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Highlights From the American Heart Association's Joint Hypertension 2018 Scientific Sessions

Brandi M. Wynne, MS, PhD; Hana A. Itani, PhD

The 2018 American Heart Association's (AHA) Council on Hypertension, AHA Council on Kidney in Cardiovascular Disease (KCVD), and the American Society of Hypertension (ASH) combined efforts to host one of the most important joint meetings in cardiovascular disease. This year's meeting was a remarkable 3-day scientific session developed by program committee members led by Dr Karen Griffin (Hypertension 2018 Programming Chair), for both clinical and basic researchers focusing on recent advances in hypertension research on September 5th to 9th in Chicago, IL. This meeting is a clear exhibit of the Council on Hypertension's mission "to foster excellence in hypertension research and education" in order to achieve the AHA's goal "to build healthier lives, free of cardiovascular diseases and stroke."

Attendees had the opportunity to connect with cross-disciplinary researchers and clinicians from around the world who investigate cardiac and kidney disease, stroke, obesity, and genetics in hypertension. A highlight of the meeting is always the interactive trainee sessions designed to benefit trainees and early career investigators, which included a trainee poster session to highlight innovative research and how-to sessions that provided in-depth information about a range of topics related to the study of hypertension. To emphasize a greater clinical focus this year, the Primary Care and Clinical Practice Clinical Science Tracks were added to the program. This joint meeting hosted hundreds of oral and poster presentations on basic, clinical, and population research related to hypertension. Several Council on Hypertension awards for established researchers, new investigators, and

young trainees were awarded at the annual meeting, including the Excellence in Hypertension Research Award, the most prestigious award in this field. A number of new and exciting initiatives are planned for the Council in the coming years, including an increased number of concurrent oral sessions, mentoring and outreach programs, increased emphasis on clinical and translational research, hypertension case presentations, and the continued development of the AHA Hypertension Journal–sponsored "Recent Advances in Hypertension" Sessions.

Recent Advances in Hypertension

The ASH partnered with the AHA and as a result, this meeting gathered members from all aspects of the field of hypertension, from research to clinical practice to public health. The science presented at this year's meeting was remarkable and allowed for an up-to-date review on the development of hypertension, the mechanisms of target organ injury, and the most effective means for the detection, evaluation, and management of high blood pressure across diverse populations. Dr Jan Basile gave the first opening lecture highlighting the new hypertension guidelines. Since the American College of Cardiology (ACC) and AHA's new guidelines for the treatment of hypertension have been published a year ago, one of the meeting focuses was to discuss techniques and barriers to reaching these goals in patients.^{1–3} There was also a particular focus on patients with resistant hypertension, an ever-growing part of the population.⁴ The European,

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Australian, and Canadian guidelines were also highlighted during the meeting.

The clinical practice and clinical science track featured a highlight on aldosterone and its importance in hypertension. Additionally, the meeting presented primary care tracks in hypertension, to reach out to the primary care clinicians in the country who take care of the majority of hypertension. This meeting highlighted important basic science findings and other research currently “in the pipelines” that will change the way that we treat hypertension in the future. Integrated in these sessions is the new aim of the Council on Hypertension and KCVD in coordination with other AHA councils to achieve the 2020 impact goal of reducing cardiovascular diseases and stroke deaths among all Americans by 20%, while also improving the cardiovascular health of all Americans by 20%.

Stopping the Progression of Hypertension to Congestive Heart Failure

Dr Daniel Levy, a senior investigator at the National Institutes of Health, Heart Lung and Blood Institute, presented in the Advances in Hypertension session on preventing the progression from hypertension to heart failure. Dr Levy is the director of the Framingham Heart Study that was initiated in 1948 and now has 3 generations of patients who helped them coin the idea of risk factor in terms of cardiovascular disease.^{5,6} Furthermore, Dr Levy has been involved in the long-term monitoring and observation of the Framingham Heart Study patients over these many years. Not only is hypertension a risk factor for myocardial infarction, but it is also one of the cardinal risk factors for heart failure. Thus, understanding how important hypertension is as a risk factor provides insights into approaches to its prevention and treatment.

Sex Differences in Mechanisms of Hypertension Associated With Obesity

Dr Belin de Chantemele presented a current study investigating the mechanism whereby obesity leads to hypertension in both men and women, which is important given initiatives to explore sex differences in all aspects of basic science research. His research focused on sex differences and the role of leptin in contributing to the development of hypertension. When men and women are obese, leptin levels are increased. Using a mouse model, leptin was found to increase the sympathetic nervous system activation in males, yet it stimulates the production of aldosterone in female mice. His data suggest that those high aldosterone levels lead to endothelial dysfunction and contribute to the development of hypertension in obese female mice. Thus, he proposed a new

concept that obesity leads to hypertension via sex-specific mechanisms. Based on this, Dr Chantemele proposes to treat women with mineralocorticoid receptor inhibitors, which would block the action of aldosterone, an approach that may be more effective at reducing blood pressure in obese women.⁷

The Effect of Environmental Factors on Blood Pressure

Dr Robert Brook gave an interesting talk about his research, which investigates how environmental factors can affect blood pressure and how clinicians can incorporate this into their practice, first by being aware of the contribution of environmental factors to blood pressure. Besides lifestyle factors, such as increased dietary sodium and alcohol intake, other environmental factors can also affect blood pressure including temperature and altitude. However, there are other man-made factors such as noise, air pollutants, toxins in the environment, and natural disasters such as tsunamis, hurricanes, and forest fires, which all can have a major impact on blood pressure. These broad categories, all together or alone, are not commonly considered by many. Even more are not aware of the degree to which these factors can affect blood pressure, yet some can be addressed through prudent actions from a clinical standpoint. Therefore, it is important to raise awareness among patients and healthcare providers that altitude and temperature are also factors that affect blood pressure. Indeed, higher elevation and colder weather can increase blood pressure; clinicians and at-risk patients should monitor blood pressure more carefully during the winter as additional medications may be required control blood pressure during that time. Another frequently underconsidered environmental factor is increased exposure to noise. This blood pressure–increasing effect can be mitigated with the use of personal protection devices; however, what we do not know is whether that reduction of blood pressure is maintained over long periods of time, or if there is an actual reduction in cardiovascular events. The next step is to find out whether these interventions can have a persistent effect and translate into chronic verifiable health benefits.

Implementation of the New Hypertension Guidelines

Dr Brent Egan, the 2018 recipient of the Marvin Moser Award, presented the implementation of the new hypertension guidelines. According to Dr Egan, given that the new definition of hypertension includes systolic pressures starting at 130 versus 140 and diastolic at 80 versus 90 for most adults, there is a new challenge in translating guidelines into practices when this definition now includes over 100 million

individuals with hypertension. Dr Egan also emphasized that when it comes to hypertension in those individuals, most have other chronic health conditions. Thus, taking care of these patients and doing all that is needed to control blood pressure becomes quite challenging. By working with the American Medical Association and AHA on implementing target blood pressure or the “Measure Accurately, Act Rapidly, Partner with Patients” (MAP)⁸ protocol significantly improved hypertension control in underserved patients.

Strategically Focused Research Network

The AHA has committed 15 million dollars to devote to hypertension research in the strategically focused research network (SFRN). The 4 SFRN centers involved are as follows: University of Alabama at Birmingham, Cincinnati Children’s Hospital, Medical College of Wisconsin, and the University of Iowa. This network is now in its fourth year, and one of the center’s accomplishments of the Hypertension SFRN was highlighted during the joint meeting. Dr Mark Santillan from the University of Iowa and Dr Janet Catov from the Magee’s Women’s Hospital were awarded a collaborative grant this year focusing on a new project, a collaboration born out of the SFRN networks. Dr Santillan’s research was presented in the clinical track session, “The State of the Art on Management of Pregnancy-Associated Hypertension.”

Irvine Page Alva Bradley Lifetime Achievement Award

The Council on Hypertension awarded Dr Bill Cushman the 2018 Bradley Page Award Lifetime Achievement Award, one of the major awards given to an individual who has made a lifetime of outstanding research achievements in the field of hypertension. Dr Cushman has primarily been involved in large clinical trials, investigating the effect of either drugs or lifestyle factors on blood pressure. His focus in these studies was to test whether there are differences in drugs or perhaps different treatment goals that we should use. He has been involved since the late 1970s in clinical trials that are primarily sponsored either by the Department of Veterans Affairs (VA) or the National Heart, Lung, and Blood Institute. Some of these large studies were pivotal in determining the best selection of drugs, as well as blood pressure goals. Recently, Dr Cushman was involved in 2 trials investigating best targets for optimum blood pressure: the Action to Control Cardiovascular Risk in Diabetes trial,⁹ which included a blood pressure goal study comparing 120 to 140 mm Hg systolic as a goal, and then the SPRINT (Systolic Blood Pressure Intervention) trial,¹⁰ comparing a goal of <120 to <140 mm Hg. In particular, Dr Cushman observed in the

SPRINT trial a 25% to 30% decrease in both mortality and cardiovascular events with the lower blood pressure goal.¹¹

Memorial Lectures

The Arthur C. Corcoran Memorial Lecture was established in 1977 to honor Dr Arthur C. Corcoran for his early application of clearance methods in both hypertensive patients and animals. The 2018 lecture was presented this year by Virend K. Somers, MD of the Mayo Clinic College of Medicine in Rochester, Minnesota. The Lewis K. Dahl Memorial Lecture was established in 1988 by the Council for Hypertension in honor of Dr Dahl’s pioneering work on the relationship between salt, the kidney, and hypertension, and the establishment of a major genetically based experimental model of hypertension, the Dahl salt-sensitive rat. Dr Dominik N. Müller, PhD from the Experimental and Clinical Research Center in Berlin, Germany was honored as 2018 Lewis K. Dahl Memorial Lecturer by the AHA’s Council on Hypertension.⁵

The Harriet Dustan Award

To honor the memory of Dr Harriet Dustan, an outstanding clinician and investigator who was a tireless worker on behalf of the Council on Hypertension and the AHA for more than 50 years, The Harriet Dustan Award was established in 2008. This award recognizes female investigators who have made outstanding contributions in the field of hypertension. This year’s honoree was Dr Barbara T. Alexander, PhD of The University of Mississippi Medical Center in Jackson, Mississippi in recognition of her research focused on fetal programming and sex hormones in hypertension.

The Donald Seldin Lecture

The Donald Seldin Lecture honors Dr Donald Seldin, a pioneer and leader in the field of cardiovascular disease, as it relates to kidney failure. This lecture continues to raise awareness about the rising epidemic of cardiovascular disease and mortality in patients with chronic kidney disease. The 2018 lecture was presented by Paul A. Welling, MD from the University of Maryland School of Medicine in Baltimore, Maryland who has been a seminal force in developing our understanding of renal electrolyte balance and discussed insights into the with-no-lysine (WNK) pathway’s regulation of sodium transport.

Early Career–Focused Events and Mentorship

The AHA Council on Hypertension Trainee Advocacy Committee (TAC) was pleased to offer numerous programs for early-

career attendees, as well as several awards including the Stephanie Watts Career Development Award. In addition to celebrating our trainee's scientific success, every year the Council on hypertension Advocacy and mentoring program (CHAMP) promotes a mentor-mentee program during a networking lunch. During the lunch, we host a panel discussion presented by experts in the field featuring topics to help guide trainees on a clinical or basic science track in many aspects of their career. This mentorship program not only fosters networking and interaction between junior mentees and senior mentors but also facilitates professional growth of the mentee to achieve their goals. This year, the CHAMP featured a talk and panel discussion on "How to map your scientific independence during your postdoctoral training," followed by a networking lunch. The TAC has continued to have increased numbers in the poster presentation session, featuring 125 posters at the trainee on-site poster competition. The top 25 poster presentations received a travel award co-sponsored by the KCVD and International Society of Hypertension (ISH) New Investigator Committee (NIC). Also new for this year, the TAC introduced a booth during the poster presentations, to improve interactions between the trainees and their peers, and to increase awareness of a variety of opportunities such as memberships, career development activities, scientific independence, job opportunities, and funding opportunities across the world.

This year there were 6 finalists in the Hypertension Early Career Oral Awards session (3 basic and 3 clinical trainee abstracts) competing for the Early Career Award co-sponsored with the ISH NIC (Table). The finalists gave outstanding oral presentations, and the winner, Dr Andrew Tui, was announced at the Council Dinner Banquet. Dr Tui's study showed that the dopamine receptor, particularly the dopamine 1 receptor, may be responsible for at least 50% of renal sodium excretion, thus also regulating blood pressure. Last but not least, the popular TAC mixer is an annual event, co-sponsored by TAC, the AHA KCVD, and Data Sciences International along with generous donations from AHA members and attendees. This year's Trainee Mixer was a blast, creating memorable moments for attendees.

Awards Session

The awards session featured several presentations, including the Mid-Career Award for Research Excellence, the Harry Goldblatt Award for New Investigators, the British and Irish Hypertension Society Young Investigator Award, the High Blood Pressure Research Council of Australia Student Oral Award, and the Stephanie Watts Career Development Award Finalist Competition. The Mid-Career Award for Research Excellence recognizes a mid-career investigator active in hypertension or cardiovascular research. This year's winner,

Table. Hypertension Early Career Oral Award Session (Hypertension Early Career Award Competition)

Name	Abstract Title
Mohammad Saleem	Sox6 Has Protective Role during Renal Artery Stenosis Induced Hypertension
Daniela R. Dartora	Cardiac Mitochondria are Impaired After Transient Neonatal High Oxygen Exposure in a Rat Model of Prematurity-Related Condition
Andrew C. Tiu	Sorting Nexin 19: A Novel & Key Player in Renal Dopamine D1R Regulation
Edem Binka	Impact of New Clinical Practice Guidelines on Cardiovascular Disease Risk Assessment in an Obese Pediatric Population
Karla B. Neves	Endothelial-derived Microparticles as Biomarkers and Mediators of Endothelial Cell Injury in VEGF inhibitor-treated Cancer Patients: Implications in Hypertension
Antonio Giaimo	Hypertensive Urgency: An Emergency Department Pipeline to Primary Care Pilot Study

Sponsored by the Trainee Advocacy Committee of the Council on Hypertension, the British and Irish Hypertension Society, the Journal *Hypertension*, and the International Society of Hypertension's New Investigator Committee.

Jennifer C. Sullivan, PhD from the Medical College of Georgia at Augusta University in Augusta, Georgia, was selected for her outstanding contributions to the field of hypertension. Dr Sullivan presented an overview of some of her work investigating sexual differences between immune cell responses in females, a first in the field. The Harry Goldblatt New Investigator Award recognizes a new independent investigator working in hypertension or cardiovascular research who has significantly contributed to the understanding of the causes of hypertension and related cardiovascular disease. This year's winner was Dr Amy C. Arnold, PhD from Pennsylvania State University College of Medicine in Hershey, Pennsylvania. Dr Arnold's work focuses on how the brain controls blood pressure, with a focus on the mechanisms by angiotensin (1-7).

The British and Irish Hypertension Society (BISH) Young Investigator Award was presented to Luca Faconti of the King's College in London, England for his research focused on the Effects of Lower Limb Venous Occlusion on Cardiac Preload, Blood Pressure and Ventricular Function. The High Blood Pressure Research Council of Australia Award (HBPRCA) was presented to Ashenafi Haileyesus Betrie from the University of Melbourne in Victoria, Australia, whose research is focused on Zinc Ionophores as Novel Vasodilator Agents. These young investigator awardees from international hypertension societies were chosen, and then allowed to present their work at this year's AHA Hypertension meeting.

This year, the TAC, in collaboration with DSI, was proud to present the first ever Stephanie Watts Career Development Award. This award supports young investigators working in hypertension and cardiovascular research who show exceptional promise but may be currently unfunded or have limited access to extramural funding. The Stephanie Watts Career Development Award was established to honor the advocacy work of Dr Stephanie Watts, an active member of the Council on Hypertension who has always advocated for the needs of the many trainees associated with the council. The work of Dr Watts led to the creation of the TAC, which she also chaired from 2005 to 2007. As a founding member of the TAC, she contributed to the planning of the Hypertension Summer School, a previous council initiative that helped many trainees move towards becoming hypertension researchers. This year, the 3 finalists were selected from 13 applications. The finalists gave a short “elevator pitch” during the awards session, and the awardee received a quantitative blood pressure telemetry system from DSI to advance their hypertension research and obtain extramural funding using this technology. This year’s finalists were (1) Katrina M. Mirabito Colafella, PhD, (2) Nirupama Ramkumar, MD, MPH, and (3) winner Jennifer L. Sones, DVM, PhD. Dr Sones discussed her research “pitch”: “White Adipose Tissue in the Preeclamptic-like BPH/5 Mouse has a Unique Molecular Signature during Early Pregnancy.”

Excellence in Hypertension Research Awards and Annual Hypertension Scientific Sessions Awards Banquet

The Excellence in Hypertension Research Award lectures were presented by 2 outstanding scientists in recognition of their contributions to the field of hypertension and cardiovascular disease. The awardees, Drs R. Clinton Webb and Paul K. Whelton, were recognized during the annual Hypertension Banquet. Dr Webb, the Herbert S. Kupperman Chair in Cardiovascular Disease in the Department of Physiology at the Medical College of Georgia at Augusta University, received this excellence award for hypertension research for his lasting contributions to the understanding of vascular smooth muscle contractility and endothelial function during hypertension. Dr Whelton, Clinical Professor Show Chwan Health System and Endowed Chair in Global Public Health at Tulane University’s School of Public Health and Tropical Medicine, presented his Excellence in Hypertension Research Award lecture on “Clinical Trials and Practice Guidelines: Evidence-Based Progress in Lowering Blood Pressure.”

Conclusions

This year, the 2018 joint meeting was a combined outstanding effort of the AHA’s Council on Hypertension and KCVD,

together with ASH to organize one of the best meetings in the cardiovascular field for attendees from all over the world. For more information on program sessions, please visit the following: https://professional.heart.org/idc/groups/ahamah-public/@wcm/@sop/@scon/documents/downloadable/ucm_502345.pdf. We look forward to another successful meeting next year on September 5th to 8th, 2019 in New Orleans, Louisiana.

Disclosures

None.

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