individuals for early detection of at-risk individuals.

Disclosures:

Not applicable.

References:

1. Alberti KG, Zimmet P, Shaw J. Metabolic syndrome—a new world-wide definition. A consensus statement from the international diabetes federation. Diabetic medicine. 2006 May;23(5):469-80.

P-14 - Clinical and Imaging Phenotype of Individuals with Suspected Primary Hyperaldosteronism: Does Ethnicity Matter?

Mr Aditya Sharma[1], Dr Ryan McNally[1], Mr Reece Travis[1], Mr Morgan Keogh[1], Dr Sally Brett[1], Professor Philip Chowienczyk[1], Dr Luca Faconti[1, 1]King's College London

Introduction:

Primary hyperaldosteronism (PA) is one the most common form of secondary hypertension in adults. However, it is debated if PA is more common in African origin individuals (black) compared to white individuals and if the morphological adrenals findings differ. Here, we studied a dual ethnic cohort of hypertensive subjects with suspected PA to determine their clinical characteristics and adrenal abnormalities.

Methods:

Individuals with hypertension were recruited from the Hypertension Clinic at Guy's and St Thomas' Hospital. Individuals with an aldosterone/renin ratio (ARR) ≥90 and/or clinical suspicion for PA underwent adrenal imaging and were included in the analysis. Moreover, we compared the effects of medical management vs adrenalectomy in controlling blood pressure (BP) values at one year follow up.

Results:

Of 664 subjects (45.5% black) consented, 137 individuals of whom 76.6% black were included in the analysis. In this cohort, 121 individuals presented with an elevated ARR and 16 cases with clinical suspicion of PA. Apart from higher systolic BP values in black individuals compared to white subjects (155±19 mmHg vs 147±21 mmHg, P=0.028), the two groups were similar in terms of age, BMI, gender, potassium level, and cardiovascular risk factors. Adrenal imaging (121=MRI, 16=CT) showed unilateral adenomas were more common in white individuals compared to black individuals (31% vs 20% respectively), whilst hyperplasia was less common (9% vs 19% respectively). 8 individuals underwent an adrenalectomy, the remaining were treated medically. BP control at one year was similar between the two groups.

Conclusions:

In secondary care, a relatively high proportion of individuals particularly from African origin background require investigations for the exclusion of PA. Adrenal findings appear also to differ among the two ethnic groups. Whether ethnic related differences exist, or the findings are the result of selection bias, warrants further studies.

Disclosures:

No conflict of interests.

P-15 - Psychological and Demographic Predictors of Adherence to Antihypertensives and Statins: A Survey Study in Primary Care

Minna Chang[1], Dr David Wingfield[1, 2], Dr Gaby Judah[1], Dr Simon Dryden[1], Qianhui Sun, Dr Judith Mackay[1], Professor Peter Sever[1, 1]Imperial College London, [2]Hammersmith and Fulham Partnership

Introduction:

Poor adherence to statins and antihypertensives is common, and associated with greater risk of a cardiovascular event, and increased mortality. To inform effective intervention design, this study aimed to understand barriers and facilitators to adherence to antihypertensives and statins, using behavioural science frameworks.

Methods:

Participants across five GP practices in London completed a survey either about taking antihypertensives or statins. This included a validated 3-item scale self-reporting adherence in the past week [1], demographic variables and 18 variables about different adherence barriers/facilitators based on the Theoretical Domains Framework, a comprehensive framework of behavioural predictors [2]. A subset of participants provided urine samples to test for drug metabolites. Participants were categorised as "fully-adherent" or "not-fully-adherent" separately for the urine/self-reported adherence. Backwards stepwise logistic regression assessed predictors of self-reported adherence.

Results:

For the anti-hypertensives sample, 80.1% were classified as fully-adherent for self-reported (N=236), and 89.0% from the urine test (N=145). Significant predictors of self-reported non-adherence in the final model were lower age (b=0.043, p=0.019), lower intentions for taking medication (b=0.761, p=0.043), forgetting to take medication (b=-0.368, p=0.048), and environmental context and resources barriers (e.g. running out of medication, difficulties arranging repeat prescriptions) (b=-0.631, p=0.003). For the statins, 73.4% were classified as fully-adherent from self-reported adherence (n=233), and 81.6% from the urine test (N=123). Significant predictors of non-adherence were having been prescribed statins for 6 years or more (b=0.809, p=0.036), lower intentions (b=-0.859, p=0.004), forgetting to take medication (b=0.704, p<.001), experiencing side-effects (b=0.414, p=0.004), and being optimistic about their future health (b=0.427, p=0.022).

Conclusions:

The study identified common determinants of intention and memory for adherence to anti-hypertensives and statins. However, different additional predictors related to intentional and unintentional non-adherence were found for the different medications. These different specific influences should be addressed when designing interventions to promote adherence.

Disclosures:

N/A

References:

1. Voils, C.I., Maciejewski, M.L., Hoyle, R.H., Reeve, B.B., Gallagher, P., Bryson, C.L. and Yancy Jr, W.S., 2012. Initial validation of a self-report measure of the extent of and reasons for medication nonadherence. Medical care, 50(12), p.1013.
2. Cane, J., O'Connor, D. and Michie, S., 2012. Validation of the theoretical domains framework for use in behaviour change and implementation research. Implementation science, 7(1), pp.1-17.

P-16 - Share The Pressure: Raising Awareness of The Disproportionate Burden of High Blood Pressure in People of Black African and Caribbean Origin

Ms Michaela Nuttall[1], Dr Mark Cobain[2], Dr Holly Whelan[2], Mr Jabeer Butt[3], Ms Tracey Bignall[3], Mr Phil Pyatt[4], [1]Smart Health Solutions, [2]Younger Lives, [3]Race Equality Foundation, [4]Blood Pressure UK

Introduction:

Share the Pressure is an initiative that aims to raise awareness and promote increased detection and diagnosis of hypertension and shared decision making in Black African and Caribbean populations.

Methods:

Using research evidence and co-design the existing Heart Age tool was adapted to make it more appropriate for the target group in terms of language, culture and health literacy needs. Secondly, a blended training model was developed to improve the skills and knowledge of HCPs about high blood pressure and in using the Heart Age tool with patients.

Results:

A total of 634 healthcare practitioners participated in the online training. These included nurses, doctors, pharmacists, allied health professionals and healthcare assistants. 46% (92) of the 202 who recorded their profession on registration were nurses. 75% of participants reported an increase in their knowledge and confidence in hypertension, shared decision making and ethnic minority differences in management. All attendees who submitted feedback reported an increase in knowledge and confidence in communication following their learning with 100% positive of the likelihood of using that learning in the future. Evaluation data shows 249 people undertook the Heart Age test. A high proportion of those with high blood pressure were motivated to lose weight, eat healthy, stop smoking and exercise than take medication. Importantly, there was motivation to speak to a healthcare practitioner as a result of the heart age test.

Conclusions:

The Share the Pressure training programme has achieved its aim of improving the skills and knowledge of healthcare professionals and raising awareness of the disproportionate burden of raised blood pressure in Black African and Caribbean populations. Despite the small sample size, the analysis of Heart Age use indicates communities' intention to action to address high blood pressure.

Disclosures:

None.

References:

None.

P-17 - Haemodynamic Changes from Pre-Pregnancy to Very Early Pregnancy Among Women Planning to Conceive in Southwestern Uganda

Dr Henry Mark Lugobe[1,2], Dr Collins David Agaba[3], Dr Carmel Mceniery[1], Prof Ian Wilkinson[1,]
[1]Department of Medicine, Division of Experimental Medicine and Immunotherapeutics, University of Cambridge, [2]Department of Obstetrics and Gynecology, Mbarara University of Science and Technology, [3]Department of Physiology, Mbarara University of Science and Technology

Introduction:

Normal pregnancy is associated with cardiovascular changes to enable the mother adapt to the pregnancy state. We sought to describe the haemodynamic changes from pre-pregnancy to very early pregnancy among women planning to conceive in southwestern Uganda.

Methods:

In this prospective cohort study, we enrolled women in southwestern Uganda who were planning to conceive. The participants' blood pressure, heart rate, cardiac output, stroke volume, total peripheral resistance and full blood count were measured at enrolment and repeated in very early pregnancy. Student's t test was used to compare the means between the two groups.

Results:

We studied 62 women from pre-pregnancy to very early pregnancy with mean age 28 years (SD±4.5). The median gestational age was 7 weeks (IQR 6,9). The brachial systolic and diastolic blood pressure decreased in very early pregnancy (116±10 to 112±9 mmHg & 76± 8 to 70±6 mmHg respectively, $p<0.001$). Central systolic and diastolic blood pressure also decreased in very early pregnancy (111±10 to 108±8 mmHg $p=0.034$ & 68 ± 6 to 64 ± 5 mmHg $p<0.001$). The heart rate increased from 78±10 to 82 ± 9 bpm $p=0.007$ in very early pregnancy. There was no significant difference in cardiac output (5.1±1.2 vs 5.3±1.0 L/min $p=0.46$), stroke volume (62±14 to 64±10 ml $p=0.176$) and total peripheral resistance (1498±664 to 1358±286 dynes/s/cm5 $p=0.121$). Haemoglobin and haematocrit all decreased (13.0±1.9 to 12.1±1.9 g/dl & 40.6±4.7 to 37.6±4.6 %, respectively $p<0.001$).

Conclusions:

Significant haemodynamic changes occur in very early pregnancy. During clinical care, using late first trimester measurements may not be the best measure to understand haemodynamic changes happening during pregnancy.

Disclosures:

No conflict of interest.

References:

N/A

P-18 - External Validation of An Algorithm to Estimate Arm Blood Pressure from Ankle Blood Pressure Measurements in A Multi-Ethnic Cohort

Ms Brianna Edmunds[1], Dr Fiona Warren[1], Dr Sinead McDonagh[1], Dr Felicia Huang[2], **Dr Christopher Clark**[1, 1]Department of Health and Community Sciences, University of Exeter Medical School, [2]Institute of Cardiovascular Science, University College London

Introduction:

When brachial blood pressure (BP) measurement is not possible, due for example to phocomelia or amputation, leg measurement is an alternative but interpretation is difficult. The ABLE-BP (Arm Based on Leg BP) study developed and validated a multivariable model estimating individual systolic arm BP from ankle BP in over 33,000 participants.1 Ethnicity in the model reflected United States (US) classifications of White, African-American, Hispanic-American or other. This study externally validated performance of the ABLE-BP algorithm in a multi-ethnic United Kingdom (UK) cohort.

Methods:

The Southall And Brent REvisited (SABRE) study enrolled people of African-Caribbean, South Asian or European ethnicity aged 40 to 69 from Southall or Brent (London, UK).2 Three logical ethnicity maps were created: P1 grouped all SABRE participants as White; P2: European as White, South Asian and African-Caribbean as other; P3: European and South Asian as White, African-Caribbean as African-American. The ABLE-BP algorithm was applied to each model; areas under receiver-operation characteristics curves (AUC) were used to compare predicted and actual systolic arm BPs at 140mmHg and 160mmHg thresholds.

Results:

Complete data were available for 707 participants. Overall, models P1, P2 and P3 all performed well; AUC values exceeded 0.840 for all ethnicities in all models. No differences between models were observed at the 140mmHg threshold. At 160mmHg there were no differences for European or South Asian ethnicities between models. However, for African-Caribbean participants P1 performed better than P3 (AUC 0.885 vs 0.881; p=0.030; Bonferroni corrected p=0.060).

Conclusions:

The ABLE-BP algorithm performed well in estimating arm BP from ankle BP measurements in this population. UK ethnic categories mapped well to existing classifications with weak evidence to suggest that UK African-Caribbean ethnicity was best modelled using White rather than African-American ethnicity. The findings support expansion of the ABLE-BP algorithm to include ethnic categories commonly encountered in the UK.

Disclosures:

CEC was supported by a National Institute for Health and Care Research (NIHR) School for Primary Care Research (SPCR) grant (no 512). SM was supported by a NIHR SPCR Postdoctoral Fellowship. SABRE was supported at baseline by the Medical Research Council, Diabetes UK (DUK) and the British Heart Foundation (BHF). At follow up the study was funded by the Wellcome Trust [grant numbers 067100,37055891 and 086676/7/08/Z], the BHF [grant numbers PG/06/145,PG/08/103/26133, PG/12/ 29/29497and CS/13/1/30327] and DUK [grant number13/ 0004774]. The study team also acknowledges the support of the NIHR Clinical Research Network.

References:

1. McDonagh STJ, Warren FC, Sheppard JP et al. Arm Based on LEg blood pressures (ABLE-BP): Can systolic ankle blood pressure measurements predict systolic arm blood pressure? An individual participant data meta-analysis from the INTERPRESS-IPD Collaboration (in submission)
2. Tillin T, Forouhi NG, McKeigue PM et al. Southall And Brent REvisited: Cohort profile of SABRE, a UK population-based comparison of cardiovascular disease and diabetes in people of European, Indian Asian and African Caribbean origins. *Int J Epidemiol*. 2012; 41(1):33–42

P-19 - Higher Skeletal Muscle Mass is Associated with Higher Blood Pressure

Dr Eduard Shantsila[1], Dr Alena Shantsila[1], Professor Yalin Zheng[1], Professor Gregory YP Lip[1]
[1]University Of Liverpool

Introduction:

Adequate physical exercise is recommended to improve blood pressure (BP) and reduce cardiovascular risk. Skeletal muscle mass (SMM) reflects genetic factors, body weight, and some types of exercise and is increasingly seen as a surrogate target for exercise monitoring. Data on how changes in SMM influence BP are scarce, and the aim of this analysis was to explore this in a large population-based cohort study.

Methods:

The study analysed UK Biobank data (baseline n= 458,946, age range 40-73 years, median age 58, 53% women, 95% white, 28% [n= 127,716] had hypertension). SMM index (SMMI, kg/m2) and total body fat mass index (FMI, kg/m2) were calculated using Tanita BC418MA body composition analyser (USA) at baseline with measurements repeated (n=18,024) after a median follow-up of 4.4 [3.7-4.9] years. BP (mmHg) was measured during the same visits. Multivariable linear regression was used to test the association of SMMI with BP, adjusted for age, sex, diabetes, FMI, and BP-lowering drug use. Continuous data are presented as median [interquartile range] and compared using Wilcoxon text. R software was used for analyses.

Results:

At baseline, SMMI was higher in people with hypertension (18.4 [16.4-20.2] vs. non-hypertension group, 17.3 [15.5-19.3]; p<0.001). Higher baseline SMMI was independently associated with higher SBP (regression coefficient [B]±standard error[SE] 0.70±0.02, p<0.001) and DPB (B±SE 0.28±0.01, p<0.001). During follow-up, the overall SMMI reduced by 0.01 (-0.06 – 0.29), FMI increased by 0.28 [-0.43 - 0.95], SBP increased by 1.5 (-7.5 – 10.5), DBP reduced by -1.5 (-6.5 – 4.0). An increase in SMMI during follow-up was independently associated with increase in systolic BP (B±SE 1.51±0.15, p<0.001) and diastolic BP (B±SE 0.56±0.08, p<0.001).

Conclusions:

High rather than low SMMI was associated with increased BP values in a large prospective dataset. Further analyses are needed to understand the involved mechanisms and optimal SMMI targets.

Disclosures:

None.

P-20 - Prospective Evaluation of Demographics, Clinical and Biochemistry Findings in Obese and Non-Obese Young Onset-Hypertensive Individuals

Dr Joanna Gray[1], Dr Oseremen Oriaifo[1], Mr Martin Tan[1], Ms Anjelica Akrami[1], Dr Spoorthy Burli[1]
[1]Cambridge University Hospitals Nhs Foundation Trust

Introduction:

Obesity is a well-known risk factor for hypertension; however, the underlying pathological mechanisms are complex. Sympathetic nervous stimulation and activation of renin angiotensin aldosterone syndrome are some of the mechanisms implicated in development of hypertension in obese individuals. In this report, we compare demographic, clinical and biochemistry findings in obese (body mass index (BMI)> 30 kg/m2) and non-obese individuals in a cohort of patients with young onset hypertension (< 40 years of age).

Methods:

We conducted analysis of 49 patients referred to a specialist hypertension clinic as part of prospective service evaluation. The mean age of onset of hypertension was 29 years (range 10 to 40 years). Twenty four subjects were non-obese (BMI <30) and twenty five were obese (BMI≥30). Age, BP, HR, creatinine and electrolytes, 24-hour urine electrolytes, renin and aldosterone was compared in the two cohorts.

Results:

There was no difference between the average BP between the two groups at the point of their referral to our service: 147/96 mmHg vs 146/94mmHg, however, 64% (n=16) of referred patients with BMI ≥30 was already on antihypertensive treatment, compared to 41% patients in a none-obese group (n=10). Obese patients were found to have lower renin-aldosterone ratio (RAA) than non-obese: 19 vs 27, respectively, but equal 24-hr urinary sodium excretion, pulse pressure, HR and creatinine.

Conclusions:

The effect of obesity on the RAA system varies and is likely not generalizable. We found that lower RAA values in obese population did not correlate with increased 24-hr urinary sodium excretion, which could be used as an indirect indicator of daily salt consumption. Obesity is also postulated to activate SNS but we found no difference in HR and pulse pressure in these two groups. More patients will be included in our analysis as we experience increasing referral rate for young-onset hypertensives.

Disclosures:

None.

References:

1. Tirosh, A., Hannah-Shmouni, F., Lyssikatos, C., Belyavskaya, E., Zilbermint, M., Abraham, S. B., Lodish, M. B., & Stratakis, C. A. (2017). Obesity and the diagnostic accuracy for primary aldosteronism. *Journal of clinical hypertension (Greenwich, Conn.)*, *19*(8), 790–797. https://doi.org/10.1111/jch.13041
2. Yoshida, Y., Shibata, H. Fat mass: the most sensitive predictor of persistent hypertension in unilateral primary aldosteronism. *Hypertens Res* **46**, 1444–1446 (2023). https://doi.org/10.1038/s41440-023-01276-0
3. Kotsis, V., Stabouli, S., Papakatsika, S., Rizos, Z., & Parati, G. (2010). Mechanisms of obesity-induced hypertension. *Hypertension research : official journal of the Japanese Society of Hypertension*, *33*(5), 386–393. https://doi.org/10.1038/hr.2010.9

P-21 - Audit of Hypertensive Retinopathy Assessment in Organ Damage Evaluation

Dr Roser Icart[1], Dr Louise Abrams[1, 1]Homerton Hospital, NHS

Introduction:

The National Institute for Health and Care Excellence (NICE) guidelines recommend fundoscopy as part of the assessment for organ damage in new patients. However, the shift to virtual clinics during the COVID-19 pandemic has posed challenges to the routine practice of fundoscopy. This audit aims to evaluate the current frequency of fundoscopy in clinical practice and gather hypertension specialists' perspectives on its utility.

Methods:

A questionnaire was distributed to members of the British and Irish Hypertension Society. The questionnaire included two mandatory multiple-choice questions and three short-answer questions to elicit opinions. Responses were analysed, summarized as percentages, and grouped based on frequency.

Results:

Analysis included 26 returned questionnaires. Of the respondents, 27% reported routinely performing fundoscopies on all new patients, while 42% performed them only in specific cases. The most common reasons for performing fundoscopy in specific cases were severe hypertension (69%), headaches/visual disturbances (23%), and presence of other organ damage (23%). Additionally, 58% of participants recognized value in performing fundoscopy for all new patients, citing reasons such as skill maintenance, risk assessment, and guiding treatment decisions. However, 42% did not see value in routine fundoscopy, citing reasons such as lack of skills/equipment (42%) and time constraints (33%). Some suggested alternatives, including retinal photography and additional training.

Conclusions:

While the majority of respondents perform fundoscopy, only a minority do so routinely for all new patients. Severe hypertension was the most common indication. Challenges such as lack of skills/equipment and time constraints were cited as reasons for not routinely performing fundoscopy. Given these findings, there may be value in revisiting current guidelines to ensure alignment with evolving evidence and consensus within the field.

Disclosures:

None.

References:

NICE guideline [NG136]: Hypertension in adults: diagnosis and management. Published 28/08/2019; last updated 21/11/2023.

P-22 - Comparison of Medical and Surgical Outcomes in Patients with Evidence of Bilateral Cause for Primary Aldosteronism

Mr William Tan[1], Dr Spoorthy Kulkarni[1], Prof Ian Wilkinson[1, 1]University Of Cambridge

Introduction:

Primary aldosteronism (PA) is a condition characterised by overproduction of aldosterone by adrenal glands. Patients with evidence for bilateral (B/L)-PA (aldosterone is overproduced by both adrenal glands) are treated medically. In some patients with B/L-PA surgical treatment may be undertaken on clinical grounds based on adrenal venous sampling (AVS) and/or other imaging tests. In this retrospective study we aimed to evaluate imaging and AVS indicators for identifying B/L PA and compared the short-term blood pressure (BP) response in B/L PA in patients undergoing surgical versus medical management.

Methods:

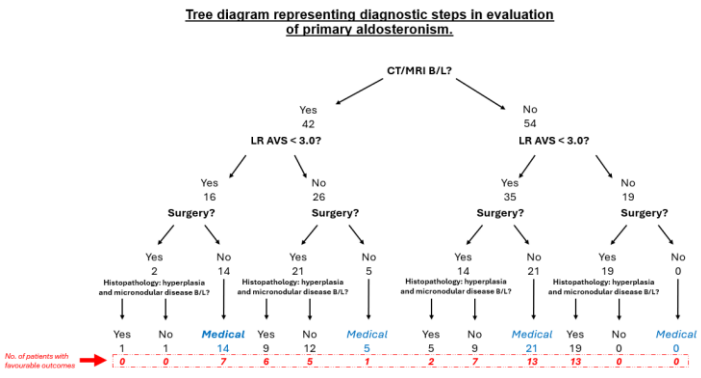
Medical notes of patients (mean age: 49.0 (range: 21 - 71), gender distribution: Males= 61 Females= 35) who underwent AVS and were treated with adrenalectomy or medical therapy for PA in a tertiary hospital (2006-2020) were reviewed. Probable B/L-PA was considered if: 1) B/L imaging finding on Computer Tomography or Magnetic Resonance Scanning or 2) AVS lateralisation index (LI) of < 3 and/or 3) histopathology reported to have adrenal hyperplasia or micronodular disease. Patients were considered to have favourable clinical outcome if BP was <140/90 mmHg post-surgical or medical therapy (1-6 months).

Results:

Out of 96 probable B/L-PA patients, 42 had B/L imaging findings and 51 patients had LI indicative of B/L PA. 40 (41.7%) were managed medically and 56 (58.3%) underwent surgery. Favourable outcomes were observed in 21 (52.5%) patients in the medical group compared to 33 (58.9%) in the surgery group. Clinical response was not related to histopathological findings.

Conclusions:

These findings suggest that imaging alone is insufficient to characterise PA into B/L-PA. Short-term BP outcomes were comparable in medically versus surgically managed PA. However, long term outcomes for both therapies are unknown. This study highlights a need for future work to prospectively study diagnostic algorithms and long-term outcomes in patients with PA.



P-23 - Systemic Hypertension Is Not a Significant Predictor of Positive Stress Echocardiogram

Miss Ademide Zainab Olowosale[1], Miss Ademide Olowosale[1,2, 1]Imperial college London, [2]North West London University Healthcare NHS Trust

Introduction:

Stress echocardiography (SE) is a well-established functional test used to guide the diagnosis of coronary artery disease (CAD) by detecting inducible ischaemia. To evaluate the effectiveness of current referral criteria, we investigated the value of hypertension as a predictor for CAD on SE.

Methods:

We conducted a retrospective study reviewing the electronic health records of 547 consecutive patients who underwent SE between October and December 2022. Outcomes of the SE were recorded, and risk factors, including hypertension, diabetes mellitus, dyslipidaemia, previous history of CAD, smoking, and family history, were identified. The 1-year incidence of revascularisation, major adverse cardiovascular events (MACE) and cardiac mortality were also recorded. Initially, univariate analysis was used to identify which risk factors were associated with CAD, followed by multiple logistic regression to independently assess the odds ratio (OR) of each risk factor.

Results:

Overall, 42 SE were positive for CAD (7.68%), with a positive predictive value of 77.8% when compared to invasive coronary angiogram (ICA). While hypertension was the most common risk factor in the cohort, affecting 344 (62.9%) patients, univariate analysis showed no significant association with CAD ($P = 0.845$). Furthermore, compared to other risk factors, hypertension had the weakest association with CAD in multiple logistic regression ($OR = 0.559$, $P = 0.131$). The only risk factors that were significantly associated with CAD were diabetes mellitus ($OR = 2.20$, $P<0.05$) and previous history of CAD ($OR = 2.71$, $P < 0.01$).

Conclusions:

Despite being the most common risk factor, hypertension was not a significant predictor of a positive SE. Our findings suggest that current referral criteria may not be optimal and further research is warranted to assess the most appropriate risk factors to consider when referring patients for SE.

Disclosures:

None.

P-24 - The Relationship of The KDIGO Heat Map with Pulse Pressure in Patients with Type II Diabetes

Miss Aisha Ahmed[2], Mr Wasem Omar[2], Dr Mustafa Ahmed[1], Dr Omar Ali[1], Dr Maaz Babikar[1]
[1]Imperial College Diabetes centre, [2]Pavel Jozef Šafárik University

Introduction:

The KDIGO heat map is important in referring treatment to patients with high risk of kidney disease progression. Examining the relationship between heat map parameters and pulse pressure (PP) demonstrates how increased risk factors leads to morbidity and mortality among these patients with type II diabetes. (Levey AS, et al.,2024).

Methods:

This cross-sectional study was extracted from the diamond database at the Imperial College Diabetes Centre in Abu Dhabi. This included records of adult patients (over 18 years) with type II diabetes within the last seven years, performing statistical analysis using STATA MP version 17. Patients were only included if they had a urine ACR and GFR performed at least once a year under current guidelines from the American Diabetic Association; axillary staff followed protocol recording blood pressure along with blood and urine tests measuring: age, glomerular filtration rate (GFR), Cockroft gault (ml/min/m2), albumin creatinine ratio (ACR, mg/mmol) - used as variables in the study. (Liu D, et al.,2021; Ndumele CE, et al.,2023).

Results:

Documenting 34,348 patients, 52% female (mean age 58 ± 13; mean GFR 97 ± 26 ml/min/ m2). Utilising multivariate regression analysis, with robust errors, revealed: PP increased by 0.46 mmHg for each year of age ($p<0.001$, 0.8 mmHg for each 100 mg increased in ACR ($p<0.001$), and 0.34 mmHg for each 10 ml/min/m2 decrease in GFR ($p<0.001$). The model explains PP variance ($R2=18\%, p<0.001$) with RMSE of 13.25, key predictors: age ($t=66.01, P<0.001$), ACR ($t=13, P<0.001$), GFR ($t=-9.81, P<0.001$).

Conclusions:

There is a significant increase in pulse pressure with the KDIGO heat-map; this may partially explain increased risks of mortality with Cardiovascular Kidney Metabolic (CKM) Disease in these patients, however further studies are needed to elucidate the specific CKM risk factors for progression of the disease.

Disclosures:

None.

References:

1. Levey AS, Eckardt KU, Dorman NM, et al. Nomenclature for kidney function and disease: report of a Kidney Disease: Improving Global Outcomes (KDIGO) Consensus Conference. Kidney Int. 2024;105 (Suppl 45):S117-S314. doi:10.1016/j.kint.2024.02.010

2. Liu D, Qin P, Liu L, et al. Association of pulse pressure with all-cause and cause-specific mortality. J Hum Hypertens. 2021;35(3):274-279. doi:10.1038/s41371-020-0333-5

3. Ndumele CE, Neeland IJ, Tuttle KR, et al. A Synopsis of the Evidence for the Science and Clinical Management of Cardiovascular-Kidney-Metabolic (CKM) Syndrome: A Scientific Statement From the American Heart Association. Circulation. 2023;148(20):1636-1664. doi:10.1161/CIR.0000000000001186

P-25 - A Mediterranean Style Diet Can Reduce the Pressor Response to Acute Mental Stress in Young Women

Miss Emily Alcock[1], Professor Janice Marshall[1], Dr Catarina Rendeiro[1,][1]University Of Birmingham

Introduction:

In women, ~60% of the risk of cardiovascular disease (CVD) has been attributed to poor diet (1). University students have a poor diet; only ~20% of UK students meet recommendations for fruit and vegetable intake (2). Indeed, endothelium-dependent dilatation was depressed in South Asian (SA) female students who had lower fruit and vegetable intake relative to white Europeans (WEs) (3).

Methods:

South Asian (SA) and White European (WE) female students (9/11 respectively) were recruited as individuals who habitually consumed <4 fruit/vegetable portions/day, to change to a Mediterranean-style diet (MSD) for 4 weeks. Before and after the MSD they undertook an 8-minute mental arithmetic stress test while ABP was recorded by photoplethysmography and forearm total haemoglobin (THb) monitored by near infrared spectroscopy as an index of muscle blood flow. They also completed Food Frequency and Perceived Stress Score (PSS) questionnaires.

Results:

The MSD was followed successfully, eg, fruit/ vegetable intake increased: 363.8±192.0 to 538.8±268.8g/day[§]; §: $p<0.05$, t-test). The increase in mean ABP evoked by mental stress was attenuated from +11.5±10.6 to +8.3±8.2 mmHg** (**; $P<0.001$ RMANOVA) before vs after MSD. Concomitantly, the change in forearm vascular conductance (FVC: THb/ABP) during mental stress was -0.47±0.11 before vs -0.23±0.08**units. In 7SAs/7WEs, FVC decreased (forearm vasoconstriction), whereas in 2SAs/4WEs, FVC increased (vasodilation). Forearm vasodilation during mental stress is nitric oxide (NO)-dependent (4). Vasoconstrictors changed towards vasodilatation after MSD intervention (FVC: -1.01±0.09 vs -0.32±0.09**units).

Cognitive performance during mental stress was improved (129.1±31.6 to 155.4±29.5[§]). PSS was decreased (21.4±7.2 vs 18.3±7.0[§]) .

Conclusions:

When female students change towards a cardioprotective MSD diet for 4 weeks, the pressor response to acute mental stress which a predictor of future CVD (5), is attenuated, while perception of everyday stress is reduced. The attenuated pressor response may reflect improved endothelium-dependent dilatation in limb muscles due to greater NO availability.

Disclosures:

NA.

References:

1. Chomistek AK, Chiuve SE, Eliassen AH, Mukamal KJ, Willett WC, Rimm EB. Healthy lifestyle in the primordial prevention of cardiovascular disease among young women. J Am Coll Cardiol. 2015;65(1):43-51.
2. Tanton J, Dodd LJ, Woodfield L, Mabhala M. Eating Behaviours of British University Students: A Cluster Analysis on a Neglected Issue. Adv Prev Med. 2015;2015:639239.
3. Ali M, Hussein Z, Marshall JM. Young South Asian women in the United Kingdom show evidence of blunted endothelium-dependent dilatation: implications for future cardiovascular disease. J Hypertens. 2022;40(12):2438-48.
4. Dietz NM, Rivera JM, Eggener SE, Fix RT, Warner DO, Joyner MJ. Nitric oxide contributes to the rise in forearm blood flow during mental stress in humans. J Physiol. 1994;480 (Pt 2)(Pt 2):361-8.
5. Chida Y, Steptoe A. Greater Cardiovascular Responses to Laboratory Mental Stress Are Associated With Poor Subsequent Cardiovascular Risk Status. Hypertension. 2010;55(4):1026-32.

P-27 - Age Trends in Antihypertensive Prescribing After Stroke: A Population-Based Study

Dr Kadie-Ann Sterling[1], Dr Melanie Turner[1], Professor Mary Joan MacLeod[1, 1]University of Aberdeen

Introduction:

Hypertension is a major risk factor for new and recurrent stroke. National guidelines recommend the use of renin-angiotensin system (RAS) inhibitors, calcium channel blockers (CCB) or thiazide-like diuretics as first-line therapy for blood pressure management.1 This study aims to explore the association between patient age and the use of these antihypertensives after stroke in Scotland.

Methods:

Stroke cases captured in the Scottish Stroke Care Audit between January 2011 and December 2018 were used for analysis. Stroke data were linked to community prescription data and hospital admission data. Medication use after stroke was defined as least one prescription for any antihypertensive within ninety days of discharge to usual place of residence. Logistic regression was used to assess the effect of age on poststroke antihypertensive prescribing.

Results:

Among the 33 417 stroke patients who survived to six months, 15 538 (46.5%) were women, and 4085 (12.2%) were 85 years and over. Almost half (49.8%) received a prescription for a RAS inhibitor, 34.3% for a CCB, 15.3% for a thiazide and 30.3% for a beta blocker. Following multivariable analysis, RAS inhibitors and thiazide-like diuretics were significantly more likely to be prescribed to patients in the age groups between 55-64, 65-74 and 75-84 years compared with the very elderly patients (≥85 years). While CCBs were significantly less likely to be prescribed to those between 18-64 years compared with the very elderly patients. Independence in activities of daily living, haemorrhagic stroke and less severe stroke were all associated with increased odds of prescription for any antihypertensive after stroke.

Conclusions:

Antihypertensive use after stroke varies across the age spectrum and may be influenced by clinical guidelines, patient physiology, side effects profiles or other clinical factors such as comorbidities.

Disclosures:

None

References:

National Clinical Guideline for Stroke for the UK and Ireland. London: Intercollegiate Stroke Working Party; 2023 May 4. Available at: www.strokeguideline.org.

P-28 - Does Ethnicity Influence the Relationship Between Aldosterone and Early Sign of Cardiac Remodelling? A Cardiovascular Magnetic Resonance Study

Dr Luca Faconti[1], Dr Ryan McNally[1], Dr Emily Haseler[1], Prof Philip Chowienczyk[1], Dr PierGiorgio Masci[1, 1]King's College London

Introduction:

Native T1 and T2 myocardial mapping techniques by cardiac magnetic resonance (CMR) offer quantitative assessments of myocardium composition with T1 manly related to tissue fibrosis and T2 to myocardial oedema. It has been proposed that compared to white individuals, in black subjects water retention/volume expansion driven by aldosterone could be a more prominent contributing factor to hypertension (HT) and hypertensive heart disease. Therefore, we aimed to assess differences in tissue characterization and its relation with plasma aldosterone concentration (PAC) in a dual ethnic cohort of subjects with HT.

Methods:

Subjects with HT underwent a single study visit in which anthropometric measurements, blood tests and a multi-parametric CMR were performed. The latter included quantification of left ventricular mass indexed (LVMI) and native T1 and T2 relaxation times.

Results:

A dual ethnic cohort of 107 subjects (age 45±13 years (mean±SD)), 57% male were recruited. Black subjects (n=64) had higher PAC compared to white individuals (511±339 pmol/l vs 384.3±292 pmol/l, p=0.036) but age, BMI and blood pressure (BP) values were similar (47±14 vs 43±12 years, 29.7±4 vs 28.7±7 Kg/m2, 150±22 vs 148±23 mmHg for systolic BP respectively, all P >0.05). T1 relaxation time was similar between black and white individuals, however LVMI and T2 relaxation time were significantly higher in black subjects (66.7±24.9 g/m2 vs 55.2±10.4 g/m2 and 47.0±2.2 ms vs 45.7±2.2 ms respectively, both P<0.05). In the entire population PAC was significantly correlated with T2 mapping (beta=0.198, P=0.025) and LVMI (beta=0.296, P=0.016) but not T1. We also found a significant interaction between PAC, T2 mapping and ethnicity.

Conclusions:

Ethnic related differences in cardiac remodelling myocardial tissue characterization - with T2 relaxation time likely reflects myocardial inflammation - could be at least in part related to PAC but further studies are warranted to elucidate the potential pathophysiological mechanisms.

Disclosures:

None.

P-29 - Improved Patient Outcomes After Engagement with A Targeted Health Psychology Clinic: Results from A Retrospective Study

Ms Sian Jenkins[1], Dr Ainslea Cross[1], Prof. Kamlesh Khunti[1], Dr Pankaj Gupta[1,2], [1]University Of Leicester, [2]University Hospitals of Leicester NHS Trust

Introduction:

Despite hypertension medications being widely available, many patients have poorly controlled blood pressure. The reasons for this vary, but alternative interventions are required to support patients. Consequently, we established a novel psychologist led clinic to provide additional support to help patients improve blood pressure control and psychological wellbeing. This study aimed to understand the effect of the psychologist-led clinic on patient blood pressure and psychological wellbeing.

Methods:

Clinic notes of all patients referred from the hypertension clinic to the psychologist between September 2020 and May 2023 were reviewed. Demographics and pre/post clinic blood pressure was measured. Psychological wellbeing was assessed qualitatively using clinic notes.

Results:

The analysis included 30 patients. Reasons for clinic referrals included anxiety, stress and weight loss. The median age was 54 (IQR:42-65) years and 53% were female. The median number of visits was 4 (IQR: 3-6). In total, 83% of patients showed an improvement following clinic engagement, in either blood pressure (N=16) (-10mmHg SBP), wellbeing (N=17), or both (N=8). A paired Student's t-test showed that the systolic blood pressure change was significant (P=0.04; 95% CI [0.24-0.89]), but non-significant for diastolic blood pressure (P=0.34; 95% CI [-0.21 - 0.62]). Qualitative analysis identified four key outcomes: improved psychological wellbeing, changes in health management and behaviour, improved health related outcomes and three patients had no qualitative reported improvements.

Conclusions:

This study shows that a health psychologist led clinic based intervention can support patients with hypertension management. Overall 83% of patients who attended the clinic had an improvement in their health either related to blood pressure reduction or wellbeing improvement. The latter is important considering the benefit of a holistic approach to hypertension management. Further research needs to establish who this intervention will be most suitable for, and the most effective mode of delivery.

Disclosures:

No disclosures.

P-30 - Hypertensive Complex Aortic Disease: An Observational Study

Dr Alfredo Petrosino[1], Dr Sai Krishna Duraisingham[1], Dr Keith Siew[1], Dr Michael Quail[2], Dr Jennifer M Cross[1], Professor Stephen B Walsh[1, 1]London Tubular Centre, UCL Department of Renal Medicine, UCL, [2]Centre for Cardiovascular Imaging, UCL Institute of Cardiovascular Science & Great Ormond Street Hospital for Children

Introduction:

Aortic coarctation, in which the thoracic and/or abdominal aorta are hypoplastic, often presents in childhood/early adulthood with resistant hypertension and subsequent end-organ damage. This observational study describes an adult cohort referred to a subspecialist Renovascular Hypertension clinic.

Methods:

Retrospective analysis of patients with aortic coarctation referred to Renovascular Clinic and in active follow-up at any point since 2012. Data on demographics, clinical presentation, interventions, and outcomes were collected and analysed appropriately for distribution.

Results:

The cohort comprised 12 hypertensive patients (males/female ratio 2:1), mostly Caucasian (11), with mean age at referral of 29 years (15.8-42.3). Aortic disease involved the aortic arch in four, the distal thoracic/abdominal aorta in nine and the aorta throughout in two patients. Nine patients had renal arterial stenoses; five had solitary kidney; two had associated cardiac defects. In seven, the disorder was considered a congenital large vessel development abnormality, in five fibromuscular dysplasia and in one Takayasu's vasculitis. One case had Williams Syndrome. Four patients underwent aortic interventions (aged 10 or below). Four patients required renal artery angioplasty, and two of them stenting. Six patients had surgical renal revascularisation: four underwent renal bypass (for in-stent stenosis, bilateral or in single kidney) and two renal auto-transplantation (for renal artery aneurysm and dissection). Three patients with functional solitary kidney had undergone surgical nephrectomy (mean age 12) due to hypertension and recurrent infections. Mean initial eGFR was 100.9 ml/min/1.73m2 (86.5-115.3). All patients were hypertensive, on average on two agents, the majority on Renin-Angiotensin-Aldosterone inhibitors (10). The estimated eGFR decline was 1.95 ml/min/1.73m2/year over a mean 8.5-year follow-up (5.16-11.9). None of the patients progressed to End-Stage Renal Disease.

Conclusions:

Adults with hypertensive aortic disease benefit from intensive treatment in a specialist centre. In this context, they appear to have low risk of progression toward renal failure.

P-31 - Kidney Autotransplantation and Renal Artery Bypass in Renovascular Hypertension: Data from a London Cohort

Dr Alfredo Petrosino[1], Dr Sai Krishna Duraisingham[1], Dr Kieth Siew[1], Dr Jennifer M Cross[1], Mr Jason Constantinou[2], Mr Colin Forman[2], Professor Stephen B Walsh[1, 1]London Tubular Centre, UCL Department of Renal Medicine, UCL, [2]Department of Vascular Surgery, Royal Free Hospital NHS Foundation Trust

Introduction:

Surgical Renal revascularisation is usually reserved when percutaneous techniques are unfeasible or have failed. We describe a cohort of hypertensive patients who underwent auto-transplantation or renal bypass surgery for complex renovascular disease.

Methods:

Retrospective analysis of the cohort of patients receiving surgical renal revascularisation and in active follow up at any point since 2012 in a subspecialist Renovascular clinic. Data on demographics, renal artery disease, interventions and outcomes were collected, and statistical analysis was performed appropriate to distribution.

Results:

21 patients were identified. The average age at referral was 43 years. The aetiology of renovascular disease included fibromuscular dysplasia (FMD), midaortic syndrome, isolated renal artery aneurysm and atherosclerotic renal artery disease. Six patients had solitary kidneys. Renal artery stenosis was confirmed in 10 cases. Percutaneous angioplasty had already been performed on six patients, four of which also received stenting. 11 renal auto-transplantations and 10 renal artery bypasses constituted the surgical interventions. Mean age at intervention was respectively 45.8 and 36.1 (45.8 and 14.2 when excluding atherosclerotic disease). Main indications for auto-transplantation included renal artery aneurysms (eight), failed angioplasty in progressing FMD, renal artery dissection, and poorly controlled hypertension. Main indications for renal artery bypass were progressing FMD (five, three following stenting) and progressing atherosclerotic disease despite stenting in solitary kidney (two). One auto-transplantation failed due to complex vascular anomalies. Mean GFR at referral was 86.73 ml/min/1.732. The estimated GFR decline was 0.89 ml/min/1.732/year over a mean 8.4-year follow-up. Hypertension treatment required on average 1.6 agents before and 2.3 after revascularisation. No one developed end-stage renal disease.

Conclusions:

Surgical intervention for renovascular disease unamenable or resistant to percutaneous intervention is safe and successful when carried out in a specialist centre. This cohort may represent an intriguing in vivo model for physiological studies on the effects of renal denervation.

P-32 - Pharmacist Interventions in The Control of Hypertension and Adherence to Antihypertensive Treatment: A Systematic Review and Meta-Analysis of Randomised Controlled Trials

Dr Ryan McNally[1], Miss Vivien Teo[1], Mr Imran Hafiz[2], Dr Alison Wright[1], Mr Benjamin Waters[2], Dr Luca Faconti[1], Dr Jig Patel[1], Dr Jennifer Stevenson[1], Professor Phil Chowienczyk[1], Professor John Weinman[1, 1]King's College London, [2]nd. Thomas' Hospital

Introduction:

Medication non-adherence is a leading cause of unsatisfactory blood pressure (BP) control and has a significant NHS cost burden. Pharmacists play an important role in the management of hypertension and non-adherence due to their ideal position to promote optimal use of medication. This study aimed to evaluate the efficacy of pharmacist-delivered interventions for adults with hypertension and examine the intervention characteristics associated with greater efficacy.

Methods:

Systematic review and meta-analysis of randomized controlled trials (RCTs). Embase, CENTRAL, MedLine, Psychinfo and CINAHL were used. Eligible studies were RCTs including adult patients with hypertension where a pharmacist intervention (alone or collaborative care) targeting BP control was compared with control (usual care). The primary outcome was change in BP. Secondary outcomes included % achieving BP control and adherence to treatment. We extracted data on sample and intervention characteristics. Meta-analysis was performed using Comprehensive Meta-Analysis Software v4. Moderator analyses examined the association between intervention effects and intervention features.

Results:

2402 articles were retrieved. After removal of duplicates, 1538 were screened by title and abstract against the inclusion criteria. 88 studies with 25,516 participants were included. Mean intervention duration was 7.2 months (range 1-14 months). The overall pooled mean differences in systolic BP (SBP) and diastolic BP (DBP) between pharmacist intervention and control were -7.39 (-8.56, -6.23) mmHg and -3.99 (-4.61, -3.37) mmHg respectively, both $P<0.001$. With BP control, pharmacist interventions caused a significant increase in those achieving BP control compared to usual care (+21 (16.88, 25.27) %, $P<0.001$) and a significant increase in treatment adherence. Duration of intervention had no influence on change in SBP or DBP (both $P>0.05$).

Conclusions:

Pharmacist interventions in hypertension significantly reduced SBP and DBP and improved BP control. Identifying the characteristics of the most effective interventions can lead to better treatment adherence and BP-lowering in patients with hypertension.

Disclosures:

None.

P-33 - A Systematic Review of the Reference Ranges of the Proteomic Biomarkers of Hypertension: The Renin-Angiotensin and Kallikrein-Kinin Systems

Mr Elliot John Gyedu[1], Dr Pankaj Gupta[1], Dr Dennis Bernieh[1], Ms Sian Jenkins[1, 1]University Of Leicester

Introduction:

The renin-angiotensin and kallikrein-kinin systems are associated with the development of hypertension. Recently some peptides in these systems have been discovered to be vasodilative and reduce blood pressure. However, there is no consensus of all the peptides in a healthy and hypertensive populations. The aim of this systematic review was to record the circulating levels of all the RAS and KKS peptides in the said populations in observational studies and the factors which influence them. This would help to investigate the levels of the peptides and their clinical diagnostic and treatment utility for hypertension.

Methods:

A systematic review was conducted using MEDLINE/SCOPUS/Web of Science/Cochrane/ to identify relevant studies from inception until 31st July 2023 and included all studies in English of normotensive adults or hypertensive adults not on anti-hypertensive medication, with the circulating RAS and KKS peptides measured. Data was analysed using R.

Results:

The initial search identified 7600 papers and on screening, 30 studies were found to meet the inclusion criteria. A total of 2032 normotensive participants and 80 hypertensive patients not on medications were studied. The mean age range was from 26.5 to 64 years and ethnicity was only reported for 3 studies. The mean levels of the peptides which reduce blood pressure where significantly higher in normotensive participants when compared to hypertensive patients not on anti-hypertensive medications.

Conclusions:

This is the first systematic review to investigate all the levels of the RAS and KKS peptides in healthy and hypertensive populations. The quality of the data was heterogenous and variable. The peptides which reduce blood pressure have the potential to be used as clinical diagnostic markers.

References:

1. Pattanaik, S. (2020). Biomarkers in essential hypertension. Elsevier.
2. Paz Ocaranza, et al. (2020). Counter-regulatory renin–angiotensin system in cardiovascular disease. Nature Reviews Cardiology.

P-34 - First-Phase Ejection Fraction Prognostic Value: A Systematic Review

Miss Rahaf Alshehri[1], Dr Samuel Burden[1], Miss Tanisha Rajah[1], Prof Phil Chowienczyk[1], Dr Haotian Gu[1, 1]King's College London

Introduction:

First phase ejection fraction (EF1) is a simple but robust measure of early left ventricular systolic function. This study is to assemble evidence that EF1 is an accurate and sensitive marker in predicting cardiovascular outcomes, compared to ejection fraction (EF) and global longitudinal strain (GLS).

Methods:

A systematic review of the literature was conducted according to the Preferred Reporting Items Systematic reviews and Meta-Analyses (PRISMA) protocol. An electronic search of all English publications from PubMed and Embase via Ovid databases was undertaken. All studies which compared EF1 against EF and GLS in predicting cardiovascular outcomes were included. The primary outcome was all-cause mortality and the secondary outcome was a composite of death, hospitalization due to heart failure, cardiac intervention or coronary ischaemic event.

Results:

Review was conducted from 10 published full research articles that included 2538 adults comprising 2 prospective and 8 retrospective observational studies between 2017 and 2024. The underlying cardiac diseases were aortic stenosis, heart failure, heart transplant and COVID-19. Overall, EF1 was found to be an independent predictor of adverse events.

Conclusions:

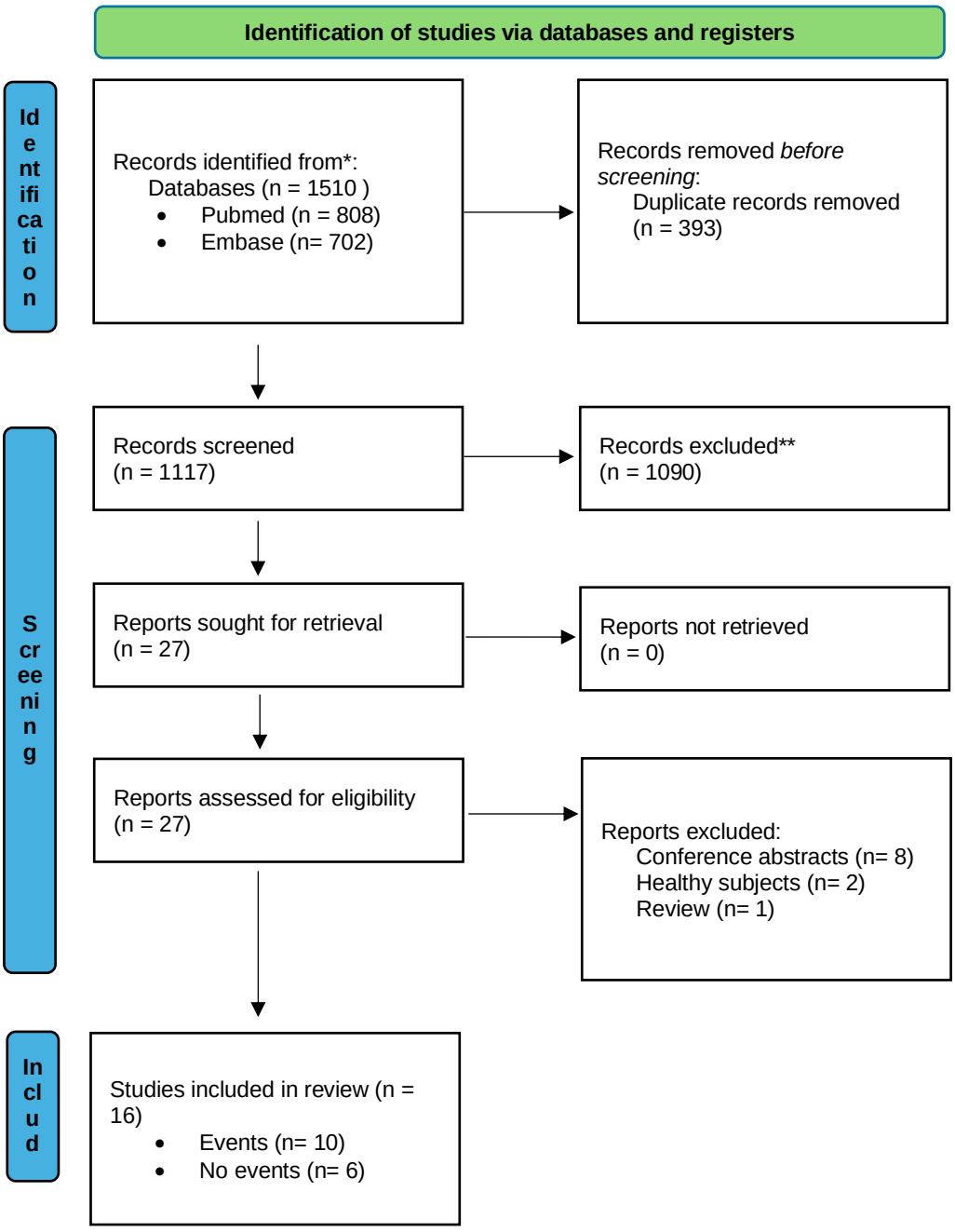
Our systematic review suggested that the prognostic value of EF1 appears to superior to EF and GLS for predicting adverse cardiovascular events. A lower EF1 (<25%) was associated with poorer outcomes.

Disclosures:

HG and PC are named on a patent of EF1.

References:

Bing R, Gu H, Chin C, et al. Determinants and prognostic value of echocardiographic first-phase ejection fraction in aortic stenosis. Heart. 2020;106(16):1236-1243. doi:10.1136/heartjnl-2020-316684


Identification of studies via databases and registers
Identification
Records identified from*:
Databases (n = 1510)
Pubmed (n = 808)
Embase (n= 702)
Records removed *before screening*:
Duplicate records removed (n = 393)
Screening
Records screened
(n = 1117)
Records excluded**
(n = 1090)
Reports sought for retrieval
(n = 27)
Reports not retrieved
(n = 0)
Reports assessed for eligibility
(n = 27)
Reports excluded:
Conference abstracts (n= 8)
Healthy subjects (n= 2)
Review (n= 1)
Includ
Studies included in review (n = 16)
Events (n= 10)
No events (n= 6)

P-35 - Effectiveness of Stress Management and Relaxation Interventions for the Management of Hypertension and Pre-Hypertension: A Systematic Review and Network Meta-Analysis

Dr Monika Halicka[1], Dr Katie Webster[1], Dr Russell Bowater[1], Dr Jelena Savović[1], Dr Alyson Huntley[1], Ms Sarah Dawson[1], Dr Christopher Clark[2], Dr Rachel Johnson[1], Professor Julian Higgins[1], Professor Deborah Caldwell[1], [1]University Of Bristol, [2]University of Exeter

Introduction:

Worldwide, hypertension affects more than 30% of people aged 30-79 years1, and is a major risk factor for cardiovascular, cerebrovascular and peripheral arterial disease. Although medication is a mainstay of treatment, non-pharmacological interventions such as lifestyle and behavioural changes, have long been recognized as an important adjunct in blood pressure control and are first-line recommendations for treatment by many international guidelines. A priority setting exercise including patients, researchers and healthcare professionals, identified stress management interventions as a top ten research priority for hypertension2. In the UK, NICE has also recommended future research into relaxation therapies for hypertension3.

Methods:

We report a systematic review and network meta-analysis of stress management and relaxation Interventions for adults with hypertension (BP ≥140/90mmHg) and pre-hypertension (BP ≥120/80mmHg). Interventions include yoga, tai chi, mindfulness-based stress reduction, meditation and other stress-management interventions. The primary outcomes are systolic and diastolic blood pressure.Studies at low risk of bias will be quantitatively synthesised using a random effects network meta-analysis (NMA). NMA allows the comparative effectiveness of active interventions to be estimated relative to every other intervention in the network, even in the absence of direct head-to-head studies.

Results:

We have extracted data from 183 included studies published between 1975 and 2024. Studies were conducted in 31 different countries, lasted from 1 to 36 months, and randomised almost 15,000 people. Results from network meta-analysis of these studies will be presented at the conference.

Conclusions:

Identification of effective non-pharmacological interventions for blood pressure control has the potential to improve blood pressure management – and consequently cardiovascular outcomes – for millions of people worldwide. The use of effective stress management techniques as an alternative or adjunct to pharmacological treatments may empower people to manage their own blood pressure, and provide a novel, evidence-based approach for the management of hypertension in primary care.

Disclosures:

CC is a Committee Member for the NICE guideline Hypertension in adults: diagnosis and management (update). None of the other authors have any competing interests to declare.

British and Irish Hypertension Society
Committed to preventing cardiovascular disease

References:

1. Zhou B, Carrillo-Larco RM, Danaei G, Riley LM, Paciorek CJ, Stevens GA, et al. Worldwide trends in hypertension prevalence and progress in treatment and control from 1990 to 2019: a pooled analysis of 1201 population-representative studies with 104 million participants. The Lancet 2021;398(10304):957-80. http://dx.doi.org/10.1016/S0140-6736(21)01330-1
2. Khan N, Bacon SL, Khan S, Perlmutter S, Gerlinsky C, Dermer M, et al. Hypertension management research priorities from patients, caregivers, and healthcare providers: A report from the Hypertension Canada Priority Setting Partnership Group. The Journal of Clinical Hypertension 2017;19(11):1063-9. http://dx.doi.org/https://doi.org/10.1111/jch.13091
3. NICE. Hypertension in adults: diagnosis and management. 2019. URL: https://www.nice.org.uk/guidance/NG136 (Accessed 16 April 2024).

P-36 - Quality of Life after MIDCAB vs PCI: A Systematic Review

Mr Jordan Tumes[1, 1]University Of Liverpool

Introduction:

Approaches to restore blood flow due to Coronary artery disease (CAD) include percutaneous coronary intervention (PCI) and with technological advancements, minimally invasive coronary artery bypass grafting (MIDCAB). For ST-elevated myocardial infarcts, PCI is the preferred treatment of choice, however for non-ST elevated acute coronary syndromes the best intervention is still poised to be determined.1 Post-operative cardiac endpoints usually focus on major adverse cardiac events; however, health related quality of life (HRQOL) is an important outcome measure and should be taken into consideration when deciding which intervention is most appropriate.
Objective of Systematic review: To assess HRQOL following MIDCAB vs PCI due to CAD.

Methods:

A systematic literature search from inception to 24th of January 2024 was performed for studies comparing HRQOL following MIDCAB vs PCI as a result of CAD. The Critical Appraisal skills program (CASP) tools were used to critically appraise the methodological quality of the included studies.2

Results:

Four studies with a total of 410 participants were included.3456 Three randomised trials and one cohort study reported results from three months to seven years post-intervention. Three studies reported no statistically significant difference in HRQOL between interventions. One randomised trial reported a statistically significant benefit for HRQOL within the mental component SF-36 in favour of MIDCAB at one year ($p = 0.04$).4

Conclusions:

Little significant difference in health-related quality of life is seen between MIDCAB and PCI across all timepoints in people with non-ST elevated acute coronary syndromes. Where statistical differences were present, one study reported an aspect of the mental component at one year follow up in favour of MIDCAB. More future research is needed in the use of modern techniques such as the second-generation drug-eluting stents, total endoscopic robotic assisted procedures, off-pump bypass, and hybrid approaches that combine both techniques.

Disclosures:

None.

References:

1. Robert A Byrne, Xavier Rossello, J J Coughlan, Emanuele Barbato, Colin Berry, Alaide Chieffo et al. ESC Scientific Document Group , 2023 ESC Guidelines for the management of acute coronary syndromes: Developed by the task force on the management of acute coronary syndromes of the European Society of Cardiology (ESC), European Heart Journal, Volume 44, Issue 38, 7 October 2023, Pages 3720–3826, https://doi.org/10.1093/eurheartj/ehad191
2. CASP Checklist C. Critical Appraisal Skills Programme 2023, viewed 15/3/2024. Available from: https://casp-uk.net/casp-tools-checklists/.
3. Blazek S, Rossbach C, Borger MA, Fuernau G, Desch S, Eitel I et al. Comparison of sirolimus-eluting stenting with minimally invasive bypass surgery for stenosis of the left anterior descending coronary artery: 7-year follow-up of a randomized trial [Journal article]. JACC Cardiovascular interventions. 2015;8(1 Pt A):30-38. doi:10.1016/j.jcin.2014.08.006. Cited in: Pubmed; PMID CN-01048898.
4. Reeves BC, Angelini GD, Bryan AJ, Taylor FC, Cripps T, Spyt TJ et al. A multi-centre randomised controlled trial of minimally invasive direct coronary bypass grafting versus percutaneous transluminal coronary angioplasty with stenting for proximal stenosis of the left anterior descending coronary artery. Health Technol Assess. 2004 Apr;8(16):1-43. eng. doi:10.3310/hta8160. Cited in: Pubmed; PMID 15080865.
5. Thiele H, Neumann-Schniedewind P, Jacobs S, Boudriot E, Walther T, Mohr FW et al. Randomized Comparison of Minimally Invasive Direct Coronary Artery Bypass Surgery Versus Sirolimus-Eluting Stenting in Isolated Proximal Left Anterior Descending Coronary Artery Stenosis [Article]. Journal of the American College of Cardiology. 2009;53(25):2324-2331. doi:10.1016/j.jacc.2009.03.032.
6. Stessel B, Nijs K, Pelckmans C, Vandenbrande J, Ory JP, Yilmaz A et al. Neurological outcome after minimally invasive coronary artery bypass surgery (NOMICS): An observational prospective cohort study [Article]. PLoS ONE. 2020;15(12 December). doi:10.1371/journal.pone.0242519.

P-37 - The Effect of Lifestyle Factors on the Risk of Developing Cardiovascular Disease (CVD) in Women with a History of Hypertensive Disorders of Pregnancy (HDP): A Narrative Systematic Review

Mrs Bolanle Opeyemi Brikinns[1], Ms Zahra Pasdar, Professor Phyo Khaw Myint, Professor Kay Cooper, [1]University of Essex, [2]University of Aberdeen (NHS Grampian)

Introduction:

Hypertensive disorders of pregnancy (HDP) are associated with increased risk of future cardiovascular disease (CVD). Less is known regarding the effect of lifestyle factors on the development of this risk. We review the evidence for the impact of lifestyle factors on CVD risk in women with previous HDP to inform health professionals on the necessity to these, especially in their later life.

Methods:

A narrative systematic review of 4 databases (MEDLINE, Embase, Cochrane and CINAHL) were searched from inception-31/05/2023. A hand search was also done reviewing the references of those selected papers. All searches were limited to English language & Humans. Study inclusion criteria: (i) Women with a pregnancy comparing (ii) Those with Hypertensive disorders in pregnancy (HDP) and their lifestyles with (iii) Those without HDP and their lifestyles and (iv) Their Future CVD risk. The Newcastle Ottawa scale was used to assess study quality. Heterogenous studies were presented narratively.

Results:

Two studies of good/fair quality were included, with 24,200 women (9.3% HDP). One study found evidence of higher odds of hypertension and abnormal biomarkers linked with HDP among overweight and obese women. Blood pressure and body mass index showed an excess CVD risk of about 77% in women with HDP; glucose and lipids were associated with smaller proportions of excess CVD risk in women with HDP.

Conclusions:

Our result demonstrates limited studies investigate the direct effect of lifestyle factors in women with previous HDP and future CVD risk, highlighting the need for further evidence. Women with HDP history also require longer follow-up alongside lifestyle modifications beyond post-partum and earlier years following pregnancies. More observational studies are required to assess the direct effect of lifestyle factors on CVD risk in women with HDP, and randomised controlled trials, to identify risk mitigation factors.

Disclosures:

No commercial conflict of interests

References:

1. Gamble, D., Brikinns, B., Myint, PK and Bhattacharya, S. (2019) Hypertensive Disorders of Pregnancy and Subsequent Cardiovascular Disease: Current National and International Guidelines and the Need for Future Research.
2. National Institute for Health and Care Excellence. (2021) a Antenatal care. Available from: https://www.nice.org.uk/guidance/ng201 [Accessed 23.08.2023].

P-38 - Ambulatory Blood Pressure Patterns in Giant Cell Arteritis and Polymyalgia Rheumatica with Glucocorticoid Excess: A Systematic Review

Dr Katrina Freimane[1], Dr Timon Blakemore Kocadag[1], Dr Oliver Todd[2], Dr Sarah Mackie[3], [1]Bradford Institute for Health Research, Bradford Teaching Hospitals NHS Trust, [2]Bradford Teaching Hospitals NHS Foundation Trust; Academic Unit for Ageing and Stroke Research, University of Leeds, [3]Leeds Institute of Rheumatic and Musculoskeletal Medicine, University of Leeds; Leeds Biomedical Research Centre, Leeds Teaching Hospitals NHS Trust

Introduction:

Polymyalgia Rheumatica (PMR) and Giant Cell Arteritis (GCA) are characterised by arterial and musculoskeletal tissue inflammation and treated with long-term glucocorticoids. A higher risk of incident hypertension has been shown in this group [1], but whether this relates to the inflammatory process or glucocorticoid excess is unclear. Ambulatory blood pressure measurement (ABPM) is the most reliable method of recording blood pressure (BP). We performed a systematic review of evidence on the association between glucocorticoid excess and ABPM in patients with PMR/GCA.

Methods:

A focused Medline search identified no studies investigating glucocorticoid excess and ABPM in patients with PMR/GCA. A surrogate population with endogenous/exogenous glucocorticoid excess was used instead. We included all analytical study types recruiting participants aged ≥18 years. We excluded studies with severe systemic disease, organ transplant, adrenal insufficiency or pregnancy. Screening and data extraction were performed independently by two researchers, with disagreements resolved with a third reviewer.

Results:

15 studies (973 participants, range 6 to 628) were included, 9 examining endogenous glucocorticoid excess and 6 exogeneous excess. 9 of 14 studies examining nocturnal BP dipping showed non-dipping was higher in participants with glucocorticoid excess compared to those without. Higher average daytime (3 of 8 studies) and 24-hour systolic (4 of 8 studies) BP was demonstrated in participants with glucocorticoid excess compared to those without.

Conclusions:

Glucocorticoid excess is associated with ABPM profiles characterised by absent nocturnal dipping and higher systolic BP. Comparing ABPM profiles of patients with glucocorticoid excess to those who also have PMR/GCA may help determine whether the higher incidence of hypertension in PMR/GCA relates to the underlying disease process or long-term glucocorticoid treatment.

Disclosures:

No commercial conflicts of interest.

References:

1. Mebrahtu TF et al. Oral glucocorticoids and incidence of hypertension in people with chronic inflammatory diseases: a population-based cohort study. CMAJ. 2020,23;192(12):E295-E301.

P-39 - A Systematic Review of Blood Pressure Device Validation Studies Published Since January 2018

Dr Rosina Cross[1], Dr Chris Clark[1], Professor Richard McManus[2], Dr Sinead McDonagh[1], Miss Nia Roberts[2], Dr Peter Lacy[4], Dr Neil Chapman[5], Professor Philip Lewis[3], Professor Barry McDonnell[6], Professor Phil Chowienczyk[7], Dr James Curneen[8], Ms Theresa Santhosh[1], Ms Hermione McLeish[1]
[1]University Of Exeter, [2]University of Oxford, [3]Stockport NHS Foundation Trust, [4]University College London, [5]Imperial College Health Trust, [6]Cardiff Metropolitan University, [7]Kings College London, [8]University of Galway

Introduction:

Effective management of hypertension and cardiovascular risks requires blood pressure (BP) monitors to be validated and accurate. Several validation protocols have been used historically, however, not all commercially available BP monitors have passed validation protocols. The British and Irish Hypertension Society (BIHS) maintains the only peer-reviewed list of validated BP monitors for home and specialist use that is independent of commercial interest. The list is cited in NICE hypertension guidance as a resource to guide monitor choices. Following development of the Universal Standard for BP device validation there is a need to update the literature review underpinning the maintenance of the BIHS list. This systematic review of validation studies to aims to identify validation studies published since the last update and review validation studies for compliance with relevant protocols.

Methods:

Systematic review methods were used to search relevant databases (Medline, Embase) to identify blood pressure monitor validation studies published since 2018. The review is registered with PROSPERO. Included studies will be compared to relevant validation criteria for accuracy of reporting.

Results:

After de-duplication, 1237 citations were screened independently by two authors using Covidence and 112 validation studies identified for inclusion. Data from included studies are being extracted and assessed for protocol compliance prior to addition to the BIHS list. Full results will be presented to the Annual Scientific Meeting

Conclusions:

The systematic review will provide an updated list of BIHS approved validated blood pressure monitoring devices for ambulatory, clinic, home and specialist use. This work will establish an ongoing update process for identification of new blood pressure monitors to maintain the BIHS list for the future. Implications of the review findings for reliability of published validation studies and plans for the future will be presented to the Annual Scientific Meeting.

Disclosures:

Funding: BIHS Legacy fund and South West GP Trust
Prospero registration number: 480953

P-40 - Patient-Led Interventions to Manage Symptoms and Episodes of Atrial Fibrillation: A Mixed-Methods Study

Dr Rosina Cross[1], Dr Christopher Clark[1], Dr Sinead McDonagh[1], Dr Manish Gandhi[2], Professor Rod Taylor[3], Ms Jayne Fordham[4,] [1]University Of Exeter, [2]Royal Devon University Healthcare NHS Foundation Trust, [3]University of Glasgow, [4] Mid Devon Medical Practice.

Introduction:

Atrial fibrillation (AF) is the commonest cardiac arrhythmia, affecting 1.4 million adults in England. Up to 25% experience paroxysmal AF, with episodes interspersed with periods of normal sinus rhythm. AF is associated with reduced health-related quality-of-life (HRQoL) and psychological and physical symptoms occur including anxiety, palpitations, dyspnoea, fatigue and cognitive decline. AF carries future risks of stroke and heart failure. Reducing episodes of AF may reduce progression to permanent AF or development of complications. Lifestyle interventions are essential to improving AF outcomes, yet they are poorly articulated in clinical guidelines for management of AF. Evidence supports participation in rehabilitation to improve functional and HRQoL outcomes with AF, but it is not routinely offered. Interventions to encourage exercise alongside weight loss, smoking cessation and alcohol reduction appear beneficial in reducing episodes and progression of AF. However, there is uncertainty over the optimum type, duration and intensity of exercise. It is unknown whether exercise choices can be individualised to optimise rate and rhythm control or reduce future risks. Currently, evidence for lifestyle interventions is poorly translated into accessible practical resources for people with AF. We aim to synthesise the evidence for effective lifestyle interventions in AF to inform design of a self-help and exercise-based resource for patients.

Methods:

Umbrella review: searches of Medline, Embase, CINAHL, Cochrane database, PsycINFO and Epistemonikos were conducted in May 2024. Titles, abstracts and full texts for reviews will be screened independently by two authors using Covidence (Veritas Health Innovation, Melbourne, Australia). Data from included studies are being extracted and compared against templates of protocol criteria for validation.

Results:

Results will be presented to the Annual Scientific Meeting

Conclusions:

Finding from this umbrella review will inform the design of a self-help resource for people with AF.

Disclosures:

NIHR School for Primary Care Research grant no: 706

P-41 - Trends in Hypertension Prevalence and Control in England Over the Last 3 Decades: Health Survey of England 1994-2019

Dr Jai Prashar[1], Dr Catherine Graham[1], Dr James Steckelmacher[1], Mr Maxim Capel, Dr Ayesha Ahmed[1], Professor Neil Poulter[2], Professor Peter Sever[2], Dr Ajay Gupta[1], [1]Queen Mary University of London, [2]Imperial College London

Introduction:

Globally, elevated blood pressure (BP) leads to over 10.8 million preventable deaths from cardiovascular (CV) and renal disease1. Assessing national trends in BP control among hypertensive patients informs the effectiveness of existing strategies.

Methods:

Analysing data from 13 nationally representative health surveys in England spanning 1994-2019, we examined BP control and hypertension awareness trends over 25 years. We used 'period definitions' to define hypertension and BP control at the time of each coinciding survey, facilitating accurate comparison of trends, while accounting for changes in understanding, definitions, and medical practices. Analyses were also conducted using 'current definitions' (i.e. definition of hypertension and BP control targets as per NICE 2023), applied across the entire duration. Sample weights were applied to account for oversampling and nonresponse, and analysis was conducted using Python, STATA, and Join Point regression software.

Results:

In England, hypertension prevalence initially surged by 8% from 23.3% after lowering the BP cutoff in 1999, stabilising at 32-34% until 2011, then plateauing at 31-32% with a marginal 1.5% improvement over the 25 years. Population-wide, systolic (S) and diastolic (D) BPs decreased (8.5mmHg and 3.8mmHg respectively), with greater reductions among diagnosed hypertensives. While applying the current BP target suggests improvement, applying 'period definitions' of BP targets at that time shows 'no change' in the proportion of diagnosed hypertensives with uncontrolled BPs over last 25 years. Detection of undiagnosed hypertension has remained stagnant since BP cut-offs were lowered in 1999.

Conclusions:

Despite slight reductions in hypertension prevalence and population-wide BP, the proportions of those with known hypertension with uncontrolled BPs have remained static, despite improvement in medications and practice, challenging the effectiveness of current policies and clinical pathways. Detection of undiagnosed hypertension also remains largely unchanged. These findings underscore the need to reassess and enhance existing strategies to mitigate cardiovascular risk on a population scale.

Disclosures:

None.

References:

1. Forouzanfar, M. H., Liu, P., Roth, G. A., Ng, M., Biryukov, S., Marczak, L., ... Murray, C. J. (2017). Global Burden of Hypertension and Systolic Blood Pressure of at Least 110 to 115 mm Hg, 1990-2015. JAMA, 317(2), 165-182. doi: 10.1001/jama.2016.19043. Erratum in: JAMA. (2017). 317(6), 648. PMID: 28097354.