Hypertension CANADA

2012 CANADIAN HYPERTENSION CONGRESS

Global Atherosclerosis Risk Reduction: Hypertension and Beyond

Thursday, October 25 to Sunday, October 28, 2012
Sheraton Centre, Toronto, Ontario



Hypertension CANADA

2012 CANADIAN HYPERTENSION CONGRESS

Global Atherosclerosis Risk Reduction: Hypertension and Beyond

The 2012 Canadian Hypertension Congress Organizing Committee gratefully acknowledges the following sponsors for their generous contribution and their continued commitment to the hypertension community.

Platinum Sponsors

Abbott
A Promise for Life

Boehringer Ingelheim

SERVIER

Gold Sponsors

Forest Laboratories Canada Inc.

MERCK

Takeda

Silver Sponsors

Medtronic

Pfizer
Working together for a healthier world™

2012 CANADIAN HYPERTENSION CONGRESS

Hypertension Canada is pleased to welcome you to the second annual ***Canadian Hypertension Congress – Global Atherosclerosis Risk Reduction: Hypertension and Beyond.***

Three streams of programming are offered daily to meet the educational needs of health care professionals and of scientists from across all four research pillars. Our congress goal is to promote the development and exchange of evidence-based information on the pathobiology and management of hypertension and related cardiovascular diseases.

The congress also marks the third anniversary of the integration of CHEP, BP Canada and the Canadian Hypertension Society and our on-going development into a leading Canadian non-profit charitable organization focused on the prevention of hypertension and hypertension-related disease. We celebrate the growing impact of the organization:

- In the development of new, innovative professional education programs
- In our expanding educational resources for the public and for patients with hypertension
- In the improved electronic communication systems we have developed, providing immediate access to our knowledge translation materials through our new, improved website

We remain very proud of our CHEP recommendations process- the signature program of Hypertension Canada. 2013 will be the fourteenth year that the Canadian Hypertension Education Program (CHEP) has annually updated recommendations for the management of hypertension. Surveillance data has indicated tremendous success in the awareness, prevention and control of hypertension and hypertension-related complications in Canada. The 2013 CHEP Recommendations will be available on the website early in the new year.

These efforts represent the work of hundreds of our members and volunteers- our most important resource! We are all truly grateful for their commitment to the work of Hypertension Canada.

We welcome all participants of the 2012 Canadian Hypertension Congress and are excited to offer this opportunity to network with scientists and health care professionals who share a strong commitment to the prevention and control of hypertension and its associated risk factors.

Sincerely,

Ross Feldman, MD
Course Director and Congress Chair
2012 Canadian Hypertension Congress
President, Board of Directors
Hypertension Canada

Judi Farrell
Chief Executive Officer
Hypertension Canada

Thank you to the 2012 Canadian Hypertension Congress Scientific Program Committee

Ross Feldman, MD
Course Director and Congress Chair
RW Gunton Professor of Therapeutics
Departments of Medicine and of Physiology & Pharmacology
Western University
London, Ontario

Robert Gros, PhD
Chair, Scientific Program
Assistant Professor and Scientist
Departments of Medicine, Physiology and Pharmacology
Robarts Research, Institute, Western University
London, Ontario

Oliver Baclic, MD, MSc
Medical Advisor
Centre for Chronic Disease Prevention and Control
Public Health Agency of Canada
Ottawa, Ontario

Sandra T. Davidge, PhD
Director, Women and Children's Health Research Institute
Professor, Departments of Ob/Gyn and Physiology
Canada Research Chair (Tier 1) in Women's Cardiovascular Health
University of Alberta
Edmonton, Alberta

Frans HH Leenen, MD, PhD
Professor of Medicine & Pharmacology
University of Ottawa
Director, Hypertension Unit
University of Ottawa Heart Institute
Ottawa, Ontario

Richard Lewanczuk, MD, PhD
Professor, Department of Medicine
University of Alberta
Senior Medical Director
Primary and Community Care
Alberta Health Services
Edmonton, Alberta

Martin Myers, MD
Professor, University of Toronto
Cardiologist
Sunnybrook Health Sciences Centre
Toronto, Ontario

Robert J Petrella, MD, PhD
Beryl and Richard Ivey Research Chair
Lawson Health Research Institute
Professor of Family Medicine, Rehabilitation, Kinesiology and Cardiology
Western University
London, Ontario

Timothy L. Reudelhuber, PhD
Director, Laboratory of Molecular Biochemistry of Hypertension
Executive Director, Academic Affairs
Institut de recherches cliniques de Montréal (IRCM)
Montreal, Quebec

Ernesto Schiffrin, MD, CM, PhD
Professor and Vice-Chair (Research)
Department of Medicine, McGill UniversityPhysician-in-Chief
Sir Mortimer B. Davis-Jewish General Hospital
Canada Research Chair in Hypertension and Vascular Research
Lady Davis Institute for Medical Research
President of the International Society of Hypertension
Montreal, Quebec

Johanne Tremblay, PhD
Professor of Medicine
University of Montreal
Director, Cardiometabolic Axis
Director, Laboratory of Cellular Biology of Hypertension
Montreal, Quebec

Hypertension Canada Board of Directors (2011-2012)

Ross Feldman, MD
President
RW Gunton Professor of Therapeutics
Departments of Medicine and of Physiology & Pharmacology
Western University
London, Ontario

Pierre Larochelle, MD, PhD
Vice President
Professor, Department of Pharmacology, Faculty of Medicine
University of Montréal
Emeritus Professor
Institut de recherches cliniques de Montréal (IRCM)
Montreal, Quebec

Robert Brooks, MBA
Treasurer
Vice Chairman and Group Treasurer (Retired)
Bank of Nova Scotia
Oakville, Ontario

Barry Arbus, Q.C.
Senior Partner
Torkin Manes Barristers & Solicitors
Toronto, Ontario

Heather Arthur, MScN, PhD
Chief Scientific Officer
Hamilton Health Sciences Corporation
McMaster University, School of Nursing
Hamilton, Ontario

Lyne Cloutier, RN, PhD
Professor of Nursing
Research Scholars FRQS-FRESIQ (Junior 1)
Université du Québec à Trois-Rivières
Trois-Rivières, Quebec

Brenda Hemmelgarn, MD, PhD
Associate Professor
Departments of Medicine and Community Health Sciences
University of Calgary
Roy and Vi Baay Chair in Kidney Research
Director, Alberta Kidney Disease Network (AKDN)
Chair, Canadian Society of Nephrology Clinical Practice Guidelines
Calgary, Alberta

Mansoor Husain, MD, FRCPC
Professor, Department of Medicine
Director, Heart and Stroke Richard Lewar Centre for Excellence
University of Toronto
Director & Senior Scientist
Toronto General Hospital Research Institute
Toronto, Ontario

Kori Kingsbury, MSN
Chief Executive Officer
Cardiac Care Network of Ontario
Toronto, Ontario

Ernesto Schiffrin, MD, CM, PhD
Professor and Vice-Chair (Research)
Department of Medicine, McGill UniversityPhysician-in-Chief
Sir Mortimer B. Davis-Jewish General Hospital
Canada Research Chair in Hypertension and Vascular Research
Lady Davis Institute for Medical Research
President of the International Society of Hypertension
Montreal, Quebec

Laura Syron
Vice President, Community Programs
Princess Margaret Hospital Foundation
Toronto, Ontario

Ross Tsuyuki, PharmD, MSc
Faculty of Medicine and Dentistry
Faculty of Pharmacy and Pharmaceutical Sciences
Director, EPICORE Centre
University of Alberta
Edmonton, Alberta

HYPERTENSION CANADA - WHO WE ARE

Mission

Hypertension Canada is a volunteer-based, not-for-profit organization advancing health through the prevention and control of high blood pressure and its complications.

Values

Six values guide our work:

- Evidence-based decision making
- Innovation
- Multidisciplinary, multisectorial collaboration
- Transparency
- Volunteer leadership
- Respect and teamwork

Background

Hypertension Canada represents over 50 years of expertise in the field of hypertension.

In order to bring about positive benefits for the millions of people in Canada who deal on a daily basis with the dangers and harmful effects of hypertension, Hypertension Canada is working hard to:

- create ONE authoritative, more efficient and effective voice on hypertension
- ensure synergistic interactions across all pillars of research and scholarship
- translate and mobilize the knowledge necessary to control, manage and prevent high blood pressure in Canada

HYPERTENSION CANADA - WHAT WE DO

The Hypertension Canada organizational structure brings together efforts and provides liaison in four major program areas, all providing vehicles for knowledge mobilization:

- Hypertension Canada's Canadian Hypertension Education Program (CHEP)
- Research and Training
- Public Policy and Advocacy
- Communications and Congress

Hypertension Canada's Canadian Hypertension Education Program (CHEP)

CHEP is our knowledge translation program targeting various healthcare providers in clinical and community settings, providing annually updated recommendations to diagnose, treat and control hypertension. The program includes development of the recommendations (by a multidisciplinary committee from the hypertension community), dissemination (both printed and electronic) and evaluation. The annual evidence-based recommendations are developed through intense discussion of the clinical implications via a systematic review of the literature followed by critical appraisals of all the new clinical research. The CHEP recommendations for healthcare providers are then translated and adapted into educational materials for patients and providers, as well as Continuing Medical Education/Continuing Professional Development programs. The public recommendations are published in lay and healthcare professional journals and available for distribution to medical offices, hospitals, clinics, pharmacies, education centres and via a free mobile application.

Visit **www.hypertension.ca** for more information.

Research & Training

Hypertension Canada will continue to support and promote clinical and basic research through the following:

- Encouraging and co-ordinating basic and clinical research on hypertension in Canada
- Developing and implementing an integrated national hypertension research agenda across all four CIHR pillars – from molecules to populations.

Supporting the development of young basic and clinical scientists in the field of hypertension research is a priority for Hypertension Canada and includes activities to:

- Increase our funding of future trainees and investigators with potential partnerships with CIHR, corporations and voluntary health organizations
- Reinvigorate clinical science and involve health systems and population science researchers/trainees
- Encourage career mentoring and succession planning

Provide a forum for the presentation of hypertension research in Canada

Public Policy & Advocacy

The Public Policy Program of Hypertension Canada wishes to promote the implementation of healthy public and health services policies that will lead to enhanced prevention and control of hypertension, and to promote the development of community resources and programs that support the prevention and control of hypertension.

The Public Policy Committee includes the following committees:

- Healthy Public Policy
- Community Capacity Building
- Health Systems

Public Policy objectives include:

- The promotion of prevention and control of high blood pressure
- Efforts related to sustaining the Canadian Chair in Hypertension Prevention and Control
- Supporting efforts directed at sodium reduction and healthy lifestyle choices

Communications and Congress

Hypertension Canada continues its commitment to knowledge mobilization through:

- Our Membership Program (Individual and Corporate)
- Our Website
- Our monthly electronic newsletter, eINFO
- The Canadian Hypertension Congress

HYPERTENSION CANADA - A CULTURE OF PARTNERSHIPS

Hypertension Canada operates in a culture of partnership, reaching out to members, leaders, scientists, primary caregivers, specialists, nurses, pharmacists, dietitians, government, other non-government organizations, industry and the public.

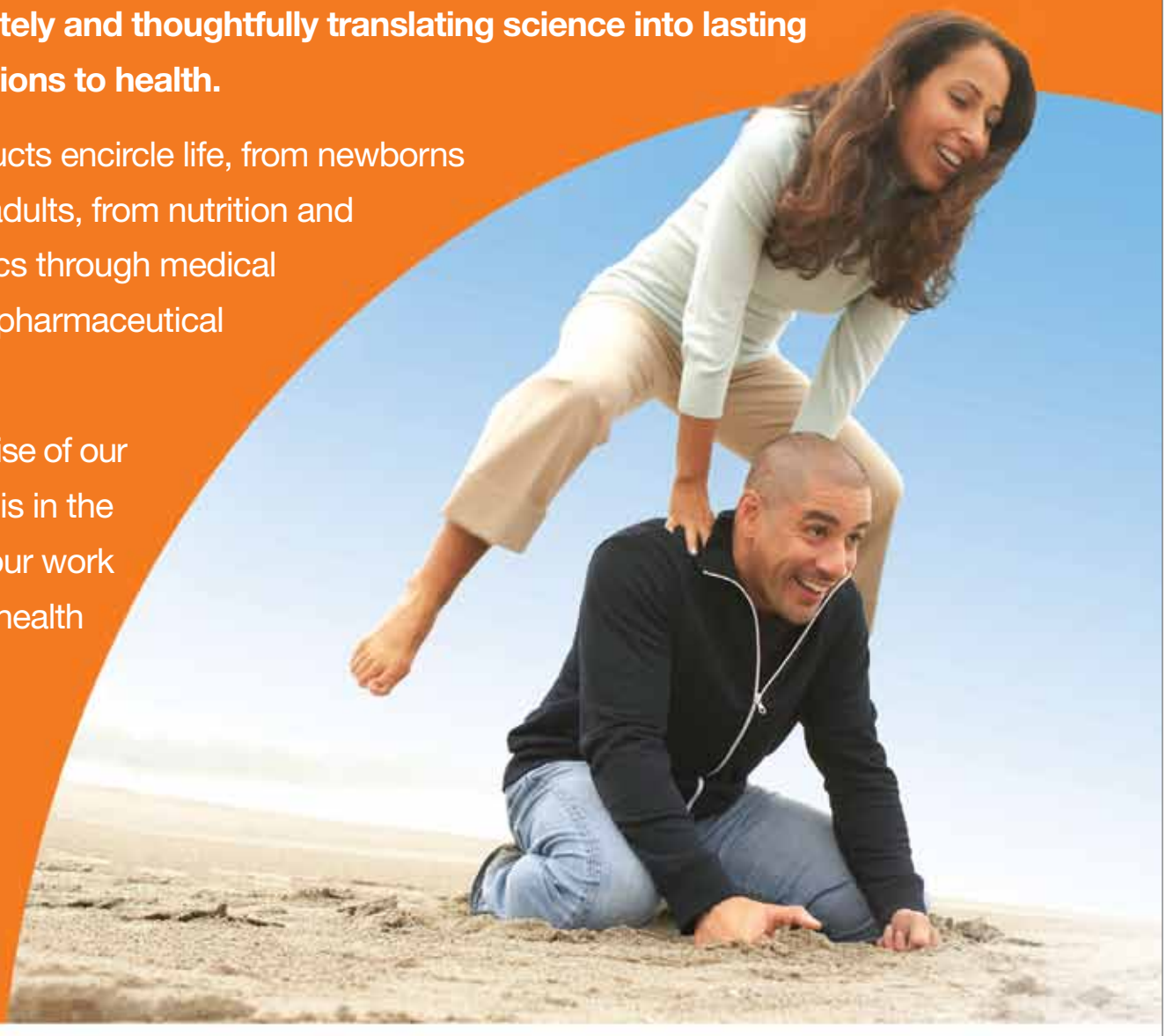
Collaboration with an extensive partnership network is essential to achieving our mission. Only through partnership and mobilization of health knowledge will we achieve significant advances in the management, prevention and control of hypertension to improve the health of the people of Canada.

Our Promise for Life

We are here for the people we serve in their pursuit of healthy lives. This has been the way of Abbott for more than a century – **passionately and thoughtfully translating science into lasting contributions to health.**

Our products encircle life, from newborns to aging adults, from nutrition and diagnostics through medical care and pharmaceutical therapy…

The promise of our company is in the promise our work holds for health and life.



www.abbott.ca

Abbott
A Promise for Life

Join Hypertension Canada at the *Industry Central*

Meet our supporters at an interactive cocktail reception

Provincial Ballroom, Sheraton Centre
Saturday, October 27, 2012
5:00 p.m. to 7:00 p.m.

Industry Partners

Hypertension CANADA | 2012 CANADIAN HYPERTENSION CONGRESS

Platinum Sponsors

Abbott
A Promise for Life

Boehringer Ingelheim

SERVIER

Gold Sponsors

Forest Laboratories Canada Inc.

MERCK

Takeda

Silver Sponsors

Medtronic

Pfizer
Working together for a healthier world™

LEARNING OBJECTIVES

The purpose of the Canadian Hypertension Congress (CHC) is to encourage and promote the development, advancement and exchange of balanced and evidence-based information regarding the research, diagnosis and treatment of hypertension and related cardiovascular diseases towards the ultimate goal of improved patient care and health.

The scientific sessions are designed to:

- Present and examine new findings on the physiology, pathophysiology, epidemiology, diagnosis and management of hypertension, atherosclerosis and related diseases
- Review current state-of-the-art advances in managing particular groups of patients
- Evaluate specific treatment modalities and pharmacological agents

By attending the Canadian Hypertension Congress, participants will be able to:

- Familiarize themselves with exemplary collaborative clinical and research initiatives in the area of cardiovascular disease prevention
- Integrate their knowledge of information derived from current Canadian cardiovascular research into their practice
- Foster discussion and debates that encourage innovation in cardiovascular health and research

ACCREDITATION

This event is an Accredited Group Learning Activity (Section 1) as defined by the Maintenance of Certification program of The Royal College of Physicians and Surgeons of Canada and approved by Continuing Professional Development, Schulich School of Medicine & Dentistry, Western University (21.75 hours).

This program meets the accreditation criteria of the College of Family Physicians of Canada and has been accredited by Continuing Professional Development, Schulich School of Medicine & Dentistry, Western University for up to 21.75 Mainpro-M1 credits.

Each participant should claim only those hours of credit that he/she actually spent participating in the educational program.

CONFLICT OF INTEREST DISCLOSURE

Hypertension Canada strives to ensure balance, independence, objectivity, and scientific rigor in all of its educational programs. All faculty members participating in this program have been required to disclose any real or apparent conflict(s) of interest that may have a direct bearing on the subject matter of the session in which they are participating. This includes relationships in place at the time of the meeting or in the twelve (12) months preceding the meeting, with pharmaceutical companies, biomedical device manufacturers, or other corporations whose products or services are related to the subject matter of the presentation topic. The intent of the policy is to identify openly any conflict of interest so that the listeners may form their own judgments about the presentations with the full disclosure of the facts.

Malcolm Arnold, MB, MD
Professor of Medicine, Physiology and Pharmacology
Research Director, Division of Cardiology
Western University
Program Leader, Circulation Group,
Lawson Health Research Institute
Chair, Canadian Heart Failure Network
Staff Cardiologist, London Health Sciences Centre
London, Ontario

Richard Birtwhistle, MD, MSc
Professor of Family Medicine, Community Health and Epidemiology
Director, Centre for Studies in Primary Care
Queen's University
Kingston, Ontario

Steffen-Sebastian Bolz, MD, PhD
Associate Professor
Department of Physiology
University of Toronto
Heart & Stroke Richard Lewar Centre of Excellence in Cardiovascular Research
Toronto, Ontario

Gerald Brock, MD
Professor of Surgery
Urology Program Director
Western University
Chair, Office of Education
Canadian Urology Association
London, Ontario

Norm Campbell, MD
Professor of Medicine
Community Health Sciences, Physiology and Pharmacology
Libin Cardiovascular Institute of Alberta
University of Calgary
Calgary, Alberta

Tavis Campbell, PhD
Associate Professor
University of Calgary
Associate Editor
Journal of Behavioral Medicine
Head, Health Section
Canadian Psychological Association
Chair, Adherence Subcommittee
Canadian Hypertension Education Program
Calgary, Alberta

Stella S. Daskalopoulou, MD, MSc, PhD
Assistant Professor in Medicine
Department of Medicine
Division of Internal Medicine
McGill University
Montreal General Hospital
Montreal, Quebec

Sandra T. Davidge, PhD
Director, Women and Children's Health Research Institute
Professor, Departments of Ob/Gyn and Physiology
Canada Research Chair (Tier 1) in Women's Cardiovascular Health
Alberta Heritage Foundation for Medical Research Scientist
University of Alberta
Edmonton, Alberta

Paul Dorian, MD, MSc
Professor of Medicine
Director, Division of Cardiology
University of Toronto
Cardiac Electrophysiologist
St. Michael's Hospital
Toronto, Ontario

George Dresser, MD, PhD
Associate Professor, Division of Clinical Pharmacology
Western University
London Health Sciences Centre
London, Ontario

Denis Drouin, MD
Clinical Professor of Family Medicine and Emergency Medicine
Associate Director, Continuing Medical Education Office
Laval University School of Medicine
Primary Care Physician and Medical Director
Centre médical LeMesnil, Complexe de santé de la capitale
Quebec, Quebec

Ross Feldman, MD
RW Gunton Professor of Therapeutics
Departments of Medicine and of Physiology & Pharmacology
Western University
London, Ontario

Mark Gelfer, MD
Clinical Assistant Professor, Department of Family Practice
University of British Columbia
Vancouver, British Columbia

Robert Gros, PhD
Assistant Professor and Scientist
Departments of Medicine, Physiology and Pharmacology
Robarts Research, Institute, Western University
London, Ontario

Amir Hanna, MB
Professor Emeritus, Department of Medicine
University of Toronto
Director, Diabetes Clinics
St. Michael's Hospital
Toronto, Ontario

Robert A. Hegele, MD
Jacob J. Wolfe Distinguished Medical Research Chair
Edith Schulich Vinet Canada Research Chair (Tier 1) in Human Genetics
Martha Blackburn Chair in Cardiovascular Research
Distinguished University Professor of Medicine and Biochemistry
Western University
London, Ontario

Brenda Hemmelgarn, MD, MSc, PhD
Associate Professor
Departments of Medicine and Community Health Sciences
University of Calgary
Roy and Vi Baay Chair in Kidney Research
Director, Alberta Kidney Disease Network (AKDN)
Chair, Canadian Society of Nephrology Clinical Practice Guidelines
Calgary, Alberta

Robert Herman, MD
Head, Division of General Internal Medicine
University of Calgary
Scientific Advisory Committee, Bioavailability and Bioequivalence
Scientific Advisory Panel, Bioequivalence Requirements for Modified
Release Dosage Form
Health Canada
Calgary, Alberta

Sanda Islik, BSN, RN
Manager Service Integration
Copeman Healthcare Centre
Vancouver, British Columbia

Janusz Kaczorowski, PhD
Professor and Research Director
Department of Family and Emergency Medicine
University of Montreal
University of Montreal Hospital Research Centre (CRCHUM)
Doctor Sadok Besrour Endowed Chair in Family Medicine
GSK-CIHR (GlaxoSmithKline-Canadian Institutes of Health Research)
Endowed Chair in Optimal Management of Chronic Disease
Montreal, Quebec

Lorrie A. Kirshenbaum, PhD
Director of Research Development, Faculty of Medicine
Professor, Departments of Physiology and Pharmacology & Therapeutics
University of Manitoba
Canada Research Chair in Molecular Cardiology
Institute of Cardiovascular Sciences
St. Boniface General Hospital Research Centre
Winnipeg, Manitoba

Katie Lafferty
Executive Director
Canadian Stroke Network
Ottawa, Ontario

Pierre Larochelle, MD, PhD
Professor, Department of Pharmacology, Faculty of Medicine
University of Montréal
Emeritus Professor
Institut de recherches cliniques de Montréal (IRCM)
Montreal, Quebec

Frans HH Leenen, MD, PhD
Professor of Medicine & Pharmacology
University of Ottawa
Director, Hypertension Unit
University of Ottawa Heart Institute
Ottawa, Ontario

Finlay McAlister, MD, MSc
Professor, Division of General Internal Medicine
University of Alberta Hospital
AIHS Senior Health Scholar
Edmonton, Alberta

Donald McKay, MS, PhD
Associate Dean, Undergraduate Medical Education
Professor of Physiology, Division of BioMedical Sciences
Faculty of Medicine
Memorial University of Newfoundland
St. John's, Newfoundland and Labrador

Raj Padwal, MD
Clinical Pharmacology and General Internal Medicine
Director, Hypertension Clinic
University of Alberta
Edmonton, Alberta

Geoffrey Pickering, MD, PhD
Heart and Stroke Foundation / Barnett-Ivey Chair
Professor, Departments of Medicine, Biochemistry, and Medical Biophysics
Robarts Research Institute
Western University
London, Ontario

Andrew Pipe, CM, MD, LLD(Hon), DSc(Hon)
Professor, Faculty of Medicine
University of Ottawa
Chief, Division of Prevention and Rehabilitation
University of Ottawa Heart Institute
Ottawa, Ontario

Luc Poirier, MSc
Pharmacist
Hypertension Clinic and Pharmacy Department
CHU de Québec - CHUL
Quebec, Quebec

Neil R Poulter, FMed Sci, MBBS, MSc
Professor of Preventive Cardiovascular Medicine
National Heart & Lung Institute
Imperial College
London, United Kingdom

Mark J. Poznansky, PhD, O.Ont, CM
President and CEO
Ontario Genomics Institute
Toronto, Ontario

Rob Quinn, MD, PhD
Assistant Professor
Departments of Medicine / Community Health Sciences
University of Calgary
Nephrologist
Foothills Medical Centre
Calgary, Alberta

Debra Reid, PhD, RD, *representing Dietitians of Canada*
National Manager STF, Health Promotion Program
CF Health Services HQ
Department of National Defence
Ottawa, Ontario

Jean L. Rouleau, MD
Scientic Director, ICRH (CIHR)
Professor of Medicine
University of Montréal
Staff Cardiologist
Montreal Heart Institute
Montreal, Quebec

Marcel Ruzicka, MD, PhD
Associate Professor of Medicine
Division of Nephrology
University of Ottawa
Ottawa, Ontario

Duncan J. Stewart, MD
Professor, Faculty of Medicine
University of Ottawa
CEO & Scientific Director
Ottawa Hospital Research Institute
Vice President, Research
The Ottawa Hospital
Ottawa, Ontario

Sheldon Tobe, MD
Associate Professor, Division of Nephrology
University of Toronto
Associate Scientist
Schulich Heart Research Program
Sunnybrook Research Institute
Associate Scientist, Institute of Medical Science (IMS)
Toronto, Ontario

Luc Trudeau, MD
Assistant Professor, Division of Internal Medicine
Cardiovascular Prevention Centre
Jewish General Hospital
Montreal, Quebec

Rui Wang, MD, PhD
Vice President (Research, Economic Development and Innovation)
Lakehead University
Thunder Bay, Ontario

Scientific Program

Thursday, October 25, 2012			Room
4:00 p.m. – 4:05 p.m.	**Opening Remarks** – *Ross Feldman*		Provincial Ballroom
4:05 p.m. – 4:35 p.m.	Keynote Address | **The Nature Versus Nurture Basis of Atherosclerotic Risk Factors** *Robert Hegele*		
4:35 p.m. – 6:00 p.m.	**Welcome Reception**		Provincial Ballroom
	Biomedical Research Track	**Poster Session I** *Note: Poster presentations will take place from 5:00 to 6:00 p.m.* Poster #1 | In Vitro Nischarin Overexpression Opposes Cell Death Induced By Oxidative Stress – *Henry Aceros* Poster #2 | Role of Protein Kinase C Delta in Enhanced Expression of Gq Protein and Vascular Smooth Muscle Cells Hypertrophy in Spontaneously Hypertensive Rats – *Mohammed Emehdi Atef* Poster #3 | Exercise Reduced Erythropoietin-Induced Hypertension and Vascular Injury in Mice Overexpressing Human Endothelin-1 – *Tlili Barhoumi* Poster #4 | Reduced Macrophage-Dependent Inflammation Prevents Endothelin-1 Vascular Detrimental Effects – *Tlili Barhoumi* Poster #5 | Effects of Endothelial Microparticles on Endothelial Cell Signaling in Vitro and Endothelium Function in Isolated Mesenteric Arteries – *Dylan Burger* Poster #6 | Podocyte Microparticle Formation is Increased Following Glomerular Injury – *Dylan Burger* Poster #7 | Altered C-Src Activity by Aldosterone in Vascular Smooth Muscle Cells from SHR Involves PDGFR, C-Terminal Src Kinase (CSK) and CSK-Binding Protein (CBP) – *Glaucia Callera* Poster #8 | Modularization Effectuates Homeostatic Design Organizing Blood Pressure Quantitative Trait Loci – *Kimberley Crespo* Poster #9 | The Effects of Estrogen in Rat Vascular Endothelial Cells are not Dependent on GPER – *Qingming Ding* Poster #10 | Implication of the Renin-Angiotensin System and Angiogenic Balance in the Effects of Exercise Training in an Animal Model of Preeclampsia Superimposed on Chronic Hypertension – *Dominque S. Genest* Poster #11 | Cytoprotective Signaling in Oxytocin-Induced Cardioprotection From Ischemia - Reperfusion – *Araceli Gonzalez Reyes*	Provincial Ballroom Foyer

Friday, October 26, 2012			Room
7:00 a.m. – 8:00 a.m.	Biomedical Research Track	**Workshop |** Using Micro-Fluid Chip-Based Technology to Assess Vascular Function – *Steffen-Sebastian Bolz*	Elgin
		Workshop | The Regulation of Angiogenesis – *Geoff Pickering*	Wentworth
8:00 a.m. – 9:30 a.m.	Biomedical Research Track	**Co-Chairs:** Sandra Davidge & Julie Lavoie **8:00 State of the Art |** Fetal Programming and Potential Therapeutic Interventions – *Sandra Davidge* **8:30** Effects of (Pro)renin Receptor Blockade on Glucose Metabolism in Mice on High Fat, High Carbohydrate Diet – *Zulaykho Shamansurova* **8:45** Regulation of Smooth Muscle Cell Socialization by TGF-ß and OB-Cadherin – *Brittany Balint* **9:00** Multipotent Mesoderm-Derived Stem Cells of the Aorta Form Vascular Smooth Muscle Cells – *Sarah Steinbach* **9:15** The Functional Significance of an Intrinsic Cholinergic System in Murine Cardiomyocytes – *Ashbeel Roy*	Dominion North
	Clinical/Outcomes/ Population Research Track	**Co-Chairs:** Stella Daskalopoulou & Simon Rabkin **8:00 State of the Art |** Arterial Stiffness: Cause and Effect of Hypertension – *Stella Daskalopoulou* **8:30** Aortic Blood Pressure of Hypertensive Men During Short-Term Cold Exposure – *Heidi Hintsala* **8:45** Brachial-Ankle Pulse Wave Velocity is the Index of Arterial Stiffness That Most Closely Correlates With Mitral Valve Indices of Diastolic Dysfunction – *Simon Rabkin* **9:00** How Does the Organization of Community Based Networks Foster Improvements in Health and System Outcomes? – *Beatrice McDonough* **9:15** Epidemiological, Clinical, and Evolutionary Characteristics of Resistant Hypertension of the African Black Subject – *Yameogo Nobila Valentin*	Dominion South
	Core Curriculum Track*	**Co-Chairs:** Raj Padwal & Luc Trudeau **8:00** Global CV Risk Management: Module 2 – *Denis Drouin* **8:30** Benefits of Lifestyle Change on Hypertension: Module 3 – *Luc Trudeau* **9:00** Salt Reduction: A Cost-Effective Public Health Measure – *Norm Campbell*	City Hall

*Primary Prevention Core Curriculum Track presented in association with Heart and Stroke Foundation, Ontario

10:00 a.m. – 11:30 a.m.	Biomedical Research Track	**Co-Chairs:** Johanna Hannah & Dylan Burger **10:00** A Novel C-Terminal ACE Inhibitor Reduces Angiotensin-Dependent Hypertension in Mice – *Dylan Burger* **10:15** T Regulatory Lymphocytes Counteract Angiotensin II-Induced Vascular Remodeling – *Muhammad Oneeb Rehman Mian* **10:30** Defective C-Myb Activity in Bone Marrow-Derived Cells Causes Decreased Aortic Systolic Blood Pressure – *Eric Shikatani* **10:45** Role of Sphingosine-1-Phosphate Signalling in Human Resistance Artery Function – *Sonya Hui* **11:00** State of the Art | Sodium-Induced Hypertension – *Frans Leenen*	Dominion North
	Clinical/Outcomes/ Population Research Track	**Co-Chairs:** Raphael Bahati & Raj Padwal **10:00** Reproducibility of Masked Hypertension – *Alain Milot* **10:15** A Systematic Review of Web-Based Interventions in Reducing Blood Pressure – *Sam Liu* **10:30** The HARMONY Study : Secondary Results From a Randomized Controlled Trial – *Kimberly Blom* **10:45** Development and Validation of a Public Health Questionnaire to Better Understand Barriers and Facilitators of Adherence to Medication and Lifestyle – *Raphael Bahati* **11:00** State of the Art | Developing the Link between Obesity and Cardiovascular Risk – *Raj Padwal*	Dominion South
	Core Curriculum Track*	**Co-Chairs:** Tavis Campbell & Denis Drouin **10:00** Smoking Cessation Therapy Update – *Andrew Pipe* **10:30** Non-Compliance and Adherence Strategies – *Tavis Campbell* **11:00** Managing CV Risk in Patients with Diabetes – *Pierre Larochelle*	City Hall
11:30 a.m. – 2:00 p.m.	Biomedical Research Track	**Poster Session II** *Note: Poster presentations will take place from 1:00 to 2:00 p.m.* Poster #12 | Endothelin-1 Expression In Young and Old Rat Aorta – *Huy Nguyen* Poster #13 | Endothelin-1-Induced Oxidative Stress and Inflammatory Cell Infiltration Contribute to High-Fat Diet Induced-Atherosclerosis in Apolipoprotein E Knockout Mice – *Pierre Paradis* Poster #14 | Aldosterone-Induced Small Artery Endothelial Dysfunction, Inflammation and Oxidative Stress are Blunted in Angiotensin Type 1a Receptor Knockout Mice – *Pierre Paradis* Poster #15 | Placental Growth Factor Deletion Alters Uterine Angiogenesis During Early Pregnancy in Mice – *Matthew Rätsep* Poster #16 | Transglutaminase 2 is a Regulator of Angiotensin II-Induced ERK1/2 Activation in Vascular Smooth Muscle Cells – *Yohann Rautureau* Poster #17 | Mapping of Chromosome 2 Regions Linked to Vascular Inflammation Using Congenic Rats – *Asia Rehman* Poster #18 |The Role of Adipose Tissue (Pro)Renin Receptor Expression in Glucose Homeostasis – *Zulaykho Shamansurova* Poster #19 | Susceptibility to Vascular Calcification Differs by Region: Role for Phosphate, Magnesium and Vitamin D – *Navid Shobeiri* Poster #20 | Potential Implication of Adipokines in (Pro)Renin/Renin Receptor Blocker Effects on Weight Gain – *Paul Tan* Poster #21 | Effect of High Salt Feeding on Renal Blood Flow Autoregulation and Pathology in the Spontaneously Hypertensive Rat – *Victoria Yum*	Provincial Ballroom Foyer

*Primary Prevention Core Curriculum Track presented in association with Heart and Stroke Foundation, Ontario

2:00 p.m. – 4:00 p.m.	Public Health Plenary | **Models for Improvement of Blood Pressure by Lifestyle Modification: From Sea to Sea to Sea-Salt (Reduction)** **Co-Chairs:** Norm Campbell & Heather Arthur **Faculty:** Norm Campbell, Janusz Kaczorowski and Andrew Pipe **Description:** Comparison and discussion of the various public health, primary care and community-based approaches for the improvement of blood pressure by lifestyle modification Public Health Approaches – *Norm Campbell* Community-Based Approaches – *Janusz Kaczorowski* Primary Care Team Approaches – *Andrew Pipe*		Dominion Ballroom
	Core Curriculum Track*	**Co-Chairs:** George Dresser & Luc Poirier **2:00** The Ups and Downs of BP Targets in CKD: What is the Target? – *Marcel Ruzicka* **2:30** Single Pill Multiple-Mechanism Combination Therapies – *George Dresser* **3:00** Resistant Hypertension: What Is It and How to Treat It – *Robert Herman* **3:30** Hypoglycemics Update – *Amir Hanna*	City Hall
4:00 p.m. – 5:30 p.m.	**Lifestyle Change "Inertia"- Motivational Tools for Change and Adherence** **Moderator:** Debra Reid **Workshop Facilitators:** Mark Gelfer and Sanda Islik **Description:** This hands-on workshop will provide the audience with an opportunity to fine-tune their practice and learn more about the tools available to engage patients in making changes in the management of their overall health, and hypertension in particular. The session will explore the elements of the gap between knowledge and action, and will present some case studies, highlight the coaching tools that facilitate action, and conclude with a take-home summary of the most important tools. **Learning Objectives:** 1. Increase clinical awareness about lifestyle change "inertia" 2. Provide an overview of coaching research and utilization of coaching in medicine 3. Familiarize clinicians with coaching tools that have the potential to turn inertia into action		Provincial Ballroom
Saturday, October 27, 2012			
7:00 a.m. – 8:00 a.m.	Biomedical Research Track	Workshop | Cross-Talk Between Mitochondrial and ER Death Pathways in the Heart – *Lorrie Kirshenbaum*	Elgin
		Workshop | What's Wrong with my Mouse? Cardiovascular and Metabolic Phenotyping of Genetically Modified Mice – *Robert Gros*	Wentworth
8:00 a.m. – 9:30 a.m.	Biomedical Research Track	**Co-Chairs:** Pierre Paradis & Robert Gros **8:00** State of the Art | Steroid Regulation of Vascular Function – *Ross Feldman* **8:30** Calpain Activation Contributes To High Glucose-Stimulated Endothelial Cell Injury and Endothelial Dysfunction in Diabetic Mice – *Bainian Chen* **8:45** Endothelin-1-Induced Oxidative Stress and Inflammatory Cell Infiltration Stimulate The Development of Aneurysms in High-Fat Diet-Fed Apolipoprotein E Knockout Mice – *Pierre Paradis* **9:00** Angiotensin 1-7 Attenuates Endothelin-1-Induced Endothelial Cell Inflammation and Growth Through Nitric Oxide Production and Activation of Mas and EndothelinB Receptors – *Hiba Yusuf* **9:15** Enhanced Endothelin-1 Signaling Underlies Sex-Specific Hypertension in Aged Intrauterine Growth Restricted Offspring – *Stephane Bourque*	Dominion North

*Primary Prevention Core Curriculum Track presented in association with Heart and Stroke Foundation, Ontario

	Clinical/Outcomes/ Population Research Track	**Co-Chairs:** Neil Poulter & Debra Butt **8:00** State of the Art | Long Term Blood Pressure Variability: A Potential Sea Change in Hypertension Management – *Neil Poulter* **8:30** Long-Term Physical Activity Adherence Following Cardiac Rehabilitation: A Multifactorial Analysis – *Danielle Bentley* **8:45** Sodium Levels in Canadian Fast-Food and Sit-Down Restaurants – *Mary Scourboutakos* **9:00** Stress Management is Associated with Reductions in Systolic Blood Pressure and Waist Circumference in Cardiac Rehabilitation – *Codie Rouleau* **9:15** The Risk of Falls on Initiation of Antihypertensive Drugs in the Elderly – *Debra Butt*	Dominion South
	Core Curriculum Track*	**Co-Chairs:** Don McKay & Lyne Cloutier **8:00** Dyslipidemia Update – *Robert Hegele* **8:30** Obesity Management – *Raj Padwal* **9:00** Out of Office Blood Pressure Measurement – *Donald McKay*	City Hall
10:00 a.m. – 11:30 a.m.	Biomedical Research Track	**Co-Chairs:** Stephane Bourque & John Chan **10:00** Insulin Inhibits Renal Angiotensinogen Gene Expression and Prevents Hypertension in Diabetic Akita Mice via Heterogeneous Nuclear Ribonucleoprotein F and K Expression – *John Chan* **10:15** Marked Neointimal Formation, Calcification and Vascular Remodeling in Coronary and Internal Pudendal Arteries From Aged Male Cadavers With Cardiovascular Disease – *Johanna Hannan* **10:30** Antisense Oligodeoxynucleotide of Giα-2 and Giα-3 Proteins Attenuate the Development of Hypertension in Spontaneously Hypertensive Rats – *Yousra El-Basyuni* **10:45** Catharanthine Dilates Small Mesenteric Arteries and Decreases Cardiac Contractility by Inhibition of L-type Calcium Channel Currents – *Ashok Jadhav* **11:00** State of the Art | We Are What We Smell: The Discovery of Hydrogen Sulfide in Biology and Medicine – *Rui Wang*	Dominion North
	Clinical/Outcomes/ Population Research Track	**Co-Chairs:** Robert Herman & Finlay McAlister **10:00** Canadian Attitudes Regarding Dietary Sodium and Government-Level Policy Interventions to Lower Canadian Sodium Intakes – *JoAnne Arcand* **10:15** Microvascular Hypertensive Emergencies: Absolute BP vs Change in MAP Baseline to MAP at PRES – *Robert J. Herman* **10:30** Tolerability and Effectiveness of Nebivolol Compared to Other Add-On Therapies for Hypertension: A Retrospective Chart Review – *Rajeev Ayyagari* **10:45** Expression of a Hypofunctional Genetic Variant of GPER is Associated With Increased Blood Pressure – *Yasin Hussain* **11:00** State of the Art | Can System Changes Improve Patient Outcomes? A Case Study in Heart Failure – *Finlay McAlister*	Dominion South
	Core Curriculum Track*	**Co-Chairs:** Malcolm Arnold & Sheldon Tobe **10:00** Atrial Fibrillation and Hypertension: Not Such Strange Bedfellows – *Paul Dorian* **10:30** Erectile Dysfunction Management – *Gerald Brock* **11:00** Systolic Dysfunction and Hypertension: Emerging Role of Aldosterone Antagonists – *Malcolm Arnold*	City Hall

*Primary Prevention Core Curriculum Track presented in association with Heart and Stroke Foundation, Ontario

11:30 a.m. – 1:30 p.m.	Clinical/Outcomes/ Population Research Track	**Poster Session III** *Note: Poster presentations will take place from 12:00 to 1:00 p.m.* **Poster #22** | Acute Blood Pressure Response to Isometric Handgrip Resistive Exercise in Post-Menopausal Women: A Pilot Study – *Danielle Bentley* **Poster #23** | Perceptions of Knowledge and Interprofessionalism Among Health Professional Students Participating in Cardiovascular Risk Reduction Initiative – *Christopher Cheung* **Poster #24** | Healthy Eating and Sodium Reduction - A National Campaign – *Elaine De Grandpre* **Poster #25** | Acute Kidney Failure After Renal Denervation – *Vlad Diaconita* **Poster #26** | Eligibility for Catheter-Based Renal Sympathetic Denervation Amongst Hypertensive Patients Specifically Referred for the Procedure – *Vlad Diaconita* **Poster #27** | Evaluation of the Effect of Cardiovascular Risk Assessment on Treatment Compliance in Hypertension – *Steven Gryn* **Poster #28** | Patients Exposed to Nifedipine Via Differing Osmotic Delivery Systems have Differing Patterns of Nocturnal Dipping – *Robert J. Herman* **Poster #29** | The Validity of Blood Pressure (BP) Kiosk Validation Studies: A Systematic Review – *Sherilyn Houle* **Poster #30** | Increased Von Willebrand Factor Predicts Sexual Dysfunction in Men but not in Women – *Tina Maio* **Poster #31** | Changes In Hypertension Treatment Efficiency by General Practitioners and Cardiologists of the Yaroslavl Region of Russia – *Maria E. Mozheyko* **Poster #32** | Orthostatic Stress Does Not Activate the Renin-Angiotensin-System in Physically Active Premenopausal Estrogen-Defficient Women – *Emma O'Donnell* **Poster #33** | Gout in Hypertension – *Samia L.L. Rizk*	Provincial Ballroom Foyer
1:30 p.m. – 3:00 p.m.	**Hypertension Canada Awards Plenary Session** **Co-Chairs:** Ross Feldman & Pierre Larochelle **George Fodor Award Lecture** | *Norm Campbell* **Efforts to Prevent and Control Hypertension in Canada: A Perspective on the Future** **Learning Objectives:** 1. To learn about 2020 targets proposed for the prevention and control of hypertension 2. To learn about potential approaches to prevention and control of hypertension that could be used to achieve the 2020 targets **Senior Investigator Award Lecture** | *Brenda Hemmelgarn* **Hypertension and Chronic Kidney Disease: Special Considerations** **Learning Objectives:** 1. To review the significance of hypertension in chronic kidney disease 2. To discuss blood pressure targets and measurement of blood pressure in chronic kidney disease 3. To discuss models of health care delivery and strategies for management of hypertension in chronic kidney disease		Dominion Ballroom
3:30 p.m. – 5:00 p.m.	**Hypertension Canada Annual General Meeting & Award Presentations**		Dominion Ballroom
5:00 p.m. – 7:00 p.m.	**Industry Central** Interactive Reception		Provincial Ballroom

Sunday, October 28, 2012		
8:00 a.m. – 9:30 a.m.	Research Policy Symposium | **The Vascular Network Forum** **Co-Chairs:** Duncan Stewart & Katie Lafferty **Faculty:** Mark Poznansky, Jean Rouleau and Duncan Stewart Challenges in Vascular Health Research in Canada – *Jean Rouleau* Translating Basic Biomedical Discoveries to People: Getting from Molecule to Man on the Fast Track – *Duncan Stewart* Utilizing Genomics Databases to Tackle Important Biological Questions – *Mark Poznansky*	Provincial Ballroom
10:00 a.m. – 11:30 a.m.	**A First Look at the 2013 Canadian Hypertension Education Program (CHEP) Recommendations** **Co-Chairs:** Raj Padwal & Luc Poirier **Faculty:** Finlay McAlister, Raj Padwal, Luc Poirier, Rob Quinn, Debra Reid and Sheldon Tobe Opening Remarks – *Luc Poirier* Recommendations on Screening for High Blood Pressure in Canadian Adults: A Joint Presentation of the Canadian Task Force on Preventive Health Care and CHEP – *Richard Birtwhistle* Evaluating the Impact of CHEP – Outcomes Assessments – *Finlay McAlister* Implementing Hypertension Evidence in Practice – *Debra Reid* Continuing Professional Education Initiatives – *Sheldon Tobe* New Evidence and the 2013 Draft CHEP Recommendations – *Rob Quinn, Luc Poirier and Raj Padwal* Discussion and Closing Remarks – *Raj Padwal* **Learning Objectives:** 1. To summarize the draft 2013 CHEP clinical practice recommendations 2. To report on the work of the Outcomes Task Force for 2012 3. To explain the rationale for changes leading to the 2013 CHEP recommendations	Provincial Ballroom

2012 George Fodor Award

Norm Campbell, MD
Professor of Medicine
Community Health Sciences, Physiology and Pharmacology
Libin Cardiovascular Institute of Alberta
University of Calgary
Calgary, Alberta

The 2012 George Fodor Award recognizes Dr. Norm Campbell for his distinguished record of substantial contributions that have increased prevention and improved control of blood pressure in Canada. Dr. Campbell's contributions have resulted in a lasting impact of national scope in many areas. Over and above the exemplary service and accomplishments related to blood pressure control, we wish to publicly recognize his unparalleled record of service in support of the mission of Hypertension Canada. For over 20 years Dr. Campbell has taken chief leadership roles in every volunteer-based, national initiative in hypertension in Canada, including the Canadian Hypertension Society, the Canadian Hypertension Education Program, Blood Pressure Canada and Hypertension Canada. We further acknowledge his commitment and crusading work in the development of healthy public policies supportive of lower blood pressure and dietary sodium levels.

2012 Senior Investigator Award

Brenda Hemmelgarn, MD, MSc, PhD
Associate Professor
Departments of Medicine and Community Health Sciences
University of Calgary
Roy and Vi Baay Chair in Kidney Research
Director, Alberta Kidney Disease Network (AKDN)
Chair, Canadian Society of Nephrology Clinical Practice Guidelines
Calgary, Alberta

The 2012 Senior Investigator Award recognizes Dr. Brenda Hemmelgarn for her longstanding dedication and numerous contributions to both research and health services in Canada. Dr. Hemmelgarn's history of research awards, extensive publications and mentoring other investigators evidences both her high academic ability and her commitment to research in Canada. In addition to Dr. Hemmelgarn's research commitments, she has been a volunteer with the Canadian Hypertension Education Program since 2002 as a strong contributor to both the Recommendations Task Force and the Central Review Committee, chairing the committee from 2006 to 2010. We applaud her research interests in the study of chronic kidney disease and end-stage renal disease, including the use of computerized databases. Dr. Hemmelgarn has been innovative in her research with the use of a laboratory-based surveillance system. She has addressed the prevalence of chronic kidney disease as well as access to specialized medical care in the elderly and Aboriginal groups, which are considered high-risk populations. Her work also includes conducting research regarding the cardiovascular complications of kidney disease using computerized databases, and we commend her involvement in the National Hypertension Surveillance System for hypertension.

2012 Distinguished Service Award

Michael A. Adams, MSc, PhD
Professor
Department of Biomedical and Molecular Sciences
Queens University
Kingston, Ontario

The 2012 Distinguished Service Award recognizes Dr. Michael A. Adams for his longstanding distinguished record of service to the organization. Dr. Adams' commitment has been exemplary, spanning over 24 years of membership and volunteer support to advance the control of hypertension in Canada. He has clearly demonstrated a particular focus on research, always encouraging and mentoring research trainees. His leadership was repeatedly demonstrated through committee membership and as a board member of CHS. Dr. Adams' participation on the Board of Directors included executive positions and advancement to the role of President-Elect at the time of integration to form Hypertension Canada. His leadership was further evidenced as a member of the transition team, where he helped shape Hypertension Canada and championed continued support of research strategies. We acknowledge and thank Dr. Adams for his significant voluntary service contributions to Hypertension Canada and his prolonged contributions in particular to the Canadian Hypertension Society (CHS) over his career.

2012 Certificates of Excellence

In recognition of outstanding efforts and contributions in Canada to increase public awareness, prevention and control of hypertension.

Alain Milot, MD, MSc
Professor, Faculty of Medicine
Laval University
Internist and Pharmacologist
Quebec University Hospital
Quebec, Quebec

Dr. Alain Milot's Certificate of Excellence Award recognizes his work as co-chief editor in developing an innovative electronic version of the fourth edition of the Therapeutic Guide. We acknowledge his shared leadership role in coordinating the work of many authors contributing to the development of this electronic tool which will reach a wider audience, beyond Canada's borders, with current and credible information for the treatment of hypertension. We commend him for his efforts to educate the medical community about hypertension and his positive approach to health management and chronic disease.

Denis Drouin, MD
Clinical Professor of Family Medicine and Emergency Medicine
Associate Director, Continuing Medical Education Office
Laval University School of Medicine
Primary Care Physician and Medical Director
Centre médical LeMesnil, Complexe de santé de la capitale
Quebec, Quebec

Dr. Denis Drouin's Certificate of Excellence Award recognizes his work as co-chief editor in developing an innovative electronic version of the fourth edition of the Therapeutic Guide. We acknowledge his shared leadership role in coordinating the work of many authors contributing to the development of this electronic tool which will reach a wider audience, beyond Canada's borders, with current and credible information for the treatment of hypertension. We commend him for his efforts to educate the medical community about hypertension and his positive approach to health management and chronic disease.

Rolande Landry, IP/NP

Rolande Landry's Certificate of Excellence Award recognizes her work focusing on prevention in the primary care setting and acknowledges the quality service she provides to a wide population, where the percentage of chronic disease is among the highest in New Brunswick. Ms. Landry worked with other health care professionals to start a hypertension clinic to screen and teach people about blood pressure, utilizing CHEP recommendations and Hypertension Canada's educational resources based on the CHEP recommendations. In addition to broadly disseminating information, she initiated the program "How to keep your heart healthy," and goes to schools to teach teenagers about chronic disease, hypertension and the importance of healthy daily living. We commend her for her efforts to build a strong community and her positive approach to health management and chronic disease.

France Boulianne
Director, SQHA (La Société québécoise d'hypertension artérielle)

France Boulianne's Certificate of Excellence Award recognizes her co-development of the "Prise en charge systématisée des personnes atteintes d'hypertension artérielle." We commend her for her work on this project that provides education for health care professionals who are caring for patients with chronic disease. The development of the tool responds to the increased team approach for patients being treated in clinical situations in Quebec. It will certainly meet the goal of preparing health professionals to ensure adequate monitoring of patients with hypertension. In giving this award, we particularly commend Ms. Boulianne's efforts in developing these innovative electronic training modules. We appreciate her efforts to educate the medical community about hypertension and her positive approach to health management and chronic disease.

2012 Certificates of Excellence (cont'd)

Lyne Cloutier, RN, PhD
Professor
Université du Québec à Trois-Rivières
Trois-Rivières, Quebec

Lyne Cloutier's Certificate of Excellence Award recognizes her co-development of the "Prise en charge systématisée des personnes atteintes d'hypertension artérielle." We commend her for her work on this project that provides education for health care professionals who are caring for patients with chronic disease. The development of the tool responds to the increased team approach for patients being treated in clinical situations in Quebec. It will certainly meet the goal of preparing health professionals to ensure adequate monitoring of patients with hypertension. In giving this award, we particularly commend Dr. Cloutier's efforts in developing these innovative electronic training modules. We appreciate her efforts to educate the medical community about hypertension and her positive approach to health management and chronic disease.

Luc Poirier, MSc
Pharmacist
Hypertension Clinic and Pharmacy Department
CHU de Québec - CHUL
Quebec, Quebec

Dr. Luc Poirier's Certificate of Excellence Award recognizes his co-development of the "Prise en charge systématisée des personnes atteintes d'hypertension artérielle." We commend him for his work on this project that provides education for health care professionals who are caring for patients with chronic disease. The development of the tool responds to the increased team approach for patients being treated in clinical situations in Quebec. It will certainly meet the goal of preparing health professionals to ensure adequate monitoring of patients with hypertension. In giving this award, we particularly commend Dr. Poirier's efforts in developing these innovative electronic training modules. We appreciate his efforts to educate the medical community about hypertension and his positive approach to health management and chronic disease.

Regional Kidney Wellness Centre

The Certificate of Excellence awarded to the Regional Kidney Wellness Centre, in association with William Osler Health System, recognizes their work in Brampton, Ontario: providing patients with the education, counselling and tools to make lifestyle changes and take control of their own health. Some of the efforts this award recognizes include:

- Their recognition that blood pressure control is an essential part in controlling the progression of kidney disease and, therefore, providing patients with the tools and support to help them better manage their blood pressure and overall health.
- The creation of the Regional Kidney Wellness Centre and a multidisciplinary team that provides consultation for lifestyle changes that help reduce patients' modifiable risk factors for the progression of kidney disease and cardiovascular disease.
- The incorporation of follow-up mechanisms in all aspects of the program to ensure compliance and motivate change by the patient.

We commend the multidisciplinary team for their efforts and positive approach to health management in chronic disease and high-risk patients.

2012 Certificates of Excellence (cont'd)

The Certificate of Excellence awarded to the Canadian Journal of Cardiology (CJC) recognizes its commitment to the national hypertension initiative for prevention and control.
Some of the efforts this award recognizes include:

- CJC has been a forerunner in publishing material on knowledge translation before it was considered a science.
- CJC has chronicled the history of the Canadian Hypertension Education Program, dissemination of knowledge and related outcomes.
- Numerous articles have been published in an annual hypertension-themed issue and, recently, critical articles were published for the sodium effort in Canada.

We commend CJC for its efforts and positive approach to knowledge translation and dissemination in Canada. The Canadian Cardiovascular Society is the proud owner of the Canadian Journal of Cardiology.

The Certificate of Excellence awarded to the British Columbia Ministry of Health–Healthy Families BC Sodium Reduction Strategy recognizes the innovative approaches used to disseminate consumer focus-tested sodium reduction messages developed in collaboration with Dietitians of Canada, EatRight Ontario and Health Canada. The outcomes we recognize with this award include:

- Province-wide dissemination through multiple channels including web and digital engagement, social media, mass media and contests.
- High recall and awareness of the sodium reduction messages as demonstrated by assessments (pre- and post-campaign) of consumers' recall of campaign elements including the Sodium City TV spot; transit, print and digital ads; and posters.

We commend the team at Healthy FamiliesBC for their efforts and positive approach to health management and chronic disease.

The Certificate of Excellence awarded to Loblaw pharmacy/DRUGStore Pharmacy recognizes their work focusing on sodium reduction through the S.A.L.T. campaign.
The efforts this award recognizes include:

- The development and implementation of the S.A.L.T. (Sodium Awareness Lifestyle Tips) program launched in February 2012 that ran for a full month in their stores.
- Their month-long patient engagement activity centred on cardiovascular health with a special focus on sodium intake guidelines according to Hypertension Canada's CHEP recommendations.
- Educating consumers about the link between sodium and hypertension, appropriate daily intakes of sodium, and the need to track personal sodium intake.

We commend them for their efforts and positive approach to health management and chronic disease.

Thursday, October 25, 2012

4:35 p.m. – 6:00 p.m.

Biomedical Research Track

Poster Session I

Note: Poster presentations will take place from 5:00 to 6:00 p.m.

Poster Presentation 4:35 - 6:00 p.m.

P1 - In Vitro Nischarin Overexpression Opposes Cell Death Induced By Oxidative Stress

Henry Aceros[1], Nicolas Noiseux[2], Suhayla Mukaddam-Daher[3]

[1] Department of Pharmacology, Université de Montréal, and CRCHUM, Montreal, Quebec
[2] Department of Medicine, Université de Montréal, and CRCHUM, Montreal, Quebec
[3] Departments of Medicine and Pharmacology, Université de Montréal, and CRCHUM, Montreal, Quebec

Introduction: Nischarin (murine imidazoline I1-receptor) has been implicated in central regulation of blood pressure and cardiovascular control. Nischarin associates with 5 integrin, and its over-expression in a fibroblastic cell line inhibits motility through inhibition of integrin 5-Rac1 signalling. Rac1 activation is linked to generation of ROS, hypertrophy, proliferation and apoptosis. The association of nischarin to Rac1 prompted us to investigate the role of nischarin in cell survival in response to oxidative stress, and the signalling proteins implicated in cell death and survival.

Methods and Results: HEK293 cells were transfected with GFP-nischarin or empty vector using lipofectamine. 48 h post-transfection, cells were plated in 96-or 6-well plates for 24 h in DMEM+10%FBS. After starvation (DMEM+0.1%FBS) for 12 h, cells were incubated with H2O2 10-4 M. I1-receptor effects were evaluated by co-incubation with a selective agonist, moxonidine (10-7 and 10-5 M) with or without the antagonist AGN192403 (10-5 M). Cell viability was measured after 48 h by MTT. Protein phosphorylation and nischarin expression were measured by Western blot.
Results show that, compared with control cells (100%), nischarin over-expression did not modify basal viability, but increased viability in response to moxonidine (10-7 M) (117%±3; $P<0.03$), effect reversed by AGN192403. Nischarin transfected cells had higher ERK1/2 (151%±13, $p<0.001$) and JNK (121%±6, $p<0.001$) phosphorylation, incubation with moxonidine abolished this increase. In control cells H2O2 significantly ($P<0.05$) reduces survival, associated with reduced Akt phosphorylation; but not in nischarin-transfected cells.

Conclusions: These results show that nischarin overexpression increases cell survival by mechanisms including ERK and JNK phosphorylation. Nischarin overexpression potentiates cell viability in response to moxonidine and opposes cell-death induced by oxidative stress. These studies are consistent with the notion that the level of nischarin expression can account for many aspects of cardiac remodelling, and point to local over-expression of nischarin as a therapeutic tool against consequences of ROS. *CIHR and HSF.*

Poster Presentation 4:35 - 6:00 p.m.

P2 - Role of Protein Kinase C Delta in Enhanced Expression of Gq Protein and Vascular Smooth Muscle Cells Hypertrophy in Spontaneously Hypertensive Rats

Atef ME[1], Anand-Srivastava MB[1]

[1] Department of Physiology, Faculty of Medicine, Université de Montréal, Quebec, Canada

Background: We earlier showed that vascular smooth muscle cells (VSMCs) from 16 week-old spontaneously hypertensive rat (SHR) exhibit enhanced expression of Gq protein which was associated with enhanced VSMCs hypertrophy. Since, protein kinase C delta (PKC delta) was shown to be implicated in VSMCs hypertrophy induced by angiotensin II (ANG II), we undertook the present study to examine the implication of PKC delta isoform in the enhanced protein synthesis in VSMCs from 16 week-old SHR and possible underlying molecular mechanism for the hypertrophic response.

Methods and Results: VSMCs from SHR exhibited enhanced expression of Gq protein and enhanced phosphorylation of PKC delta at Tyr311 compared to VSMCs from WKY rats, as determined by Western blot analysis, which were attenuated in a concentration dependant manner by PKC delta inhibitor, rottlerin. In addition, rottlerin also attenuated the enhanced protein synthesis of VSMCs from SHR, as determined by [^{3}H]-leucine incorporation. Furthermore, the enhanced expression and phosphorylation of IGFR and EGFR exhibited by VSMCs from SHR were also inhibited by rottlerin in a concentration dependant manner. Moreover, the augmented phosphorylation of ERK1/2 in VSMCs from SHR was attenuated significantly by rottlerin.

Conclusion: These results suggest that PKC delta through growth factor receptor activation and MAP kinase signaling increases the expression of Gq protein and thereby protein synthesis in VSMCs from SHR.

This study was supported by a grant from the Canadian Institutes of Health Research (CIHR).

Poster Presentation 4:35 - 6:00 p.m.

P3 - Exercise Reduced Erythropoietin-Induced Hypertension and Vascular Injury in Mice Overexpressing Human Endothelin-1

Barhoumi T[1], Briet M[2], Paradis P[2], Laurant P[2], Schiffrin EL[3]

[1, 2, 3] McGill University and Jewish General Hospital, Lady Davis Institute for Medical Research, Montreal, Quebec

Introduction: Erythropoietin (EPO) is used to correct anemia in chronic kidney disease (CKD). EPO has been shown to increase blood pressure (BP) in patients and animals with CKD, which can be blunted by endothelin (ET) A receptor blockers. Chronic exercise prevents or reduces development of cardiovascular disease. However, it is unknown whether exercise prevents EPO-induced hypertension. We hypothesized that EPO treatment would exacerbate endothelin (ET)-1-induced vascular damage and increase BP, and that exercise training might prevent these effects.

Methods and Results: Eight to 10-week old male mice overexpressing human preproET-1 in the endothelium (eET-1) and wild-type were treated with EPO (100 U/kg, s.c, 3 times/week) or not, and subjected or not to swimming exercise (1 h/d, 5 d/week) for 8 weeks (n=7-8). Systolic BP (SBP) was measured by the tail-cuff method. Endothelial function was assessed by pressurized myography. NADPH oxidase activity was assessed by lucigenin chemiluminescence, reactive oxygen species (ROS) by dihydroethidium staining, and monocyte/macrophage and T-regulatory cell (FoxP3) infiltration by immunofluorescence staining. EPO increased SBP by 24 mmHg ($P<0.05$) and impaired vasodilatory responses of mesenteric arteries to acetylcholine by 25% ($P<0.01$). NADPH oxidase activity in aorta and renal cortex was 2-fold higher in eET-1 than wild-type ($P<0.05$), and further increased 1.5-fold by EPO ($P<0.01$). EPO increased ROS production in aorta of wild-type 2-fold ($P<0.01$) and in eET-1 by a further 9-fold ($P<0.01$). EPO increased monocyte/macrophage infiltration in aorta of wild-type 2.5-fold ($P<0.01$) and in eET-1 by a further 2.7-fold ($P<0.05$). All of the above was prevented by exercise ($P<0.05$). Exercise with or without EPO increased FoxP3+ lymphocytes in renal cortex 3-fold in eET-1 ($P<0.01$).

Conclusion: We conclude that exercise prevents EPO-induced BP elevation and vascular damage through a mechanism involving decreased vascular oxidative stress and inflammation, which could be mediated, at least in part, by an increase in anti-inflammatory effects of T-regulatory cells.

Poster Presentation 4:35 - 6:00 p.m.

P4 - Reduced Macrophage-Dependent Inflammation Prevents Endothelin-1 Vascular Detrimental Effects

Barhoumi T[1], Paradis P[2], Danesh J[2], Schiffrin EL[3]

[1, 2, 3] McGill University and Jewish General Hospital, Lady Davis Institute for Medical Research, Montreal, Quebec

Introduction: Transgenic mice with endothelium specific preproendothelin-1 overexpression (eET-1) exhibit endothelial dysfunction and vascular remodeling, oxidative stress and inflammation independently of hemodynamic effects. However, it is unclear whether vascular inflammation is causally implicated in adverse vascular effects of endothelin-1 (ET-1). We hypothesized that ET-1-induced vascular injury is decreased in a model of reduced macrophage-dependent inflammation, macrophage colony stimulating factor (mCsf) mice heterozygote for the osteopetrosis (Op) mutation.

Methods and Results: Wild-type, eET-1, mCsfOp/+ and eET-1/mCsfOp/+ mice were studied. There was no difference in tail-cuff systolic blood pressure between groups. Endothelial function and vascular structure were determined on a pressurized myograph. Endothelium-dependent relaxation in response to acetylcholine was similar in eET-1 and eET-1/mCsfOp/+. However, in the presence of L-NAME, the magnitude of NO-independent relaxation was greater in eET-1/mCsfOp/+ compared to eET-1 (72.4±6.7% vs. 40.8±14.4%, $P<0.001$). Media-to-lumen ratio was greater in eET-1 than wild-type mice (0.13±0.01 vs. 0.08±0.01, $P<0.01$) and unchanged in eET-1/mCsfOp/+ (0.10±0.01). Media cross-sectional area (μm2) was greater in eET-1 than wild-type mice (13521 ±2106 vs. 8112±381, $P<0.05$) and unchanged in eET-1/mCsfOp/+ (8966±1125). Dihydroethidium staining revealed that reactive oxygen species production in aorta was 4-fold higher in eET-1 than wild-type mice ($P<0.01$) and unchanged in eET-1/mCsfOp/+. Aortic monocyte/macrophage infiltration was increased 2.6-fold in eET-1 ($P<0.01$) and tended to decrease by 45% in eET-1/mCsfOp/+ compared to wild-type mice.

Conclusion: Reduction of macrophage-dependent inflammation in mice overexpressing ET-1 in endothelium results in improved vascular relaxation and reduced vascular remodeling, oxidative stress and inflammation, providing evidence for a role of macrophages and innate immunity in ET-1-induced vascular damage.

Poster Presentation 4:35 - 6:00 p.m.

P5 - Effects of Endothelial Microparticles on Endothelial Cell Signaling in Vitro and EndotheliumFunction in Isolated Mesenteric Arteries

Burger D[1], Montezano AC[2], He Y[2], Touyz R[3]

[1, 2, 3] University of Ottawa, Ottawa Hospital Research Institute, Ottawa, Ontario

Introduction: Microparticles (MPs), fragments of membrane shed from stressed/damaged cells, are found in the plasma of healthy individuals with levels increased in hypertension and vascular disease. However, whether MPs themselves contribute to endothelial dysfunction is unclear. We examined the effects of endothelial MPs on cultured endothelial cells (ECs) in vitro and on the function of isolated mesenteric arteries ex vivo.

Methods and Results: Endothelial MPs were isolated from the media of cultured mouse aortic ECs and quantified by flow cytometry. ECs were treated with endothelial MPs (105/ml) and effects on kinase signaling (Akt, c-Src, ERK1/2), superoxide (•O2-) generation (dihydroethidium) and NO production (diaminofluorescin) were examined. Endothelial MPs increased phosphorylation of ERK1/2 at 5, 15, and 30 minutes post-treatment ($P<0.05$) and c-Src at 2, 4, and 8 hours post-treatment ($P<0.05$). Phosphorylation of Akt was not altered by MP exposure, however MPs increased the production of •O2- (208% of control, $P<0.05$) and decreased ionomycin-induced NO production (39% of control, $P<0.05$) in ECs after 4 hours. Additionally, endothelial function was assessed in 2nd order mesenteric arteries using wire myography. Maximum vasodilatory response to acetylcholine was not different between vessels incubated in the presence of endothelial MPs (105/ml, 30 mins) and control vessels (75±10% vs. 88±5% respectively, $P>0.05$). In contrast, the sensitivity to acetylcholine was impaired in MP-treated vessels (pD2: 5.6±0.2) compared to untreated vessels (pD2: 6.7±0.1, $P<0.01$). Finally, we explored mechanisms by which MPs achieve their effects. Co-treatment with an epidermal growth factor receptor inhibitor (AG1478, 10 μM) but not a platelet-derived growth factor receptor inhibitor (AG1296, 10 μM) blocked microparticle-mediated effects on •O2-, and NO in ECs.

Summary: We demonstrate that endothelial MPs impair vasorelaxation ex vivo and activate kinase signaling pathways, promote •O2- production and inhibit NO production in vitro. These effects may be mediated, at least in part, through EGFR.

Poster Presentation 4:35 - 6:00 p.m.

P6 - Podocyte Microparticle Formation is Increased Following Glomerular Injury

Burger D[1], Thibodeau JF[2], Holterman CE[2], Touyz R[2], Kennedy CRJ[3]

[1, 2, 3] University of Ottawa, Ottawa Hospital Research Institute, Kidney Research Center, Ottawa, Ontario

Introduction: Hypertension is a significant cause of progressive kidney disease, particularly in the presence of diabetes. Under such conditions, increased glomerular capillary pressure subjects podocytes, specialized glomerular epithelial cells critical to filtration, to mechanical stress resulting in podocyte injury/dysfunction. Microparticles (MPs) are submicron cellular fragments shed under conditions of stress/injury. We examined whether podocytes produce MPs and whether podocyte MP formation is indicative of glomerular injury.

Methods and Results: MP formation was examined in a human podocyte cell line (HPOD) and in two mouse models of diabetic kidney disease: streptozotocin (STZ) and OVE26. MPs were isolated from media/urine and quantified by Annexin Vor podocalyxin (podocyte-specific antigen) labeling and flow cytometry. HPODs were either exposed to 10% cyclical stretch (a mimic of podocyte distension by intraglomerular hypertension), high glucose conditions (HG), or treated with angiotensin II (Ang II) or transforming growth factor beta (TGF-β. Cyclic stretch increased HPOD MP formation after 5 hours (~3-fold, $P<0.01$). Similarly, HG increased MP formation after 24 hours (~2-fold, $P<0.05$). Neither Ang II, nor TGF-βaltered MP formation. To determine the in vivo significance of podocyte MP formation, we probed whether podocytes release MPs into the urine of diabetic mice. Both mouse models of kidney injury exhibited glomerular injury (mesangial expansion) and frank proteinuria as evidenced by increased urinary albumin/creatinine levels compared with controls (STZ: 1312±224 μg/mg vs 264±130 at 8 weeks, $P<0.001$; OVE26: 391±130 μg/mg vs. 29±6 at 16 weeks, $P<0.05$). STZ-treated mice displayed increased urinary podocyte MPs as compared with untreated mice (17478±8329 MPs/mg Creatinine vs. 7 ±7, $P<0.05$). Similarly, OVE26 mice displayed increased urinary podocyte MPs compared with wild-type littermates (6956±2386 vs. 9±9, $P<0.01$).

Conclusion: Taken together our results suggest that podocytes produce MPs which are released into urine and may be indicative of glomerular injury. These processes may be mediated by mechanical stretch and high glucose conditions.

Poster Presentation 4:35 - 6:00 p.m.

P7 - Altered C-Src Activity by Aldosterone in Vascular Smooth Muscle Cells from SHR Involves PDGFR, C-Terminal Src Kinase (CSK) and CSK-Binding Protein (CBP)

Callera G[1], Montezano A[2], Yogi A[2], Touyz R[3]

[1, 2, 3] University of Ottawa, Ottawa Hospital Research Institute, Ottawa, Ontario3. Faculty of Pharmacy, University of Montréal, Montreal, Quebec

Introduction: In the present study we examined molecular mechanisms underlying aldosterone-mediated aberrant regulation of c-Src, by focusing on processes that control c-Src catalytic activation as well as recruitment of enzyme regulators in SHR vascular smooth muscle cells (VSMCs). Through intramolecular interactions, c-Src undergoes conformational changes that determine its activation state. The inactive conformation occurs when the phosphorylated Tyr527 binds to the SH2 domain of the kinase. In cultured VSMCs from WKY aldosterone (100 nM) induced c-Src Tyr527 phosphorylation (153.5 ± 13.6 %), whereas this response was blunted in SHR cells indicating the lack of the regulatory loop of the kinase. C-terminal Src kinase (Csk) is a cytosolic kinase that catalyzes c-Src Tyr527 phosphorylation. This kinase is recruited to the membrane by the phosphorylated form of its transmembrane adaptor protein Csk-binding protein (CBP), in order to regulate c-Src activity. Aldosterone-stimulated VSMCs from SHR displayed reduced Csk content in the membrane fractions and lower levels of CBP phosphorylation compared with cells from WKY. Phospho-caveolin-1 (Cav 1 Tyr14) serves as a docking protein for recruiting Csk to membrane microdomains for the negative regulation of c-Src.

Results: Aldosterone induced Cav-1 phosphorylation increase in cells from WKY with a reduced response in those from SHR (176.4 ± 18.0 vs 116.3 ± 8.2 %). PDGFR is a potent activator of c-Src catalytic activity through the phosphorylation of the Tyr216 in the SH2 domain of the kinase, which overrides the inhibitory action of the Tyr 527. Aldosterone induced an increase in phosphorylation of both PDGFR (186.6 ± 26.2 vs 281.9 ± 26.7 %) and c-Src Tyr216 (145 ± 10.1 vs 200 ± 22.2 %) in VSMCs from SHR versus WKY.

Summary: Our findings demonstrate that key regulators of c-Src activation by aldosterone, specifically PDGFR, Csk and CBP, are altered in SHR VSMCs.

Poster Presentation 4:35 - 6:00 p.m.

P8 - Modularization Effectuates Homeostatic Design Organizing Blood Pressure Quantitative Trait Loci

Crespo K[1], Chauvet C[1], Menard A[2], Deblois D[3], Aguila B[4], Laporte S[5], Roy J[2], Deng A[6]

[1, 2, 6] Research Center, Centre hospitalier de l'Université de Montréal (CRCHUM), Department of Medecine, University of Montréal, Montreal, Quebec
[3] Faculty of Pharmacy, University of Montréal, Montreal, Quebec
[4] Department of medecine, endocrinology and metabolism, McGill University, Monteal, Quebec
[5] Department of medecine, experimental medecine, McGill University, Montreal, Quebec

Introduction: Our understanding of the genetic mechanisms determining polygenic hypertension can be facilitated by the study of the Quantitative Trait Loci for Blood Pressure (BP QTLs) and their interaction. BP QTLs can be analyzed via congenic strains; where only a specific chromosome segment from a recipient strain is replaced by its homologue from a donor. Our study was based on the analysis of the interaction between QTLs by building double congenic combinations based on the hypertensive Dahl Salt-sensitive (DSS) murin model.

Methods: A total of 27 combinations were obtained and all the QTLs were assembled according to their epistatic versus additive relationships leading us to characterise three functional Epistatic Modules (EM): EM1, EM2 and EM3; where every member of one EM can contribute to BP additively to that of another EM but not to those of the same EM. 31% of the human genes within 28 known BP QTLs which function could play a role in the regulation of BP are included in 8 congenic strains. Their rat homologues belong to either EM1 or EM2. Thus, based on our results, these 13 human genes should work in 2 epistatic modules affecting BP.

Results: The analysis of the 13 genes in the rat model led us to eliminate some genes as positive candidate genes for BP QTL as they did not harbor any mutation between the hypertensive strain (DSS) and the normotensive strain. As well, 11 of 42 genes were eliminated since the QTLs they were composing were negative for hypertension in our model.

Conclusion: This study showed that it is not the addition of various QTLs that regulates BP, but the epistatic interaction between them. The discovery of new QTLs interaction networks should lead us to a more accurate comprehension of BP regulation and should allow finding better combination of anti-hypertensive drugs targeting different modules.

Poster Presentation 4:35 - 6:00 p.m.

P9 - The Effects of Estrogen in Rat Vascular Endothelial Cells are not Dependent on GPER

Ding Q[1], Chorazyczewski J[2], Gros R[3], Feldman R[3]

[1, 2, 3] University of Western Ontario, Robarts Research Institute, London, Ontario

Introduction: GPER (aka GPR30) has been identified as an important mechanism by which estrogen mediates its effects. Previous studies from our laboratories (and those of others) have demonstrated that: i) GPER activation mediates a range of vascular contractile and growth regulatory responses ii) GPER is activated by both estradiol and aldosterone in vascular smooth muscle cells iii) aldosterone-mediated regulation of rat aortic vascular endothelial responses is mediated by GPER. However, the importance of GPER in mediating the actions of estradiol (E2) in rat aortic endothelial cells is unknown.

Methods and Results: Therefore we sought to determine the importance of GPER (vs. the "classical" estrogen receptor- ER) in mediating the endothelial growth regulatory effects of E2. To do this we assessed the effect of E2 in regulating phosphoERK content and apoptotic rates in rat aortic endothelial cells and the role of GPER in mediating these effects. E2 mediated a dose-dependent inhibition of both ERK phosphorylation (pERK) and serum deprivation-induced apoptosis with a maximum effect at a concentration of 10nM. Pretreatment with ER antagonist ICI 182780 abolished E2-mediated inhibition of both ERK phosphorylation and apoptosis (pERK: E2: 51±6% of control, E2+ICI: 103±2%; apoptosis: E2: 63±3%; E2+ICI: 95±4%). In contrast, pretreatment with GPER antagonist G15 has no significant effect on E2-mediated inhibition of ERK phosphorylation or on apoptosis (pERK: E2: 51±6% of control; E2+G15: 52±10%; apoptosis: E2: 63±3%; E2+G15: 67±7%). Further, downregulation of GPER expression with a GPER shRNA adenovirus did not block E2-mediated inhibitory effects on ERK phosphorylation and apoptosis. In fact, these inhibitory effects of E2 were further enhanced by GPER downregulation (pERK: E2 with shGFP [sham shRNA] expression: 68±3% of control; E2 with shGPER expression: 40±5%; apoptosis: E2 with shGFP: 59±3%; E2 with shGPER: 46±3%, $p<0.05$). In contrast, downregulation of ER expression turned the E2-mediated inhibitory effects to stimulatory effects (pERK: E2 with shGFP: 43±17% of control; E2 with shER: 151±9%; apoptosis: E2 with shGFP: 65±6%; E2 with shER: 146±4%). E2's phosphoERK and apoptosis stimulatory effects seen with ER downregulation were attenuated by the pretreatment with G15 (pERK: E2: 159±8% of control; E2+G15: 96±18%; apoptosis: E2: 156±5%, E2+G15: 110±5%). In conclusion, in rat aortic endothelial cells, E2-mediated endothelial effects are predominantly driven by ER and not by GPER. This contrasts with our previous findings of the dependence of aldosterone's endothelial effects on GPER expression.

Summary: Thus, at least in this model, aldosterone, not estradiol, is more important in mediating the ERK-stimulating, proapoptotic effects of GPER activation.

Poster Presentation 4:35 - 6:00 p.m.

P10 - Implication of the Renin-Angiotensin System and Angiogenic Balance in the Effects of Exercise Training in an Animal Model of Preeclampsia Superimposed on Chronic Hypertension

Genest D[1], Falcao S[2], Michel C[2], Kajla S[2], Lacasse A-A[2], Vaillancourt C[2], Gutkowska J[2], Lavoie JL[3]

[1, 2, 3] University of Montreal Research Center (CRCHUM), Montreal, Quebec

Introduction: Chronic hypertension is an important risk factor for preeclampsia, as it increases the prevalence of the disease to 15-25%. Studies have found that exercise training (ExT) may protect against preeclampsia, although the mechanisms remain unclear.

Objectives: Determine the mechanisms implicated in the beneficial effects of ExT on preeclampsia superimposed on chronic hypertension (SPE). Methods: Mice overexpressing both human renin and angiotensinogen (R+A+) were used as a model of SPE. Mice were placed in cages with free access to an exercise wheel 4 weeks prior to and during pregnancy. At gestational day 18, mice were sacrificed to harvest and weigh organs. Genes and proteins were assessed by real-time PCR and Western Blot, respectively. Circulating sFlt-1 (soluble Fms-like tyrosine kinase-1) was investigated by ELISA. Placental alterations were assessed by histology, while blood pressure was measured by radiotelemetry.

Results: Sedentary R+A+ mice presented with significantly greater placental alterations. This was normalized with exercise training and consequently, both total fetal weight and fetal/placental weight ratio were increased. Interestingly, R+A+ mice presented with a significant increase in placental VEGF protein, which was decreased with training. Placental sFlt-1 expression and circulating sFlt-1 levels were also increased in our model but were decreased by ExT. Additionally, sedentary R+A+ mice had a significant increase in angiotensin type 1 receptor and decrease in Mas receptor protein in the placenta which was normalized by ExT. Additionally, exercise significantly increased the angiotensin-converting enzyme 2 (ACE2) protein, independent of genotype. Finally, ExT prevented the increase in blood pressure observed with gestation in sedentary R+A+ mice. This may be as a result of the significant increase in ACE2 and Mas receptor protein observed with training in aortas.

Conclusion: Exercise training both before and during gestation appears to promote placental development and reduce blood pressure by modulating angiogenic balance and the renin-angiotensin system.

Poster Presentation 4:35 - 6:00 p.m.

P11 - Cytoprotective Signaling in Oxytocin-Induced Cardioprotection from Ischemia - Reperfusion

Gonzalez Reyes A [1], Gutkowska J [1], Jankowski M [1]

[1] Centre de recherche de centre hospitalier de l'université de Montréal (CRCHUM) Hôtel-Dieu, Montreal, QC, Canada

Introduction: The death of cardiomyocytes represents a major problem following an ischemia -reperfusion (IR) event. It has been repeatedly shown that oxytocin (OT) treatment decreases infarct size in animal hearts exposed to IR. Consequently, we investigated the hypothesis that OT triggers cytoprotective signalling in cardiomyocytes exposed to IR.

Methods: The cardiomyoblastic cell line H9c2 was used as a model of cardiomyocyte. For IR injury, the cells were placed in ischemic buffer and incubated in an anoxic chamber for 2 hours. Reperfusion was achieved by restoring cell media under normoxic conditions. OT was administered in the presence or absence of enzyme inhibitors. Cell death was evaluated by TUNEL and mitochondrial activity by formazan production during 1-4 hours of reperfusion. Confocal microscopy served for localization of cell structures.

Results: The experimental model of IR in H9c2 cells was characterized by decreased formazan production (at the range of 50-70% of normoxic control, $p < 0.001$) and by the increased number of TUNEL-positive nuclei (11.7±4.5 vs. 1.3±0.7% in normoxic control). The addition of OT (10-7 to 10-9 M) at the onset of reperfusion reversed the effects of IR to the control levels ($p < 0.001$). The protective effect of OT was abrogated by: i) an OT antagonist, OTA and siRNA-mediated OT receptor knockout; ii) the phosphatidylinositol 3-kinases inhibitor wortmannin; iii) the cGMP-dependent protein kinase (PKG) inhibitor, KT5823. Soluble guanylate cyclase (GC) inhibitor ODQ and particulate GC antagonist A71915 only partially blocked the protective effects of OT. Confocal analysis of OT-treated cells revealed translocation of OT receptor and the phosphorylated form of Akt (Thr 308, pAkt) into the nucleus and mitochondria.

Conclusions: OT directly protects cardiomyocyte viability if administered at the onset of reperfusion by triggering signaling of PI3K, Akt phosphorylation and its cellular trafficking. OT-mediated cytoprotection involves cGMP production by both forms of GC.

Friday, October 26, 2012

Friday, October 26, 2012

11:30 a.m. – 2:00 p.m.

Biomedical Research Track

Poster Session II

Note: Poster presentations will take place from 1:00 to 2:00 p.m.

Oral Presentation 8:30 – 8:45 a.m.

Effects of (Pro)renin Receptor Blockade on Glucose Metabolism in Mice on High Fat, High Carbohydrate Diet

Zulaykho Shamansurova [1, 2], Paul Tan [1, 3], Sandra Bisotto [4], Catherine Michel [1], Thi M.-D. Nguyen [4], Peter W. Schiller [4], Julie L. Lavoie [1, 5]

[1] CRCHUM, Montreal, Quebec
[2] Department of Physiology, Universiti of Montreal, Montreal, Quebec
[3] Department Biochemistry, University of Montreal, Montreal, Quebec
[4] IRSM, Montreal, Quebec
[5] Department Kinesiology, University of montreal, Montreal, Quebec

Introduction: The role of the renin-angiotensin system (RAS) in obesity-related glucose metabolism and insulin resistance has been demonstrated. However, the implication of the (pro)renin receptor (PRR), a novel member of the RAS, in these effects, especially in adipose tissue, have not been studied. In this study, we investigated the effects of (P)RR blocker (PRRB) administration on adipose tissue gene expression and glucose metabolism in mice fed a high–fat/high-carbohydrate diet (HF/HC).

Methods: C57BL/6 male mice at 12 weeks of age were placed on a HF/HC or normal diet (ND), where osmotic mini-pumps containing the PRRB or saline were implanted subcutaneously for 10 weeks. Body weight was assessed weekly. At the end of treatment, mice were euthanized by CO2 and fat tissues were separated, weighed and flash frozen. Blood was collected and plasma was flash frozen for future measurement of glucose, insulin and triglycerides. Insulin sensitivity was evaluated by glucose/insulin ratio (G/I). Gene expression for glucose transporters GLUT1 and GLUT4 were assessed by real-time PCR.

Results: As previously observed, (P)RRB administration lowered body weight and fat mass in HF/HC group. In mice on HF/HC, circulating levels of glucose, insulin and triglycerides were increased whereas G/I was decreased, which suggests that these mice may be insulin resistant. Conversely, mice receiving the (P)RRB had normalized levels of these circulating metabolites and the G/I was improved. Concomitantly, mice on a HF/HC had increased adipose tissue GLUT1 expression in all fat pads whereas GLUT4 was decreased. Interestingly, (P)RRB treatment significantly improved GLUT1 expression in perirenal and subcutaneous fat and increased GLUT4 in peri-gonadal fat.

Conclusions: Administration of the (P)RRB in mice can prevent obesity produced by a HF/HC. In addition, it improves adipose tissue GLUTs expression profile and glucose metabolism.

Oral Presentation 8:45 – 9:00 a.m.

Regulation of Smooth Muscle Cell Socialization by TGF-ß and OB-Cadherin

Balint B [1], Yin H [2], O'Neil C [3], Pickering G [4]

[1, 2, 3, 4] University of Western Ontario - Robarts Research Institute, London, Ontario

Introduction: Smooth muscle cell (SMC) crawling is critical for vascular repair. However, to impart function to the vessel, reparative SMCs must ultimately interact as sheets and layers of coaligned cells. This shift from individual to collective behavior is poorly understood.

Methods and Results: To elucidate cascades underlying SMC collectivization, we subjected HITC6 SMCs to serum-withdrawal and tracked cell patterning over 24 hours by time-lapse microscopy. Serum withdrawal induced a switch in contact behaviour from SMCs bumping off or crawling over/under each other to cell-cell adhesion, co-alignment, and co-migration. Quantitatively, the mean contact time between two SMCs increased significantly from 2.19 hours to 9.75 hours with serum-withdrawal ($p<0.001$). Electron microscopy of contacting cells revealed dense adherens junctions in contacting SMCs in serum-free conditions but less-developed junctions in SMCs in serum-supplemented cultures characterized by non-collective behaviour. Furthermore, immunostaining using a panel of cadherin-specific antibodies revealed a striking increase in the length of both N- and OB- cadherin-containing junctions in contacting SMCs after switching from individual behaviour (102±0.9 and 170±1.7 nm, respectively) to collectivization (183 and 344 nm, respectively, $p<0.001$). Co-immunostaining for vinculin and OB-cadherin revealed colocalization in collectively behaving SMCs, suggesting enrichment of vinculin in adherens junctions, in association with stabilized cell-cell adhesion. Time-lapse microscopy revealed that the frequency of SMC collectivization was inhibited in the presence of an N-cadherin blocking antibody (from 93.3% to 54.7% $p<0.05$) and more strikingly in the presence of an OB-cadherin inhibiting antibody (from 97.4% to 23.6% $p<0.001$), with a return to cells crawling under/over each other, rather than adhering. Finally, addition of TGF-β1 to collectivizing SMCs reduced cell contact time and the length of N- and OB-cadherin-containing junctions ($p<0.001$).

Conclusions: Motile SMCs can convert to collective cell behavior in an OB-cadherin and TGF-ß-dependent manner. These findings reveal a novel pathway for morphogenesis that could be critical to vascular repair and regeneration.

Oral Presentation 9:00 – 9:15 a.m.

Multipotent Mesoderm-Derived Stem Cells of the Aorta Form Vascular Smooth Muscle Cells

Steinbach S[1], Carruthers M[2], Keller G[2], Miller FD[2], Husain M[3]

[1, 2, 3] University of Toronto, Toronto General Research Institute, Toronto, Ontario

Background: Cells isolated from the neonatal rat aorta have been known to generate spheres in defined sphere-forming media. While sphere forming assays have been used to identify adult progenitor cells and are a method of assessing self-renewal and differentiation at the single cell level in vitro, the embryonic origins, self-renewal and role of aortic stem cells in health and disease are poorly understood.

Methods & Results: A mixing experiment with GFP+ and GFP- neonatal rat aortic spheres indicated that each sphere is clonally derived. Aortic spheres expressed Sox2, Nestin and Sca1 suggestive of a multi-potent progenitor. Spheres grown in suspension cultures were composed of highly polarized cells, and as such, they expressed high levels of gene transcripts involved in epithelial-to-mesenchymal transformation such as Slug, Snail and Twist. Consistent with their niche, rat aortic spheres expressed transcripts characteristic of cardiovascular stem cells, Tbx1 and Wt1. These cells differentiated into vascular smooth muscle cells (VSMCs) with the addition of TGF-β, and were also capable of forming neurons, Schwann cells and adipocytes with other defined growth factors. In hematopoietic cytokine media, rat aortic spheres differentiated into CD45+CD11b+ double-positive macrophages. Fate mapping studies with brachyury-cre mice crossed to floxed tdTomato reporter mice, indicated that murine aortic spheres were mesodermal in origin.

Conclusion: Transcriptional analysis and lineage tracing demonstrate that aortic spheres are mesodermal progenitors. This progenitor cell is capable of forming VSMC and cells of the peripheral nervous system, but may also generate hematopoietic cell types, such as macrophages. Further studies are needed to assess if this heretofore poorly described aorta-resident stem cell contributes to the formation of blood vessels during development, and or plays a role in aortic pathophysiology.

Oral Presentation 9:15 – 9:30 a.m.

The Functional Significance of an Intrinsic Cholinergic System in Murine Cardiomyocytes

Roy A[1], Rocha-Resende C[2], Fields WC[2], Guatimosim S[2], Prado VF[2], Prado MA[2], Gros R[3]

[1, 2, 3] University of Western Ontario, Robarts Research Institute, London, Ontario

Introduction: The cholinergic system plays an important role in regulating cardiac function. Our laboratory has shown that genetically-modified mice with globally reduced expression of the vesicular acetylcholine transporter (VAChT), the protein responsible for packaging acetylcholine (ACh), develop significant ventricular dysfunction despite the fact that parasympathetic innervation of ventricles is sparse. Recently, it has been proposed that rat cardiomyocytes themselves are able to synthesize and release ACh, which could amplify cholinergic activity in the heart.

Methods and Results: This study was designed to determine whether murine cardiomyocytes possess the machinery for de novo production of ACh and whether this machinery can play a functional role in regulating cardiac function. Adult ventricular cardiomyocytes were isolated and the expression of prototypical markers of the neuronal cholinergic system was confirmed through both immunoblotting and immunostaining. Neonatal cardiomyocytes were also cultured and treated with various drugs and cell surface area was analyzed to determine the hypertrophic response. Cardiomyocyte-derived ACh appeared to have a protective role because treatment with cholinesterase inhibitors was able to inhibit hypertrophy induced by chronic treatment with isoproterenol, an adrenergic agonist. Importantly, a more pronounced hypertrophic response was seen in cells treated with vesamicol, an inhibitor of VAChT. Furthermore, genetic deletion of VAChT restricted to cardiomyocytes (cVAChT) in vivo leads to cardiomyocyte hypertrophy. Additionally, the cVAChT mice display an increase in basal heart rate as well as several signs of cellular stress, suggesting a functional role for this system in vivo.

Conclusion: Together, our data suggest that murine cardiomyocytes are able to synthesize and secrete ACh and this intrinsic cholinergic system regulates heart function in vivo.

Oral Presentation 8:30 – 8:45 a.m.

Aortic Blood Pressure of Hypertensive Men During Short-Term Cold Exposure

Heidi Hintsala [1], Arno Kandelberg [2], Karl-Heinz Herzig [2, 3], Hannu Rintamäki [4, 2], Jouni Jaakkola [1, 5], Tiina Ikäheimo [1, 5]

[1] Centre for Environmental and Respiratory Health Research, University of Oulu, Oulu, Finland
[2] Institute of Biomedicine, Dpt of Physiology and Biocenter of Oulu, University of Oulu, Oulu, Finland
[3] Department of Psychiatry, Kuopio University Hospital, Kuopio, Finland
[4] Finnish Institute of Occupational Health, Oulu, Finland
[5] Institute of Health Sciences, University of Oulu, University of Oulu, Oulu, Finland

Background: Both short- and long-term exposure to cold increase blood pressure (BP) and may explain the higher wintertime cardiovascular morbidity and mortality observed in epidemiologic studies. The cold induced BP increase could be even more harmful to hypertensive people who have already an elevated BP. The aim of this study was to assess the effect of short-term cold exposure on aortic BP among hypertensive subjects.

Methods: We conducted a population-based recruiting of 51 untreated hypertensive and 32 normotensive men (age 55-65 yr) who underwent whole body cold exposure simulating everyday winter conditions in a subarctic climate (minus 10°C, wind of 3m/s, facial cooling while body was protected by winter clothing, duration of 15 min). Aortic BP was measured by radial artery applanation tonometry (AtCor®). Augmentation index (AI) and subendocardial viability ratio (SEVR) were computed from the aortic BP wave form.

Results: Cold exposure increased aortic BP from 129/93 to 161/107 mmHg (cold) in hypertensive and from 113/80 to 142/91 mmHg in normotensive subjects. An AI increase of over 50% was accompanied with a SEVR decrease of 5-6% during cold exposure in both test groups, denoting accelerated wave reflection and decreased myocardial oxygen supply/demand–relation. The aortic BP responses to cold were slightly higher among hypertensive than normotensive subjects.

Conclusions: Short-term cold exposure increases aortic BP and cardiac workload while myocardial oxygen demand slightly increases in relation to blood supply in both hypertensive and normotensive men. Due to the higher baseline BP and slightly higher responses to cold among hypertensive subjects the cold-induced rise in aortic BP may involve an aggravated risk of adverse cardiovascular health effects. Hence, hypertensive people need customized advice for appropriate cold-related health risk management.

Oral Presentation 8:45 – 9:00 a.m.

Brachial-Ankle Pulse Wave Velocity is the Index of Arterial Stiffness That Most Closely Correlates With Mitral Valve Indices of Diastolic Dysfunction

Rabkin S [1] and Chow B [1]

[1] University of British Columbia, Vancouver Hospital, Vancouver, British Columbia

Background: Hypertension is a major factor responsible for diastolic dysfunction and heart failure with preserved ejection fraction. The relationship between arterial stiffness and diastolic dysfunction is controversial. Furthermore, the preferred index of arterial stiffness in assessing diastolic dysfunction is unknown. The objective of this study was to determine the optimal assessment of arterial stiffness that relates to diastolic dysfunction.

Methods: Arterial stiffness was assessed by measurement of brachial-ankle pulse wave velocity (baPWV), carotid-femoral pulse wave velocity (cfPWV), ankle brachial index (ABI), pulse pressure (PP) and augmentation index (AI). Forty-one patients had recordings of systolic blood pressure (SBP), diastolic blood pressure (DBP) and indices of arterial stiffness. Patient characteristics were: average age of 68±11 years, 66% male, 73% hypertension, 22% coronary artery disease and 12% diabetes mellitus. Diastolic dysfunction was evaluated by echocardiographic indices of the ratio of peak early diastolic mitral valve velocity and the peak late diastolic velocity (E/A ratio), left atrial diameter (LAD) and left atrial volume index (LAVI). Left ventricular ejection fraction (LVEF) from echocardiograph was 63±5%; left ventricular mass was 79±21g/m2 for men and 83±21g/m2 for women.

Results: There was a significant correlation between baPWV and E/A ratio ($r=-0.311$, $p<0.05$). There was an inverse relationship so that higher arterial stiffness was associated with greater diastolic dysfunction. In contrast, there was no significant correlation between E/A ratio and cfPWV, PP, ABI or AI. SBP was significantly correlated with baPWV ($r=0.316$, $p<0.05$). After multivariate analysis, the relationship between baPWV and E/A ratio remained significant ($p<0.05$), independent of age, SBP and pulse pressure (PP). There were no correlations between any index of vascular stiffness and left atrial dimension or volume.

Conclusion: Increased arterial stiffness is an indicator and likely determinant of diastolic dysfunction, independent of a patient's age and blood pressure. baPWV is a better indicator of diastolic dysfunction than other indicators of arterial stiffness namely cfPWV, PP, ABI or AI. These results suggest that baPWV is of value to infer the presence of left ventricular diastolic dysfunction.

Oral Presentation 9:00 – 9:15 a.m.

How Does the Organization of Community Based Networks Foster Improvements in Health and System Outcomes?

Beatrice McDonough[1], Ricardo Angeles[2], Lisa Dolovich[2], Larry Chambers[3], Clare Liddy[3], Francine Marzanek[2], Gina Agarwal[2]

[1] City of Hamilton Public Health Services, Hamilton, Ontario
[2] Department of Family Medicine, McMaster University, Hamilton, Ontario
[3] Institut de recherche Élisabeth-Bruyère Research Institute, Ottawa, Ontario

Introduction: Hypertension is one of the most preventable causes of cardiovascular disease. The Cardiovascular Health Awareness Program (CHAP) is a community-based, primary care centered, peer-led, free of charge, cardiovascular disease risk assessment, and blood pressure monitoring program for community-dwelling older adults, demonstrating effectiveness in lowering cardiovascular morbidity (BMJ, 2011). CHAP is led by a local lead organization in partnership with other community organizations as a mechanism for community members to become more engaged in hypertension management including accessing local programs and resources.

Objective: To identify the effect of networks and partnership relationships within communities delivering CHAP related to the primary prevention of high blood pressure.

Methods: Design: Cross-sectional research **Setting:** 9 small to medium sized communities (population 10,000-60,000) in Ontario, Canada. **Participants:** Key agency representatives from CHAP local lead organizations (LLO), CHAP session participants and community partner organizations. **Instruments:** Using Butterfoss's Community Coalition Action Theory, the independent factors of the strength of the partnership, stage of coalition development, structure and strength of social network and community profile were measured using the Partnership Self-Assessment Tool (PSAT; Lasker et al.), the Coalition Effectiveness Inventory (CEI; Butterfoss et al.), Social Network Mapping and Community Profile/Environmental Scan to determine the effect on individual, community and system outcomes. Data outcome instruments included participant interviews, CHAP risk profile database, community partner interviews and document review of cardiovascular programs/practices and policies

Results: We found that some individual (age, self-efficacy, gender), community (Rurality Index of Ontario Score, duration of CHAP), and partnership level (CEI and some domains of PSAT, proportion of pharmacies involved) factors were predictive of change in health behaviours and community resource utilization.

Conclusions: The application of this theory and measurement tools utilized provide an unique visual approach to help researchers and community leaders better understand and improve partnerships, local networks and the overall collaborative process

Oral Presentation 9:15 – 9:30 a.m.

Epidemiological, Clinical, and Evolutionary Characteristics of Resistant Hypertension of the African Black Subject

Nobila Valentin Y[1], Millogo GRC[1], Yaméogo AA[1], Kagambèga LJ[1], Kologo KJ[1], Toguyeni BJY[1]

[1] University of Ouagadougou Teaching Hospital Yalgado Ouédraogo, Ouagadougou, Burkina Faso

Introduction: Refractory hypertension is defined as the absence of blood pressure control despite triple antihypertensive therapy in appropriate dose includes a diuretic and dietary measures. The objectives of our study were to determine the frequency of resistant hypertension in a population of hypertensive black Africans, describe its clinical and evolutionary aspects. Patients and methods: This is a descriptive study conducted from 1 May 2010 to May 31, 2012. We included consecutively 692 hypertensive known and followed (on treatment) for at least three months in two hospitals of the city of Ouagadougou (the cardiology department of the YO teaching hospital and Saint Camille medical center). Uncontrolled patients underwent correction of factors of poor control. Those with a blood pressure 140/90 mmHg benefit from ambulatory blood pressure (ABP). 135/85 the day and 120/70 at night were considered to have resistant hypertension.

Results: The refractory hypertension accounted for 27.6% of the hypertensive patients. It was clinically asymptomatic in 84.8% of cases. The average age was 56.4 years. The sex ratio was 1.7 for women. All patients had a high cardiovascular risk. The combination of spironolactone in the treatment helped control blood pressure in 47.8% of resistant hypertension. All patients had comorbidities. The evolution was mainly marked by the occurrence of stroke in 9% and myocardial infarction in 6.8% of cases. The deaths occurred in 3.6%.

Conclusion: The refractory hypertension is common in the Black population. Its consequences aremainly stroke and myocardial infarction. Mortality is high. Keywords: refractory hypertension; black subject ; Africa.

Oral Presentation 10:00 – 10:15 a.m.

A Novel C-Terminal ACE Inhibitor Reduces Angiotensin-Dependent Hypertension in Mice

Burger D[1], Montezano AC[2], Reudelhuber TL[2], Sturrock ED[2], Touyz R[3]

[1, 2, 3] University of Ottawa, Ottawa Hospital Research Institute, Ottawa, Ontario

Introduction: The somatic isozyme of angiotensin I-converting enzyme (ACE) is comprised of two distinct, zinc-dependent catalytic domains. Recently the two domains, termed the N-domain and C-domain on the basis of their proximity to the carboxy terminus of the enzyme, have been shown to exhibit substrate selectivity. Accordingly, angiotensin I is cleaved into angiotensin II almost exclusively by the C-domain, while bradykinin is cleaved and inactivated by both the N and C-domains. Classical ACE inhibitors achieve their effects by inhibiting both the N and C-domains and it is widely accepted that elevated bradykinin in patients on ACE inhibitors is responsible for side effects such as persistent cough and angioedema.

Methods and Results: In the present study we examined the effects of a novel C-domain selective ACE inihibitor (Lisinopril-Trp) in a mouse model of angiotensin-dependent hypertension utilizing transgenic mice expressing active human renin in the liver (LinA3). Compared with wild-type littermates, LinA3 mice displayed significant elevations in systolic blood pressure as determined by tail cuff sphygmomanometry (150±3 vs. 112±5 mmHg, $P<0.05$) and telemetry (163±3 vs. 112±2 mm Hg, $P<0.01$), and cardiac hypertrophy. Treatment with the non-selective ACE inhibitor lisinopril (1 mg/kg/day via osmotic minipump) for 2 weeks reduced systolic BP (tail cuff: 134±6 vs. 154±6 mm Hg, $P<0.05$; telemetry; 128±6 vs. 150±2, $P<0.01$) but had no significant effect on cardiac hypertrophy. Similarly, treatment with the C-domain selective ACE inhibitor Lisinopril-Trp (3.6 mg/kg/day via osmotic minipump) for 2 weeks reduced systolic BP (tail cuff: 131±5 vs. 154±8 mm Hg; telemetry: 139±7 vs. 161±2, $P<0.01$) without effect on cardiac hypertrophy.

Conclusion: Our data suggest that C-domain selective inhibitors of ACE reduce blood pressure in a mouse model of angiotensin-dependent hypertension. C-domain inhibitors have the potential to avoid undesirable effects on the bradykinin system common to non-selective ACE inhibitors and may represent a novel approach to the treatment of hypertension.

Oral Presentation 10:15 – 10:30 a.m.

T Regulatory Lymphocytes Counteract Angiotensin II-Induced Vascular Remodeling

Muhammad Oneeb Rehman Mian[1], Tlili Barhoumi[1], Marie Briet[1], Adriana Cristina Ene[1], Pierre Paradis[1] and Ernesto L. Schiffrin[1, 2]

[1] Vascular and Hypertension Research Unit, Lady Davis Institute for Medical Research
[2] Department of Medicine, Sir Mortimer B. Davis-Jewish General Hospital, McGill University, Montreal, Quebec, Canada

Background: T lymphocytes participate in the low-grade inflammatory response that contributes to vascular injury in hypertension. Angiotensin (Ang) II-induced hypertension and endothelial dysfunction are blunted in T and B lymphocyte deficient (rag1-/-) mice, and restored with reconstitution of T but not B lymphocytes. We hypothesized that adoptive transfer of Foxp3 deficient (Scurfy) T lymphocytes compared to wild-type cells will exacerbate Ang II-induced vascular damage in rag1-/- mice.

Design and methods: Eleven-week old male rag1-/- mice were injected i.v. with PBS containing 2% FBS (control), 10 x 106 wild-type or Scurfy pan T lymphocytes, and 2 weeks later underwent sham surgery or were infused with Ang II (490 ng/kg/min, s.c.) using mini-osmotic pump for 14 days (n=3-8). Systolic (SBP) and diastolic blood pressure (DBP) were measured by telemetry. Endothelial function and vessel structure were assessed in second order mesenteric arteries by pressurized myography.

Results: Ang II induced a similar 40 mmHg SBP rise in rag-1-/- mice for all treatment groups, but DBP rise was ~10 mmHg greater for wild-type and Scurfy T cell-injected mice than for control mice. Ang II impaired maximal vasodilatory responses to acetylcholine in resistance arteries from wild-type (54.0±5.9%) and Scurfy (50.1±13.3%) T cell-injected mice, but not in arteries from control mice (82.1±2.9%), compared to vessels from untreated mice. Ang II treatment induced hypertrophic remodeling in control mice and Scurfy T cell-injected mice, but not in wild-type T cell-injected mice (increase in media-to-lumen ratio: control 47%, Scurfy 50%, wild-type 21%, increase in media cross-sectional area: control 31%, Scurfy 21%, wild-type 9%). Ang II increased stiffness of small arteries from control mice and Scurfy T cell-injected mice but to a lower extent of vessels from wild-type T cell-injected mice.

Conclusion: These findings suggest that Foxp3+ T regulatory lymphocytes have a protective role against Ang II-induced vascular remodeling.

Oral Presentation 10:30 – 10:45 a.m.

Defective C-Myb Activity in Bone Marrow-Derived Cells Causes Decreased Aortic Systolic Blood Pressure

Shikatani E[1], Levy AS[2], Momen A, Billia[2] F, Bolz SS[2], Husain M[3]

[1, 2, 3] University of Toronto, Department of Laboratory Medicine and Pathobiology, Toronto, Ontario

Background: The c-Myb transcription factor regulates proliferation and differentiation of contractile vascular smooth muscle cells in adult mice and embryoid bodies respectively, the latter mediated by control over a specific hematopoietic and angiogenic progenitor. However, the role of c-myb in cardiovascular physiology has eluded genetic examination due to embryonic lethality of c-myb-/- mice from hematopoietic failure. To overcome this, we have used a mouse with a non-lethal point mutation in c-myb resulting in a hypomorphic allele (h) of c-myb with diminished activity.

Objective: To determine how c-myb is involved in blood pressure homeostasis.

Methods & Results: Previously we reported that 10-12 wk old male c-mybh/h mice have decreased aortic systolic blood pressure compared to c-mybwt mice (105.6±2.5 vs. 116.2±2.9 mmHg; n = 6/group; p=0.02). Utilizing perfusion myography, we found no baseline differences in vessel diameter or wall thickness and no contractile defects in mesenteric arteries from c-mybh/h mice. However, c-mybh/h arteries had decreased maximal diameter at higher pressures, and defective acetylcholine but not SNP-mediated vasodilation. Echocardiographic analysis of c-mybwt and c-mybh/h mouse hearts did not show any differences. To determine if low blood pressure in c-mybh/h mice is due to defects in vessel, cardiac or bone marrow (BM)-derived cells, we performed BM transplantation of c-mybwt or c-mybh/h BM into 5 week old c-mybh/h mice. Invasive hemodynamics on 12-week old male c-mybwtβh/h and c-mybh/hβh/h mice revealed that c-mybwt BM restored normal aortic systolic blood pressure in c-mybh/h recipient mice (117.5±2.6 vs. 104.2±3.7 mmHg; n = 4/group; p=0.03). Echocardiographic analysis of c-mybwtβh/h and c-mybh/hβh/h mice did not reveal any differences between the two groups.

Conclusions: The low blood pressure of c-mybh/h mice is due to defective c-myb activity in BM-derived cell populations. Future experiments will examine specific cell populations derived from BM that are known to be involved in blood pressure homeostasis.

Oral Presentation 10:45 – 11:00 a.m.

Role of Sphingosine-1-Phosphate Signalling in Human Resistance Artery Function

Hui S[1], Levy AS[2], Voigtlaender-Bolz J[3]

[1, 2, 3] University of Toronto, St. Michaels Hospital, Toronto, Ontario

Introduction: The term myogenic responsiveness (MR) describes the intrinsic ability of pre-capillary small arteries to adjust their resistance to blood flow to the actual level of transmural pressure. MR is the single most important regulator of total peripheral resistance (TPR); changes to MR have pronounced effects on tissue perfusion and systemic blood pressure. We have recently demonstrated that heart failure enhances resistance artery (RA) MR and hence, TPR, to compensate for the loss in cardiac output. The underlying mechanism is a tumour necrosis factor-alpha (TNFβ-dependent enhancement of sphingosine-1-phosphate (S1P) signalling, a key regulator of MR.

Methods and Results: Our findings in rodent models have identified and validated the TNFβS1P signalling axis as a therapeutic target to ameliorate the microvascular effects of heart failure. To clinically exploit this knowledge, we aim to translate our findings to human RAs. We hypothesized that S1P signalling critically regulates MR in human mesenteric and skeletal RAs. In the absence of reliable data in the literature, we first established the infrastructure and protocols necessary to reliably assess human RA function. Secondly, human RA S1P signalling was molecularly (PCR and Western blot) and functionally (pressure myography) assessed. Human mesenteric RA displayed dose-dependent constriction to phenylephrine (logEC50 = 5.9±0.3), pressure–induced vasoconstriction between 20 and 120mmHg and complete dilation to 10μmol/L acetylcholine, indicating normal smooth muscle and endothelial function. Exogenous S1P (1nmol/L-10μmol/L) induced dose-dependent vasoconstriction (logEC50 = 6.8±0.2). Manipulations of extracellular S1P levels through (i) addition of 10nmol/L S1P or (ii) inhibition of CFTR (CFTR is a necessary component of the S1P degradation pathway expressed in human RAs) significantly enhanced MR. Similar functional responses were confirmed in human skeletal muscle RAs.

Conclusion: By translating a key microvascular mechanism from rodents to humans, our results position S1P as a central regulator of human RA function and as a putative target for several disease processes.

Oral Presentation 10:00 – 10:15 a.m.

Reproducibility of Masked Hypertension

Alain Milot[1,3], Xavier Trudel[1,2], Chantal Brisson[1,2]

[1] Unité de recherche en santé des populations, CHU de Québec
[2] Département de médecine sociale et préventive, Université Laval, Quebec, Qc
[3] Département de médecine, Université Laval, Quebec, Qc

Objective: To examine masked hypertension (MH) reproducibility over time, using a population-based cohort of white collar workers assessed periodically over 5 years.

Methods: White-collar workers were recruited from three public organizations. Blood pressure (BP) was measured at the workplace using Spacelabs 90207 for manual measurements (mean of the first three readings taken by a trained assistant) followed by ambulatory measurements (mean of every other reading obtained during the working day) at baseline, after 3 years and after 5 years. MH was defined as manual BP less than 140/90 mmHg and ambulatory BP 135/85 mmHg and higher. Analyses were restricted to participants who were assessed at all three measurement period.

Results: BP measurements were obtained from 1358 participants (551 men and 807 women, mean age, 44 years). Men were older than women, had a higher BMI, engaged in less physical activity, were more educated and had a higher family income. Men drank more alcohol than women while smoking prevalence was higher for women. Both masked and sustained hypertension prevalence increased over time while normotension prevalence decreased. MH prevalence was approximately 2 times higher than sustained hypertension across all three measurement periods. In men, 39.8% of masked hypertensives still had MH after five years while 19.4% had developed sustained hypertension. In women, 46.1% of masked hypertensives still had the condition after follow-up while 17.1% had sustained hypertension. Compared with men, a larger proportion of normotensive women remained as such at the end of the study (74.9 vs 86.9%).

Conclusion: Most subjects with MH remained hypertensives after 5 years.

Oral Presentation 10:15 – 10:30 a.m.

A Systematic Review of Web-Based Interventions in Reducing Blood Pressure

Liu S[1], Eysenbach G[2], Thomas S[2], Brooks D[2], Nolan R[3]

[1, 2, 3] University of Toronto, Toronto General Hospital, Toronto, ON

Background: Lifestyle interventions such as exercise and a healthy diet are recommended for reducing blood pressure (BP). The Internet may hold the potential to deliver effective lifestyle interventions without overtaxing health care resources. The purpose of this review was to

1) examine the efficacy of web-based interventions in reducing BP, and

2) identify trial attributes that appear to be mediators or moderators of BP reductionMethod: MEDLINE, Pubmed, Embased and Cochrane Library were searched from 2000 to June 2012 using the following key words: Web-based, Internet, blood pressure and hypertension. The effect size for the magnitude of BP change was calculated using Cohen's formula.

Results: The search strategy identified 867 studies, of which 16 studies met the selection criteria. The intervention length ranged between 8 weeks to 12 months. The average reduction of systolic and diastolic BP across the 16 studies was -6.3 ±3.0 mmHg and -3.4 ±2.1 mmHg, respectively. In comparison to Control, 10 out of the 16 studies reported a significant reduction in both systolic and diastolic BP, while 2 studies only reported significant systolic BP decrease. The mean effect size for systolic and diastolic BP was small, 0.41 and 0.17, respectively. Web-based interventions that targeted multiple behavioural targets such as modifying both exercise and diet had a greater chance in reducing BP than those studies that targeted either exercise or diet alone (85% vs. 33%).

Conclusion: A theoretically grounded, evidence-based e-counseling intervention for BP reduction is still at an early phase of development. There is modest evidence of significant BP reduction using an e-based intervention. Components of e-counseling, such as targeting multiple behaviours and sending proactive messages, may improve efficacy.

Oral Presentation 10:30 – 10:45 a.m.

The HARMONY Study: Secondary Results From a Randomized Controlled Trial

Blom K[1], How M[1], Dai M[2], Baker B[3], Irvine J[4], Abbey S[3], Abramson BL[5], Myers M[1], Perkins N[1] and Tobe SW[1]

[1] Sunnybrook Health Sciences Centre, Department of Medicine, Toronto Ontario, Canada
[2] Queen's University, Kingston Ontario, Canada
[3] University Health Network, Department of Psychiatry & University of Toronto, Department of Psychiatry, Toronto Ontario, Canada
[4] York University, Department of Psychology, Toronto Ontario, Canada
[5] St. Michael's Hospital, Department of Medicine, Toronto Ontario, Canada

Introduction: With over 1 in 5 adults affected worldwide HTN is a leading risk factor for preventable CVD. Stress has been associated with increased CV risk and stress management is a recommended intervention for hypertensives. HARMONY was a prospective wait-list RCT designed to test whether mindfulness based stress reduction (MBSR), a standardized group stress reduction therapy, could lower BP among stage-1 unmedicated hypertensives. The primary analysis has previously been reported. Secondary results are reported here.

Methods: ABPM determined study eligibility; mean daytime ABP > /= 135/85 mm Hg or 24HR ABP >/= 130/80 mm Hg. Subjects were randomly assigned to either Early or Delayed. Early received MBSR within 4 weeks of baseline; Delayed began an 8 week waitlist period within 4 weeks of baseline. Secondary outcome measures were mean awake, night-time and 24HR ABP within each subject from baseline to study close out. 101 adults aged 20 -75 yrs. were enrolled; 38 males, 63 females. Mean age was 55 + 11 yrs. Average 24HR ABP was 134.7/82.0 mmHg ± 7.9/5.8 and average awake ABP was 140.5/86.8 ± 7.7/6.3 mmHg.

Results: RANOVA (Group X Time) revealed two significant secondary within-group effects. From Baseline to Post MBSR, both 24 HR and Awake SBP demonstrated significant reductions: -1.8 mmHg ($p<0.05$) and -2.1 mmHg ($p<0.01$), respectively. Overall, there appeared to be a general downward trend for all ABP parameters.

Conclusions: Two significant reductions in ABP and an overall downward trend suggest that MBSR may be exerting its effect through other mediating pathways. Next steps include evaluating associations between change in psychosocial functioning and change in BP

Oral Presentation 10:45 – 11:00 a.m.

Development and Validation of a Public Health Questionnaire to Better Understand Barriers and Facilitators of Adherence to Medication and Lifestyle

Bahati R[2], Gwadry-Sridhar F[1], RatzkiLeewing A[2]

[1, 2] Lawson Health Research Institute, Western University, London, Ontario

Background: Over 20% of Canadians have diagnosed hypertension (HTN). Despite advances in medication treatment, 21% of HTN cases remain uncontrolled. A primary reason for inadequate BP control is non-adherence to medication. To better understand the reasons for this we developed and validated a questionnaire to meaningfully address factors relevant to health surveillance.

Objective: Validate a questionnaire to be used nationally to inform on the impact of HTN on individuals and families by assessing health behaviours, knowledge, attitudes, barriers to care, adherence, symptom control, self-management; and gain knowledge about chronic disease management interventions in Canada.

Method and Results: Questionnaire items were determined by an expert steering committee and literature review. A subset of patients and nurses evaluated the content validity. We administered the questionnaire to 105 patients at two time points, recruited from 3 hospital sites.

We assessed the psychometric properties of the questionnaire and conducted qualitative interviews with 105 patients. The questionnaire consisted of 55 items divided into 17 themes. Test-retest reliability identified 46 items measuring the instrument's stability over a two-week period. The structural domains of the questionnaire were determined using exploratory factor analysis. Results: Of the 46 items, principle components analysis revealed a 9-factor solution, accounting for 63% of the total variation. This resulted in a validated an instrument with 36 items across 9 domains. The resulting survey can be used to capture salient aspects of self-management and social support that may facilitate health behavior modification in HTN.

Conclusion: In Canada, no comprehensive national questionnaire existed prior to this, to obtain detailed information about hypertensive patient preferences and behaviours. Information elicited by a validated, evidence-based questionnaire is crucial to better understand non-adherence in order to tailor optimal treatment.

Poster Presentation 11:30 a.m. – 2:00 p.m.

P12 - Endothelin-1 Expression In Young and Old Rat Aorta

Nguyen H [1], Rätsep MT [2], Adams MA [2], Di Wang H [3]

[1, 2, 3] Brock University, St. Catharines, Ontario

Objective: Emerging evidence indicates that the vascular adventitia is a dynamic tissue and may play a critical role in the development and progression of vascular disorders. Endothelin-1 (ET-1) is a potent vasoactive peptide, mediating both vascular contractile and growth responses. Our previous research has shown that angiotensin II can induce ET-1 production and its ETA and ETB receptor in cultured adventitial fibroblasts. The objective of the current study is to examine age related changes in the ET system in adventitial fibroblasts in vivo.

Methods: Male Sprague-Dawley rats aged 15 and 80 weeks were used. After being anesthetized and euthanized by exsanguinations, thoracic aortas were isolated, formalin fixed, embedded in paraffin, and then serially sectioned. The thickness of the vessel wall was examined by microscope. The expression of ET-1, its main synthesizing enzyme, endothelin converting enzyme (ECE)-1, and ET¬A and ETB receptors were determined by immunofluorescence staining.

Results and Conclusion: Compared to the aorta from 15 week old rats, aorta sections from 80 week old rats display disorganized elastic laminas, thicker medial layer and an expansion of the adventitia. In the 15 week old rat aortas, staining of ET-1 was present throughout the vascular wall. Although ETA receptor expression was observed in both the adventitial and medial layer, the majority of its expression was confined to the medial layer. ECE-1 and the ETB receptor were mainly localized in both the endothelium and adventitia. ET-1 expression in the adventitia, but not the ECE-1, ETA or ETB receptors, decreased by a half in the aortas from the old age group. Together, these findings demonstrate that the adventitia contributes to ET-1 production and suggests the possibility for the adventitia to contribute to the progression of ET-related vascular disorders.

Poster Presentation 11:30 a.m. – 2:00 p.m.

P13 - Endothelin-1-Induced Oxidative Stress and Inflammatory Cell Infiltration Contribute to High-Fat Diet Induced-Atherosclerosis in Apolipoprotein E Knockout Mice

Paradis P [1], W. Li M [2], Schiffrin EL [3]

[1, 2, 3] Sir Mortimer B. Davis-Jewish General Hospital, Lady Davis Institute for Medical Research, Montreal, Quebec

Background: Endothelin (ET)-1 plays an important role in generation of reactive oxygen species (ROS) and inflammation in the vasculature. ET-1has been implicated in the pathogenesis of atherosclerosis since plasma and tissue ET-1 are increased in human and animal models of atherosclerosis. We observed that ET-1 overexpression exacerbates high-fat diet (HFD)-induced atherosclerosis in apolipoprotein E knockout (apoE-/-) mice. We hypothesized that ET-1-induced ROS and inflammation contribute to the development of atherosclerosis.

Design and methods: Eight-week-old male transgenic mice overexpressing preproET-1 in the endothelium (eET-1), apoE-/-, eET-1/apoE-/- and wild type mice were fed a HFD for 8 weeks. Aortic atherosclerotic lesions were quantified using Oil Red O staining. ROS production using dihydroethidium staining and monocyte/macrophage and T cell infiltration using immunofluorescence with MOMA-2 and anti-CD4 antibodies, respectively, were determined in perivascular fat, media and plaques in ascending aortic sections.

Results: eET-1/apoE-/- mice presented 3.8-fold more atherosclerotic lesions in whole aorta compared to apoE-/- ($P<0.01$). ET-1 overexpression caused 2.6-, 1.9- and 1.9-fold increase in ROS production in perivascular fat, media and plaques of apoE-/- mice, respectively ($P<0.05$). ET-1 overexpression increased monocyte/macrophage infiltration by 5- and 8-fold in perivascular fat and media of apoE-/- mice, respectively ($P<0.05$). CD4+ T cell infiltration was observed in perivascular fat and plaques of 3 and 5 of 6 eET-1/apoE-/- compared to 0 and 1 of 6 apoE-/- mice, respectively ($P<0.05$).

Conclusions: These results suggest that ET-1 plays an important role in progression of atherosclerotic lesions by increasing the oxidative stress and monocyte/macrophage and T cell infiltration in the atherosclerotic aorta, including perivascular fat.

Poster Presentation 11:30 a.m. – 2:00 p.m.

P14 - Aldosterone-Induced Small Artery Endothelial Dysfunction, Inflammation and Oxidative Stress are Blunted in Angiotensin Type 1a Receptor Knockout Mice

Paradis P[1], Briet M[2], Barhoumi T[2], Mian MOR[2], Coffman TM[2], Schiffrin EL[3]

[1] Sir Mortimer B. Davis-Jewish General Hospital, Lady Davis Institute for Medical Research, Montreal, Quebec

Background: Aldosterone induces hypertension, endothelial dysfunction, vascular inflammation and oxidative stress. Recent in vitro studies suggest that there may be cross-talk between angiotensin II and aldosterone pathways. We hypothesized that in vivo vascular effects of aldosterone require a functional angiotensin II type 1a receptor (Agtr1a).

Design and methods: Eight to 10-week old male agtr1a knockout (agtr1a-/-) and wild-type mice were implanted s.c. with a dummy pump or infused with aldosterone (600 µg/kg/d, s.c.) using a mini-osmotic pump for 14 days while receiving 1% saline in the drinking water (n=8-10). Systolic blood pressure (SBP) was measured by telemetry. Endothelial function, and reactive oxygen species (ROS) production were assessed in mesenteric arteries using pressurized myography and dihydroethidium staining, respectively. Levels of collagen by Sirius red staining and fibronectin, VCAM-1, and MCP-1 by immunofluorescence were determined in aortic sections.

Results: Aldosterone-induced a 15 mmHg higher SBP rise in agtr1a-/- compared to wild-type mice ($P<0.01$). Maximal vasodilatory responses to acetylcholine in mesenteric small arteries were similar in agtr1a-/- and wild-type mice. Aldosterone reduced maximal vasodilatory responses to acetylcholine in wild-type mice by 48% ($P<0.05$) whereas there was no effect in agtr1a-/- mice. Aldosterone increased ROS production 2-fold in mesenteric arteries of wild-type mice ($P<0.05$) whereas it had no effect in agtr1a-/- mice. Aldosterone increased VCAM-1 (1.8-fold, $P<0.05$), MCP-1 (2.7-fold, $P<0.05$), fibronectin (3-fold, $P<0.01$) and collagen (3.9-fold, $P<0.05$) in aorta of wild-type but not in agtr1a-/- mice.

Conclusion: Aldosterone requires functional Agtr1a to induce small artery endothelial dysfunction and vascular oxidative stress, inflammation and fibrosis.

Poster Presentation 11:30 a.m. – 2:00 p.m.

P15 - Placental Growth Factor Deletion Alters Uterine Angiogenesis During Early Pregnancy in Mice

Rätsep M[1], Adams MA[2], Croy AB[3]

[1, 2, 3] Queen's University, Kingston, Ontario

Introduction: Preeclampsia (PE), a pregnancy disorder involving pathologically elevated blood pressure and proteinuria, affects approximately 2-8% of all human pregnancies, and is the leading cause of fetal morbidity and mortality worldwide. Although the precise causes of PE are unknown, recent evidence has linked the angiogenic signalling molecule placental growth factor (PGF) to early steps in pathogenesis of this syndrome. Numerous studies report that reduced circulating PGF and/or elevated soluble fms-like tyrosine kinase-1 (sFlt-1), the antagonist of PGF, predict the onset of PE with greater than 90% sensitivity and specificity. However, the precise role of PGF in regulating uteroplacental angiogenesis has not been addressed. During early pregnancy, uterine natural killer (uNK) cells, a specialized subset of leukocytes, are a major source of PGF and play a large role in regulating uterine angiogenesis.

Methods and Results: We examined the structure of uterine vasculature of PGF null mice during early pregnancy using whole mount in situ immunofluorescence of uteri from embryo implantation to the beginning of placental development. Angiogenic signalling was assessed by studying blood vessel structure. Blood vessels and uterine leukocytes were identified using fluorescently-tagged antibodies directed against CD31 and CD45, respectively. PGF null mice had normal sized litters and implantation sites similar to controls, however uterine angiogenesis differed. PGF null vessels appeared wider, and less defined compared to controls. Image analysis revealed fewer branch points and wider vessels compared with controls. Uterine leukocytes appeared much larger in PGF null mice compared to controls, consistent with previously reported impairment of uNK cell division in this strain.

Conclusion: Preliminary radiotelemetric studies in pregnant PGF null mice revealed elevated mean arterial pressure across gestation, suggesting its further study will be valuable in understanding the pathogenesis of PE.

Poster Presentation 11:30 a.m. – 2:00 p.m.

P16 - Transglutaminase 2 is a Regulator of Angiotensin II-Induced ERK1/2 Activation in Vascular Smooth Muscle Cells

Yohann Rautureau [1], Pierre Paradis [1], Ernesto L. Schiffrin [1,2]

[1] Vascular and Hypertension Research Unit, Lady Davis Institute for Medical Research
[2] Department of Medicine, Sir Mortimer B. Davis-Jewish General Hospital, McGill University, Montreal, Quebec

Introduction: In essential hypertension, angiotensin (Ang) II induces arterial remodeling that is dependent on the activation of ERK1/2 pathway in vascular smooth muscle cells (VSMC). Transglutaminase 2 (TG2), a multifunctional protein with an emerging role in vascular pathophysiology, has been implicated in arterial remodeling. Beside its effect on extracellular matrix, TG2 has a GTPase activity and as such, could potentially be a signaling molecule. We hypothesized that TG2 mediates Ang II-induced ERK1/2 activation in VSMC during arterial remodeling.

Methods and Results: To determine the role of TG2 in Ang II type 1 receptor (AT1R) signaling, His6 tagged-TG2 was overexpressed in the human embryonic kidney (HEK) 293 cell line stably overexpressing HA tagged-AT1R. Protein and phosphorylation levels were determined by Western blot (WB). When stimulated for 2-60 min, TG2 overexpression potentiated 100 nM Ang II-induced ERK1/2 phosphorylation compared to control cells overexpressing green fluorescent protein (GFP, $P<0.05$, $n=4$). Maximal potentiation was observed after 2 min at which time TG2 transfected cells showed an increase of 64±31% compared to GFP transfected cells. The role of TG2 in Ang II-induced phosphorylation of ERK1/2 was studied by TG2 siRNA knockdown in mouse VSMC line (MOVAS). TG2 siRNA decreased TG2 expression 83±5% compared to control siRNA-treated cells ($n=4$) in absence of significant modification of cell viability ($n=3$). Ten min stimulation with 1 and 100 nM Ang II increased ERK1/2 phosphorylation 38±18% and 60±29%, respectively, and this was prevented by TG2 knockdown ($P<0.01$). Using WB, HA-AT1R dimer/monomer ratio was increased by co-expression of His6-TG2 compared to HA-AT1R expressed alone.

Conclusions: These results suggest that TG2 mediates ERK1/2 activation by Ang II through a mechanism involving TG2-induced AT1R dimerization. Overall, our results demonstrate that TG2 is involved in the activation of ERK1/2 in response to Ang II and could participate in arterial remodeling induced by Ang II.

Poster Presentation 11:30 a.m. – 2:00 p.m.

P17 - Mapping of Chromosome 2 Regions Linked to Vascular Inflammation Using Congenic Rats

Asia Rehman [1], Naoki Yamamoto [1], Muhammad Oneeb Rehman Mian [1], Tlili Barhoumi [1], Anne E. Kwitek [3], Pierre Paradis [1], Ernesto L. Schiffrin [1,2]

[1] Vascular and Hypertension Research Unit, Lady Davis Institute for Medical Research
[2] Department of Medicine, Sir Mortimer B. Davis-Jewish General Hospital, McGill University, Montreal, Quebec
[3] Department of Internal Medicine University of Iowa, IA, USA.

Background: We demonstrated that introgression of chromosome 2 (Chr2) from normotensive Brown Norway rats (BN) into hypertensive Dahl salt sensitive (SS) background (consomic SB2) reduced vascular inflammation and restored regulatory T lymphocyte (Treg) function. We hypothesized that Chr2 genes can be mapped using congenic Dahl rats containing portions of BN Chr2.

Methods: Twelve week old male BN, SS, SB2, congenic (SB)A, SBB and SBE rats were studied. Systolic blood pressure (SBP) was measured by telemetry. Spleen Treg (CD4+CD25hi) and CD4+CD25- T lymphocytes were isolated, characterized by FACS, and cultured. Interferon gamma (IFN-β, tumor necrosis factor (TNF)-β interleukin (IL)-6, IL-10 and IL-17 were measured by immunoassays in culture media. Aortic collagen content was determined by Sirius red staining.

Results: SS, SB2 and SBE exhibited higher SBP compared to BN, SBA, and SBB ($P<0.05$). The % of CD4+CD25- was higher in SS, SB2 and SBE (~16 %) compared to BN, SBA and SBB (~12%, $P<0.05$). The % of Treg was lower in SBA (2%) compared to SS and SB2 (3%, $P<0.05$). CD4+CD25- secretion of TNF-β IFN-β and IL-6 was lower in SS and SBB (≤141, 1428 and 13 pg/105 cells, respectively, $P<0.05$), and unchanged in SB2 and SBE (~320, 2350 and 50 pg/105 cells, respectively) compared to BN (458, 3552 and 57 pg/105 cells, respectively). Treg IL-10 and IL-17 production was increased in SB2 (9597 pg/105 cells), and SS and SB2 (>90 pg/105 cells), respectively ($P<0.05$) and unchanged in congenic rats (~2540 and 23 pg/105 cells, respectively), compared to BN (2497 and 9 pg/105 cells). Aortic collagen was increased 3-folds in SS, 1.7-folds in SB2 and SBB ($P<0.05$) and unchanged in SBA and SBE compared to BN.

Conclusion: These results suggest that the fragment of BN Chr2 in SBE rats contain genes involved in the regulation of vascular inflammation.

Poster Presentation 11:30 a.m. – 2:00 p.m.

P18 - The Role of Adipose Tissue (Pro)Renin Receptor Expression in Glucose Homeostasis

Zulaykho Shamansurova [1, 2], Basma A.-M. Ahmed [1, 2], Sonia Kajla [1], Julie L. Lavoie [1, 3]

[1] CRCHUM, Montreal, Quebec
[2] Department of Physiology, Universiti of Montreal, Montreal, Quebec
[3] Department Kinesiology, University of Montreal, Montreal, Quebec

Introduction: The relationship between the renin-angiotensin system (RAS) and glucose metabolism is well known. However, the role of a newly discovered member of the RAS – the (Pro)Renin Receptor [(P)RR] is still unclear. Given that we have found that mice deficient in the (P)RR specifically in adipose tissue [AP2-(P)RR-KO] have lower and leaner body masses, we hypothesized these mice would have improved glucose homeostasis.

Methods: In 7 AP2-(P)RR-KO and 6 wild-type (WT) male mice on regular chow, body weight was measured and body composition was assessed by Echo-MRI. Carbohydrate metabolism was evaluated by oral glucose tolerance test (OGTT) following an overnight fast and using a dose of 5g/kg of glucose. Blood samples were collected by the tail vein for the measurement of glycemia and insulinemia. Area under the curve for glucose (AUCg) and insulin (AUCi) were calculated. Basal (BIS) and stimulated (SIS) insulin sensitivity were estimated by calculating the glucose/insulin ratio following fasting and 30 minutes of OGTT, respectively.

Results: The KO mice body weight as well as fat and lean body masses were significantly lower than WT littermates. There was no difference in fasting glycemia between groups at baseline but glucose levels were significantly higher in KO mice at 30, 45, 60, 120 minutes of OGTT. As a result, AUCg (P<0,01) was higher and AUCi tended to be lower. In addition, BIS and SIS were higher in KO mice which suggests that these mice are glucose intolerant.

Conclusions: Although KO mice have lower body weight then WT, they have poor glucose tolerance as observed in OGTT results. This thus suggests that adipose tissue (P)RR may have a role in the regulation of glucose metabolism.

Poster Presentation 11:30 a.m. – 2:00 p.m.

P19 - Susceptibility to Vascular Calcification Differs by Region: Role for Phosphate, Magnesium and Vitamin D

Shobeiri N [1], Burgesson B [2], Jones GG [2], Holden RM [2], Adams MA [3]

[1, 2, 3] Queen's University, Kingston, Ontario

Introduction: Vascular calcification (VC) is accelerated in chronic kidney disease (CKD) and is a risk factor for cardiovascular disease and mortality. Tissue specific factors (phosphate and magnesium transporters) as well as extra-vascular factors (hormones: fibroblast growth factor 23 and vitamin D3) are actively involved in the development of CKD induced VC. We hypothesize that there are regional differences in the susceptibility of vascular beds to VC.

Methods and Results: Spontaneously hypertensive and Sprague Dawley rats were given a high adenine diet (0.25%) to induce CKD. VC was assessed by quantification of tissue calcium and phosphate. We have developed an ex-vivo model to assess susceptibility to calcification. Vascular segments were excised and incubated in DMEM with high phosphate (3.8mM). Both SHR and SDs with CKD developed VC but with different regional susceptibilities. Specifically, in vivo, abdominal aorta, renal, and iliac arteries were more susceptible to VC than thoracic aorta and carotids. Vessels in vitro had a different pattern of calcification. That is, tissue calcium (nmol/mg) in aortic arch (73.4±30.7), mesentery (75.6±42.1) and renal arteries (84.8±29.9) were significantly less than thoracic (137.6±45.2) and abdominal aorta (133.4±49.3). In vitro, magnesium (1.2mM and 2.5mM) attenuated calcification by 49% and 93% respectively. In vitro, vitamin D (10nM and 1uM) decreased calcification by 55% and 51% respectively. In contrast, phosphaturic hormone FGF-23 in vitro did not alter calcification.

Conclusion: Regional susceptibility to VC likely depends on differences in vascular factors (phosphate and magnesium) and extra-vascular factors (vitamin D).

Poster Presentation 11:30 a.m. – 2:00 p.m.

P20 - Potential Implication of Adipokines in (Pro)Renin/Renin Receptor Blocker Effects on Weight Gain

Paul Tan [1,2], Zulaykho Shamansurova [1,3], Catherine Michel [1], Thi M.-D. Nguyen [4], Peter W. Schiller [4], Jolanta Gutkowska [1,5], Julie L. Lavoie [1,6]

[1] Centre de Recherche du Centre Hospitalier de l'Université de Montréal (CRCHUM)
[2] Department of Biochemistry,
[3] Physiology,
[4] Laboratory of Chemical Biology and Peptide Research, Institut de Recherches Cliniques de Montréal, Montreal, Quebec, Canada
[5] Medecine
[6] Kinesiology of the Université de Montréal

Introduction: Little is known about the regulation of renin and the (pro)renin/renin receptor [(P)RR] in adipose tissue. The objective of this study was to elucidate the regulation and role of this receptor in a mouse obesity model.

Methods: Mice were placed on a normal or high-fat/high-carbohydrate (HF/HC) diet for 10 weeks and then sacrificed to collect the different adipose tissue depots. To evaluate the role of the (P)RR in obesity, 2 groups received the (P)RR blocker in addition to the different diets. Gene expression was assessed by Real-time PCR and circulating adipokines using a mouse array. The effect of obesity on the (P)RR was confirmed by Western Blot.

Results: Renin and (P)RR expression were detected in all adipose tissue. Although we found (P)RR expression to be increased by the HF/HC diet only in peri-renal, subcutaneous and brown fat pads, renin expression was significantly elevated in all sites. Moreover, renin was unaffected by the blocker while the (P)RR was significantly decreased in subcutaneous fat. Interestingly, mice receiving the blocker on either diet gained less weight than those receiving saline. As expected, leptin expression was significantly increased by the HF/HC diet in all white adipose tissue and this effect was completely abolished by the blocker. Similar results were observed for resistin and adiponectin in subcutaneous and brown fat while they were found to be decreased by the HF/HC diet in peri-gonadal and peri-renal fat respectively with (P)RR blocker having little to no effect on these parameters in visceral fat. Circulating leptin was modified in a similar fashion to what was observed in mRNA expression. Conversely, circulating resistin and adiponectin were respectively increased and tended to decrease with obesity.

Conclusions: To our knowledge, this is the first report of any implication of the (P)RR in the development of obesity which may be a novel therapeutic target.

Poster Presentation 11:30 a.m. – 2:00 p.m.

P21 - Effect of High Salt Feeding on Renal Blood Flow Autoregulation and Pathology in the Spontaneously Hypertensive Rat

Yum V [1], Lu C [2], Ask K [2], Dickhout GJ [3]

[1,2,3] McMaster University, St. Joseph's Healthcare Hamilton, Hamilton, Ontario

Introduction: The myogenic response contributes to renal blood flow autoregulation where increased luminal pressure induces vaso-constriction. We studied the spontaneously hypertensive rat (SHR), a model of essential hypertension, and the Wistar-kyoto rat (WKY) its normotensive control.

Methods and Results: We hypothesized that high salt feeding would diminish the myogenic response and this would lead to hypertension-induced renal pathology in the SHR. SHRs and WKYs were fed either a high salt (8% NaCl) or a low salt (0.4% NaCl) diet for 4 weeks. The myogenic response was assessed in the arcuate artery of the left kidney, while renal pathology was also assessed. On low salt, the arcuate arteries of SHR and WKY demonstrated a myogenic response. The SHR showed a significantly greater myogenic response than WKY. The myogenic response was significantly reduced with high salt feeding in both SHR and WKY. To determine the mechanism of myogenic constriction, vessels were treated with an AT1 receptor antagonist (Irbesartan), a L-type calcium channel antagonist (Nifedipine), and a superoxide scavenger (Tempol). Nifedipine significantly decreased the myogenic response in both SHR and WKY, indicating the dependence of myogenic constriction on L-type calcium channels. Tempol did not affect the myogenic response in either high salt or low salt fed WKYs. In SHR, Tempol reduced the myogenic response on the low salt diet, indicating dependence of the exaggerated myogenic response in SHRs on superoxide generation. Irbesartan, partially decreased the myogenic response in the SHR, while it did not show an effect in the WKY.

Conclusion: High salt feeding did not significantly increase total 24 hour protein excretion in SHR or WKY. However, high salt feeding increased glomerular sclerosis in the SHR and the WKY. These results indicate that the SHR have an exaggerated myogenic response that is partially dependent on superoxide generation which may protect the kidney from high pressure-induced renal pathology.

Saturday, October 27, 2012

Saturday, October 27, 2012

11:30 a.m. – 2:00 p.m.

Clinical/Outcomes/ Population Research Track

Poster Session III

Note: Poster presentations will take place from 12:00 to 1:00 p.m.

Oral Presentation 8:30 – 8:45 a.m.

Calpain Activation Contributes To High Glucose-Stimulated Endothelial Cell Injury and Endothelial Dysfunction in Diabetic Mice

Chen Bainian[1, 2], Tang Futian[1, 2], Shan Limei[1, 2], Zhao Qing[1, 2], Inga Cepinskas[1], Gediminas Cepinskas[1], Tianqing Peng[1, 2, 3]

[1] Lawson Health Research Institute, University of Western Ontario, London, Ontario
[2] Department of Medicine, University of Western Ontario, London, Ontario
[3] Department of Pathology, University of Western Ontario, London, Ontario

Goals: The present study was to investigate the role of calpain in mitochondrial reactive oxygen species (ROS) generation in endothelial cells and vascular dysfunction in diabetic mice.

Methods: Endothelial cells cultured from human umbilical vein (HUVEC) were stimulated with high glucose. Type I diabetic OVE 26 mice and type II diabetic db/db mice with calpastatin over-expression (OVE26/CAST and db/db-CAST) were generated, respectively. Type I diabetes was also induced in both wild-type and Tg-CAST mice by injection of streptozocin. The endothelium-dependent relaxation of aortic ring was measured.

Results: High glucose significantly increased calpain activity and ROS generation in mitochondria of HUVEC. Pharmacological inhibition of calpain or over-expression of calpastatin abrogated high glucose-induced intracellular ROS production, mitochondrial ROS generation and apoptosis in HUVEC. Inhibition of calpain also restored nitric oxide production in high glucose-stimulated HUVEC. In diabetic mice, calpain activity was induced in aortic vessels, which correlated with an increase in ROS production and protein tyrosine nitration. Over-expression of calpastatin prevented calpain activity, reduced ROS production and inhibited protein tyrosine nitration in diabetic mice. Aortic ring segments from diabetic mice exhibited a significant reduction in vascular relaxation to acetylcholine, which was reversed by over-expression of calpastatin in Tg-CAST, OVE26/CAST and db/db-CAST mice.

Conclusions: This study has demonstrated a critical role of calpain in mitochondrial ROS generation, which contributes to apoptosis and reduces the availability of nitric oxide in endothelial cells during hyperglycemia. Thus, over-expression of calpastatin inhibits ROS production and ameliorates vascular dysfunction in diabetic mice.

Oral Presentation 8:45 – 9:00 a.m.

Endothelin-1-Induced Oxidative Stress and Inflammatory Cell Infiltration Stimulate The Development of Aneurysms in High-Fat Diet-Fed Apolipoprotein E Knockout Mice

Paradis P[1], W. Li M[2], Schiffrin EL[3]

[1, 2, 3] Sir Mortimer B. Davis-Jewish General Hospital, Lady Davis Institute for Medical Research, Montreal, Quebec

Background: Endothelin (ET)-1 has been implicated in the pathogenesis of atherosclerosis. Plasma and tissue ET-1 are increased in human and animal with atherosclerosis. ET-1 overexpression exacerbates high-fat diet (HFD)-induced atherosclerosis in apolipoprotein E knockout (apoE-/-) mouse. Abdominal aorta aneurysms (AAA) occur in association with atherosclerosis. We hypothesized that ET-1-induced ROS and inflammation would increase the occurrence of AAA in HFD fed apoE-/- mice.

Design and methods: Eight-week-old male transgenic mice overexpressing preproET-1 in the endothelium (eET-1), apoE-/-, eET-1/apoE-/- and wild type mice were fed a HFD for 8 weeks. Suprarenal aortic perimeter was determined using Oil Red O stained-sections. ROS production using dihydroethidium staining and monocyte/macrophage and T cell infiltration using immunofluorescence with MOMA-2 and anti-CD4 antibodies, respectively, were determined in perivascular fat and media in suprarenal aorta sections.

Results: Aneurysms were observed at a suprarenal level in 6 of 15 eET-1/apoE-/- mice compared to none of 15 apoE-/- mice ($P<0.05$). The aortic perimeter was 2.5-fold greater in eET-1/apoE-/- mice with AAA compared to apoE-/- mice ($P<0.01$). ROS production was increased 2.8- and 3.8-fold in perivascular fat and media of eET-1/apoE-/- mice compared to apoE-/- mice, respectively ($P<0.05$). Monocyte/macrophage infiltration was increased 2.6-fold in perivascular fat of eET-1/apoE-/- mice compared to apoE-/- mice ($P<0.01$). CD4+ T cell infiltration was observed in perivascular fat and plaque of 6 eET-1/apoE-/- mice compared to none of 6 apoE-/- mice, respectively ($P<0.05$).

Conclusions: These results suggest that ET-1 plays an important role in development of AAA by increasing oxidative stress and monocyte/macrophage and T cell infiltration in the aorta.

Oral Presentation 9:00 – 9:15 a.m.

Angiotensin 1-7 Attenuates Endothelin-1-Induced Endothelial Cell Inflammation and Growth Through Nitric Oxide Production and Activation of Mas and EndothelinB Receptors

Hiba Yusuf[1] and Rhian Touyz[1]

[1] Ottawa Hospital, Ottawa Hospital Research Institute, Ottawa, Ontario

Introduction: In pulmonary hypertension, where the endothelin system plays a major role, the vasoprotective axis of the rennin angiotensin system (ACE2-Ang (1-7)-Mas) seems to be protective. However, the exact mechanisms are still elusive and whether Ang 1-7 counterbalancing effects are beyond interactions with Ang II system is unknown.

Methods and Results: In this study, we assessed whether Ang 1-7 influences/interacts with the ET-1 system in endothelial cells. Cultured human microvascular endothelial cells (HMEC) were studied. HMEC were stimulated with ET-1 (10-7 mol/L) in the absence and presence of Ang 1-7 (10-7 mol/L), BQ788 (an ETBR antagonist), BQ 123 (an ETAR antagonist) and A779 (Mas receptor inhibitor) (10-6 mol/L). Expression of pro-inflammatory mediator (VCAM-1), cell growth marker (PCNA), Mas, ETBR expression and eNOS activation was determined by immunoblotting. ET-1 significantly increased expression of VCAM-1 (138.90% vs control, $p<0.05$) and PCNA (125% vs control, $p<0.05$). Ang 1-7 alone did not modulate pro-inflammatory and growth mediators, but significantly inhibited the effects of ET-1 on VCAM-1 (95.55%) and PCNA (103.83%) expression, an effect mediated by Mas receptor activation (after A779: VCAM-1: 226.15%; PCNA: 120% vs control, $p<0.05$). Ang 1-7 increased NO production (Ctl: 7.5 vs Ang 1-7: 20 RFU/ug of protein, by microfluorescence). Inhibition of Ang 1-7-induced NO production by L-NAME, inhibited Ang 1-7-mediated effects on ET-1-induced VCAM-1 (160%) and PCNA (125%), $p<0.05$. Ang 1-7 significantly increased expression of ETB receptors (175.63% vs control, $p<0.05$), an effect attenuated by A779. Ang 1-7 (166.94% vs control, $p<0.05$) and ET-1 (146.04% vs control, $p<0.05$) increased eNOS phosphorylation in HMEC. Blockade of Mas and ETB receptor inhibited Ang 1-7 and ET-1 effects on eNOS activation. BQ123, but not BQ788, blocked ET-1-stimulated inflammation/growth in HMEC (VCAM-1: 75%, PCNA: 100%, $p<0.05$).

Conclusion: In conclusion, Ang 1-7 negatively modulates proinflammatory and mitogenic actions of ET-1, through crosstalk between Mas and ETB receptors, and increase in NO production. These data highlight some molecular mechanisms whereby Ang 1-7 may exert beneficial effects in pulmonary hypertension and suggests a novel mechanism for Ang 1-7 signalling in HMEC.

Oral Presentation 9:15 – 9:30 a.m.

Enhanced Endothelin-1 Signaling Underlies Sex-Specific Hypertension in Aged Intrauterine Growth Restricted Offspring

Stephane L Bourque[1] and Sandra T. Davidge[1]

[1, 2, 3] Department of Obstetrics and Gynecology, University of Alberta, Edmonton, Alberta, Canada

Introduction: Intrauterine growth restriction caused by fetal hypoxia causes long-term alterations in vascular function, characterized by diminished nitric oxide (NO) signaling and enhanced responsiveness to vasoconstrictors in adult offspring. Here, we hypothesized that prenatal hypoxia would lead to increased synthesis of endothelin-1 (ET-1) from its inactive precursor big endothelin-1 (bET-1) in the vasculature of adult offspring, and this would underlie a hypertensive phenotype.

Methods: Dams were exposed to hypoxia (11% O2) from gestational day 15-21; controls were maintained at 21% O2 levels throughout pregnancy. At 14 months of age, offspring blood pressures (BP) were assessed by tail-cuff plethysmography and indwelling arterial catheters, and vascular responses to bET-1 were assessed by wire myography.

Results: Control male offspring had increased bET-1 conversion to active ET-1 (+179%) compared to IUGR offspring ($P<0.01$), and this effect was partially normalized by L-NAME. In contrast, no such differences were observed between control and IUGR female offspring. Male IUGR offspring had elevated BP compared to controls (+18mmHg, $P<0.01$), whereas no such differences were observed between female offspring groups. BP in male IUGR offspring were more responsive to ETA/B receptor antagonism compared to control male offspring (control:-3.58mmHg; IUGR:-9.32mmHg; $P<0.01$); BP responsiveness to ETA/B receptor antagonism in female offspring was similar between both groups (control:-2.8mmHg; IUGR:-3.5mmHg; $P=0.56$).

Conclusion: These results suggest that bET-1 conversion to active ET-1 is altered by prenatal hypoxia, and underlies a hypertensive phenotype. Furthermore, these results implicate ET-1 in the sexually dimorphic effects of prenatal hypoxia on cardiovascular function. Supported by the Canadian Institutes of Health Research and Alberta Innovates Health Solutions.

Oral Presentation 8:30 – 8:45 a.m.

Long-Term Physical Activity Adherence Following Cardiac Rehabilitation: A Multifactorial Analysis

Danielle. C. Bentley [1], Shazareen. N Khan [1, 2], Paul Oh [2], Sherry Grace [3], Scott G. Thomas [1, 2]

[1] Faculty of Kinesiology and Physical Education, University of Toronto, Toronto, Ontario.
[2] Toronto Rehabilitation Institute, Toronto, Ontario.
[3] School of Kinesiology and Health Studies, York University, Toronto, Ontario

Background: Cardiac rehabilitation (CR) is a multifactoral program designed to encourage long-term positive health behaviours, such as regular physical activity (PA), in patients following a recent cardiovascular event. Our knowledge of long-term PA participation and related factors is limited. Therefore, this research examined both PA participation and potential determinants among graduates 2-6 years after CR completion.

Methods: This retrospective cross-sectional study used the self-reporting tool Physical Activity Scale for the Elderly (PASE) to quantify PA behaviour. Information about potential PA correlates at the individual, community and service levels was acquired using a purpose specific questionnaire. Eligible participants (n=584) completed a 12 month CR program in Toronto. Results: Exploration of PASE scores, modified for analyses, revealed that seventy five percent of CR graduates met current Canadian physical activity guidelines. Univariate analyses identified 14 PASE score correlates, with each level of influence represented. Multivariate analyses (stepwise linear regression) identified the strongest model for the prediction of PA behaviour among CR graduates and included items that were already established (age, work status and PA enjoyment) and new items (CR staff support and home location) ($p<0.001$). PA enjoyment and CR staff support are modifiable correlates, arguably controllable by CR institutes. Additionally, more than half of participants indicated they would benefit from the ability to attend more rehabilitation sessions (53.8%) and/or the ability to have face-to-face meetings with CR staff when needed (55.5%). These factors could be the focus of future studies interested in CR participation and activity adherence.

Conclusions: Developing a more comprehensive understanding of the correlates of long-term PA behaviour among CR graduates will help identify groups at risk for non-adherence as well as assist with continued program development.

Oral Presentation 8:45 – 9:00 a.m.

Sodium Levels in Canadian Fast-Food and Sit-Down Restaurants

Mary J Scourboutakos [1] and Mary R L'Abbé [1]

[1] Department of Nutritional Sciences, University of Toronto, Toronto, Ontario

Background: High dietary sodium intake is the leading preventable risk factor for hypertension. Restaurant foods are a major contributor to dietary sodium intake. The evaluation of sodium levels in Canadian restaurant menus was undertaken.

Methods: Nutritional information was collected from the websites of the major sit-down (n=20) and fast-food (n=65) restaurants across Canada in 2010. Over four thousand meal items, baked goods, side dishes and children's items were analyzed in this study. Sodium levels (mg per serving) were compared to the recommended adequate intake (AI) and tolerable upper intake (UL) levels. Sodium densities (mg per 100 g) were compared to the US National Sodium Reduction Initiative (NSRI) targets.

Results: On average, individual sit-down restaurant menu items contained 1455 mg sodium/serving (or 97% of the AI level of 1500 mg/day). 40% of all sit-down restaurant items exceeded the AI for sodium and more than 22% of sit-down restaurant stir fry entrées, sandwiches/wraps, ribs and pasta entrées with meat/seafood exceeded the daily UL for sodium (2300 mg). Fast-food restaurant menu items contained, on average, 1011 mg sodium (68% of the daily AI), while side dishes (from sit-down and fast-food restaurants) contained 736 mg (49%). Children's menu items contained on average, 790 mg/serving (66% of the sodium AI for children of 1200 mg /day); a small number of children's items exceeded the children's daily UL. On average, 52% of establishments exceeded the 2012 NSRI density targets and 69% exceeded the 2014 density targets.

Conclusion: The sodium content in Canadian restaurant foods is alarmingly high. A large number of items exceeded the daily AI and UL and only a small number of establishments contained sodium levels that met the NSRI targets. To reduce the prevalence of hypertension, a population-wide sodium reduction strategy is needed to address the high levels of sodium in restaurant foods.

Oral Presentation 9:00 – 9:15 a.m.

Stress Management is Associated with Reductions in Systolic Blood Pressure and Waist Circumference in Cardiac Rehabilitation

Codie R. Rouleau [1], Andrea Stevenson [1], Ross Arena [2], Trina Hauer [3], Simon L. Bacon [4], Colleen Cannon [5], James A. Stone [3, 6, 7], Tavis S. Campbell [1]

[1] Department of Psychology, University of Calgary, Calgary, Alberta
[2] Physical Therapy Program, Department of Orthopedics and Division of Cardiology, and Department of Internal Medicine, University of New Mexico, Albuquerque, USA
[3] Cardiac Wellness Institute of Calgary, Calgary, Alberta
[4] Department of Exercise Science, Concordia University, Montreal, Quebec
[5] Heart Centre, St. Paul's Hospital, Vancouver, British Columbia
[6] Libin Cardiovascular Institute of Alberta, Calgary, Alberta
[7] University of Calgary, Calgary, Alberta

Introduction: Research on whether stress management can improve clinical outcomes among patients enrolled in cardiac rehabilitation has yielded equivocal findings.

Methods: The present investigation retrospectively examined the incremental impact of exercise and stress management (n = 188), relative to exercise only (n = 1,389), on blood pressure and other physical health outcomes and on psychosocial functioning following a 12-week cardiac rehabilitation program.

Results: Relative to exercise alone, participation in stress management and exercise was associated with greater reductions in systolic blood pressure ($t(1) = 2.07$, $P=.040$) and waist circumference ($t(1) = 2.12$, $P=.034$) in patients with baseline clinical elevations on these measures. The stress management group also had more depressive symptoms ($t(1) = 3.81$, $p < .001$) and lower physical quality of life ($t(1) = 3.00$, $p = .003$) than the exercise only group at baseline, but there were no differences between the groups at 12-weeks in terms of depressive symptoms ($t(1) = 1.74$, $p = .082$) or physical quality of life ($t(1) = 1.56$, $p = .120$).

Conclusions: These findings suggest that stress management may reduce systolic blood pressure and offer additional benefits, in selected patients, over and above exercise in cardiac rehabilitation. The incremental benefits of stress management on blood pressure and waist circumference are not surprising given that stress can affect both biological mechanisms and health behaviors that may contribute to elevated blood pressure and increased abdominal adiposity.

Oral Presentation 9:15 – 9:30 a.m.

The Risk of Falls on Initiation of Antihypertensive Drugs in the Elderly

Debra A. Butt [1, 2], Muhammad Mamdani [3], Peter C. Austin [4], Karen Tu [1, 4, 5], Tara Gomes [4], Richard H. Glazier [1, 4, 6, 7]

[1] Department of Family and Community Medicine, University of Toronto, Research Department, 500 University Avenue, 5th Floor, Toronto, Ontario
[2] Family and Community Medicine, The Scarborough Hospital, 3050 Lawrence Avenue East, Scarborough, Ontario
[3] Applied Health Research Centre, Li Ka Shing Knowledge Institute of St. Michael's Hospital, 193 Yonge Street, 4th floor, Toronto, Ontario
[4] Institute for Clinical Evaluative Sciences, 2075 Bayview Avenue, Toronto, Ontario
[5] Toronto Western Hospital Family Health Team, 399 Bathurst Street, 2nd Floor West Wing, Toronto, Ontario
[6] Department of Family and Community Medicine, St. Michael's Hospital, 30 Bond Street, Toronto, Ontario
[7] Centre for Research on Inner City Health, Keenan Research Centre, Li Ka Shing Knowledge Institute of St. Michael's Hospital, 30 Bond Street, Toronto, Ontario

Introduction: There is limited evidence to indicate that initiation of the common antihypertensive drugs is associated with an immediate increased risk of falls in the elderly.

Methods: This population-based, self-controlled case series study used healthcare administrative databases to identify new users of antihypertensive drugs in elderly aged 66 and older living in Ontario, Canada. A cohort of new users of antihypertensive drugs was linked to the occurrence of a fall from April 1, 2000 to March 31, 2009 to create exposed cases. The risk period was the first 45 days following antihypertensive therapy initiation, further subdivided into 0-14 days and 15-44 days with control periods before and after treatment in a 450-day observation period. The analysis determined the relative incidence (incidence rate ratio, IRR), defined as the rate of falls in the risk period compared to the rate of falls in the control periods.

Results: Of the 543,572 new users of antihypertensive drugs amongst community-dwelling elderly, 8893 experienced an injurious fall that required hospital care during the observation period. New users initiated on an antihypertensive drug had a 69% increased risk of having an injurious fall during the first 45 days following treatment, IRR 1.69 (95% confidence interval [CI] 1.57-1.81). This finding was consistent for thiazide diuretics, angiotensin II converting-enzyme (ACE) inhibitors, calcium channel blockers (CCBs) and beta-adrenergic blockers (BBs) but not angiotensin II receptor antagonists (ARBs). There was also an increased falls risk during the first 14 days of antihypertensive drug initiation, IRR 1.94 (95% CI 1.75-2.16) which was similar for thiazide diuretics, IRR 2.13 (95% CI 1.68-2.69); ACE inhibitors, IRR 1.88 (95% CI 1.60-2.22); ARBs, IRR 2.14 (95% CI 1.33-3.44); CCBs, IRR 1.53 (95% CI 1.13-2.06) and BBs, IRR 2.16 (95% CI 1.72-2.72).

Conclusion: This study suggests that initiation of antihypertensive drugs is a risk factor for falls in the elderly.

Oral Presentation 10:00 – 10:15 a.m.

Insulin Inhibits Renal Angiotensinogen Gene Expression and Prevents Hypertension in Diabetic Akita Mice via Heterogeneous Nuclear Ribonucleoprotein F and K Expression

Chan JSD [1], Abdo S [2], Lo CS [2], Isabelle Chenier I [2], Zhang SL [3]

[1, 2, 3] CHUM-Hotel Dieu Hospital Research Center, Montreal, Quebec

Introduction: Heterogeneous nuclear ribonucleoprotein F and K (hnRNP F/K) bind to the insulin-responsive element in the rat angiotensinogen (Agt) gene promoter and inhibits Agt gene transcription *in vitro*. We investigated whether insulin can stimulate hnRNP F/K expression in renal proximal tubular cells (RPTCs), inhibits Agt gene expression and prevents systemic hypertension (sHTN) in type 1 diabetic Akita mice.

Methods: Adult male Akita mice (12 weeks of age) were treated ± insulin implants for 4 weeks. Non-Akita mice served as controls. Plasma glucose, systolic blood pressure (SBP) and albuminuria were monitored weekly. Kidneys were processed for histology. Renal proximal tubular (RPT) Agt and hnRNP F/K mRNA and protein expression were evaluated by real time- qPCR and Western blotting, respectively. Urinary Agt and angiotensin II (Ang II) levels were quantified by ELISA. We also studied immortalized rat RPTCs (IRPTCs) ± stable transfection with a plasmid, pGL4 containing rat Agt gene promoter fused with a luciferase reporter *in vitro.*

Results: Akita mice developed sHTN (SBP: ~136 ± 3.8 mm Hg vs. ~108 ± 0.7 mm Hg in non-Akita mice) and exhibited renal hypertrophy. Insulin treatment normalized plasma glucose levels and sHTN, attenuated renal hypertrophy, decreased urinary albumin/creatinine ratio and urinary Agt and Ang II levels in Akita mice. Furthermore, RPT Agt expression was significantly increased whereas RPT hnRNP F/K expression was markedly decreased in Akita mice and these changes were normalized by insulin treatment. *In vitro*, high glucose (25 mM D-glucose) stimulated Agt gene promoter activity and inhibited hnRNP F/K expression in IRPTCs. Insulin reversed these effects, and its action was prevented by transfecting RPTCs with small interfering RNA of hnRNP F/K.

Conclusion: Our data suggest that insulin prevents sHTN and RPTC injury in diabetes through, at least in part, hnRNP F/K-mediated suppression of intrarenal Agt gene expression.

Oral Presentation 10:15 – 10:30 a.m.

Marked Neointimal Formation, Calcification and Vascular Remodeling in Coronary and Internal Pudendal Arteries From Aged Male Cadavers With Cardiovascular Disease

Johanna L. Hannan [1], Jacob M. Fox [2], Patrick M. Kennedy [2], Mackenzie J. Clarkson [2], H. Wayne Lambert [2], Trinity J. Bivalacqua [1]

[1] Department of Urology, Johns Hopkins Medical Institutes, Baltimore, MD
[2] Departments of Neurobiology and Anatomy, West Virginia University, Morgantown, WV

Introduction: With advancing age the incidence of cardiovascular disease and erectile dysfunction (ED) increases. ED is also a harbinger of cardiovascular disease. The pudendal artery is important for erectile function as it contributes to 70% of the total penile vascular resistance. The present study morphologically characterized coronary and pudendal arteries from male cadavers with and without cardiovascular disease.

Methods: Internal pudendal and coronary arteries were dissected from formalin fixed adult male cadavers (n=21, 49-86 years) who had died from natural causes or cardiovascular disease. Pudendals were sectioned distally (prior to dorsal artery), and proximally (prior to rectal artery), and coronaries from the middle of the artery. Arteries were paraffin embedded, sectioned and stained with Masson's trichrome or von Kossa. Lumen diameter, wall thickness, wall-to-lumen ratio and cross-sectional area were measured. Smooth muscle type and endothelial cells will be assessed by immunofluorescence with smooth muscle actin, smoothelin, cKit and PECAM-1 antibodies.

Results: All coronary and pudendal arteries had the presence of a neointimal layer and some evidence of calcification. Their smooth muscle layers were unorganized with a significant population of round synthetic-like cells. The coronary arteries had a larger lumen diameter than the pudendal arteries which tapered as they travelled distally towards the penis (9.5±0.9; 6.9±1.1; 5.2±0.8mm). The wall thickness was similar between all three arterial segments (1.8-2.4mm). The wall-to-lumen percentage drastically increased in the distal (53±19%) and proximal (40±8%) pudendal arteries compared to the coronary artery (22±5%). Additionally, one of the distal pudendal arteries was 90% occluded with a remarkable wall-to-lumen percentage of 186%. This is direct evidence that the penile bed undergoes more drastic remodeling prior to severe changes in the coronary arteries.

Conclusions: In aged males, coronary and pudendal arteries showed marked calcifications and vascular remodeling. Striking intimal thickening and plaques significantly decreased lumen diameter and occluded flow. This is the first study to characterize the morphological changes in both coronary and pudendal arteries in male cadavers and provide further evidence of a causative role of vascular structural changes in aging-induced ED.

Oral Presentation 10:30 – 10:45 a.m.

Antisense Oligodeoxynucleotide of Gi∝-2 and Gi∝-3 Proteins Attenuate the Development of Hypertension in Spontaneously Hypertensive Rats

Yousra El-Basyuni [1] and Madhu B. Anand-Srivastava [1]

[1] Department of Physiology, Faculty of Medicine, University of Montreal, Montreal, Quebec

Background: We have earlier shown that the levels of Gi∝-2 and Gi∝-3 proteins were augmented in Spontaneously hypertensive rats (SHR) before the onset of hypertension. In addition, intrapertoneal injection of pertussis toxin that inactivates both Gi∝ proteins prevented the development of hypertension in SHR. The present study investigates the specific contribution of Gi∝-2 and Gi∝-3 proteins in the development of hypertension using antisense oligodeoxynucleotide (AS).

Methodology: Gi∝-2 and Gi∝-3 antisense (1mg\Kg body weight) encapsulated in PEG/DOTAP/DOPE cationic liposomes were administrated intravenously into 3 weeks-old pre-hypertensive SHR and WKY, whereas the other groups of WKY and SHR received PBS ,empty liposomes or sense. The BP was monitored weekly using tail-cuff technique. Group of rats were scarified at the age of 6 or 9 weeks . Heart and aorta were used to study Gi proteins expression.

Results: The knockdown of Gi∝-2 protein by Gi∝-2-As injection prevented the development of hypertension up to 6 weeks of age (SBP: WKY, WKY-AS, SHR, SHR-AS,123.8±2,122.8±1.6,173 ± 3.9, 123±2.9 mmHg respectively) thereafter, it started increasing and reached the same level as that of untreated SHR (SBP:175.5±4.2mmHg), however, the BP in WKY rats was not affected by these treatments. On the other hand, the treatment of SHR with Gi∝-3-AS did not significantly attenuate the increase in BP (at 6 weeks, SBP: 160.8±3 vs 175.5±4.2mmHg). Furthermore, the levels of Gi∝-2 and Gi∝-3 proteins in heart and aorta from 6 week-old SHR and WKY rats treated with Gi∝-2-AS and Gi∝-3-AS were significantly decreased compared to control SHR and WKY rats respectively. However, at 9 weeks, Gi∝2-AS- and Gi∝3-AS- treated SHR that exhibited the same BP as that of untreated SHR also showed the same levels of Gi∝-2 and Gi∝-3 proteins.

Conclusions: These results suggest that the enhanced levels of both Gi∝-2 and Gi∝-3 proteins are implicated in the development of hypertension and that Gi∝-2 but not Gi∝-3 plays a major role in the development of hypertension in SHR. (supported by CIHR)

Oral Presentation 10:45 – 11:00 a.m.

Catharanthine Dilates Small Mesenteric Arteries and Decreases Cardiac Contractility by Inhibition of L-type Calcium Channel Currents

Ashok Jadhav [1, 2], Wenbin Liang [2], Peter C. Papageorgiou [2, 3], Ahmed Shoker [4], Sellian C. Kanthan [5], John Balsevich [6], Andrew S. Levy [2], Scott Heximer [2], Peter H.Backx [2, 3] and Venkat Gopalakrishnan [1]

[1] Department of Pharmacology, College of Medicine, University of Saskatchewan, SK
[2] Departments of Physiology and Medicine, Heart & Stroke/Richard Lewar Centre of Excellence, University of Toronto, Toronto, Ontario,
[3] University Health Network and Mount Sinai Hospital, Department of Medicine, University of Toronto, Toronto, ON, Canada,
[4] Department of Medicine, University of Saskatchewan, SK, Canada,
[5] Department of Surgery, University of Saskatchewan, SK, Canada,
[6] Plant Biotechnology Institute, National Research Council of Canada, Saskatoon, SK., Canada.

Introduction: Catharanthine is a constituent of anticancer vinca alkaloids. Its cardiovascular effects have not been investigated. This study compares the *in vivo* hemodynamic as well as *in vitro* effects of catharanthine on isolated blood vessels, vascular smooth muscle cells (VSMC) and cardiomyocytes.

Methods: Intravenous administration of catharanthine (0.5–20 mg/kg) to anaesthetized rats induced rapid, dose-dependent decreases in mean arterial pressure (MAP), heart rate (HR), left-ventricular blood pressure (LVBP) and cardiac contractility (dP/dt_{max}).

Results: Catharanthine evoked concentration-dependent decreases (I_{max} > 98%) in steady state tonic responses to phenylephrine (PE) and KCl in an endothelium-independent manner in aortic rings (mean IC_{50} for inhibition of PE: 28 µmol/L; KCl 34 µmol/L) and third order branches of small mesenteric arteries (MA IC_{50} for inhibition of PE: 3 µmol/L; KCl: 6 µmol/L). At similar concentration ranges, catharanthine also increased the vessel wall diameter (IC_{50} 10 µmol/L) and reduced intracellular free Ca^{2+} levels (IC_{50} 16 µmol/L) in PE-constricted MA. Patch-clamp studies demonstrated that catharanthine inhibited voltage-gated L-type Ca^{2+} channel (LCC) currents in cardiomyocyte (IC_{50} 220 µmol/L) and VSMC (IC_{50} 8 µmol/L) of MA.

Conclusion: Catharanthine lowers MAP, HR, LVBP and dP/dt_{max} in association with inhibition of LCC in both VSMC and cardiomyocytes. Since smaller blood vessels such as the third order branches of MA are more sensitive to the LCC blockade than conduit vessel, the primary site of action of catharanthine appears to be the resistance vasculature for lowering MAP while blockade of cardiac LCC may contribute to the reduction in HR and cardiac contractility.

Oral Presentation 10:00 – 10:15 a.m.

Canadian Attitudes Regarding Dietary Sodium and Government-Level Policy Interventions to Lower Canadian Sodium Intakes

Arcand J[1], Mendoza J[2], Qi Y[2], Lou W[2], L'Abbe M[3]

[1, 2, 3] University of Toronto, Toronto, Ontario

Background: Population-wide dietary sodium reduction is considered a priority intervention to address sodium-related chronic diseases, including hypertension. In 2010, the Canadian federal government published its sodium reduction strategy, targeting the food supply, public education and research. Understanding and monitoring Canadians' sodium intake knowledge, attitudes and behaviors, and their support for sodium-reduction interventions, are necessary for successful implementation of Canada's sodium reduction strategy. Objective: To evaluate Canadian attitudes towards sodium reduction and policy interventions aimed at lowering sodium intake by Canadians.

Methods: In December 2011 an online survey was administered to a panel of Canadian adults, 20-69 years. Participants responded to questions about sodium policy and knowledge, attitudes, and behaviors. Data was analysed to reflect 2006 Canadian census in relation to age, sex and region.

Results: Of the 2610 respondents, 66% were concerned about the amount of sodium in their diet. Overall 75% had previously or were currently limiting their sodium consumption (the 85% majority in order to maintain their health). For those 25% not limiting sodium intake, reasons were "low or normal blood pressure" (70%), "overall good health" (57%), or because their healthcare provider had not recommended it (34%). There was a high level of support for government policy interventions including: collaboration with the food industry to lower sodium in processed foods (85%); requiring mandatory disclosure of sodium levels in restaurant foods (74%); a high-sodium warning symbol on the packages of high sodium foods (76%); public education about the health effects (83%), sodium food sources (84%), and food label reading (79%). Financial incentives such as subsidizing low sodium foods (29%) and taxing high sodium foods (27%) were considered less favorable; only twenty-five percent felt the government should not intervene.

Conclusions: This data indicates that Canadians are concerned about dietary sodium and are largely in support of government-level interventions to lower sodium consumption in Canada.

Oral Presentation 10:15 – 10:30 a.m.

Microvascular Hypertensive Emergencies: Absolute BP vs Change in MAP Baseline to MAP at PRES

Herman RJ[1], Campbell NRC[2], Gabana CA[2], Khan N[2], Onrot J[3]

[1, 2, 3] University of Calgary, Foothills Hospital, Calgary, Alberta

Introduction: We collected all case series and cohort studies of PRES and eclamptic patients published in the English language literature between 2005 and 2010 looking at BP at the time of encephalopathy and at the change in BP from baseline, when available. We excluded patients with malignant hypertension and other studies where BP greater than 180/110-120 mmHg was required for inclusion.

Methods and Results: Patients were grouped according to the original authors' attributed cause. Within the purely hypertensive group, PRES occurred at BPs 10-20 mmHg lower in females than in males. Patients with PRES in the context of SIRS/sepsis or on chemotherapy/immunomodulatory drugs had near normal BP at the time of PRES. In most eclamptics, BP rose in the days leading to the event suggesting a hypertensive basis, but MAP at the time of PRES was 15 mmHg lower than that seen in female patients with hypertensive PRES. Change in MAP baseline to PRES in hypertensive PRES was 37 (95% CI, 31-43 mmHg), which is meaningfully and significantly higher than change in MAP of eclamptics at 14 (95% CI, 13-15 mmHg) and both are higher than change in MAP in low to normal BP-associated PRES. BP change in hypertensive PRES was normally distributed with 86% of all patients showing a change in MAP of at least 25 mmHg above baseline. Similarly, mean delta MAP in this group for increasing tertiles of baseline MAP from 75-92, 93-110 and 111-128 mmHg was 51 (95% CI, 39-64 mmHg), 34 (95% CI, 28-40 mmHg) and 31 (95% CI, 17-45 mmHg), respectively.

Conclusion: Mean delta MAP for increasing tertiles of baseline MAP in low-pressure causes of PRES hovered around zero change, showing no consistent relation to baseline MAP. In conclusion, females and patients with eclampsia have intact microvascular autoregulatory responses, but lower/narrower thresholds suggesting leakier capillaries, especially in eclampsia.

Oral Presentation 10:30 – 10:45 a.m.

Tolerability and Effectiveness of Nebivolol Compared to Other Add-On Therapies for Hypertension: A Retrospective Chart Review

Rajeev Ayyagari [1], David Cheng [1], Jipan Xie [1], Xing-Yue Huang [2], Eric Wu [1], Stephanie Chen [2]

[1] Analysis Group Inc., Boston, Massachusetts, United States
[2] Forest Research Institute, Jersey City, New Jersey, United States

Background: Current guidelines for hypertension treatment recommend add-on therapy if blood pressure (BP) remains poorly controlled by monotherapy. Nebivolol is a well-tolerated beta blocker whose efficacy as an add-on therapy has been documented in clinical trials.

Objective: Compare real-world tolerability and effectiveness of nebivolol versus hydrochlorothiazide, metoprolol, or amlodipine as first add-on hypertension therapy.

Methods: A medical chart study was conducted with patients who initiated nebivolol, hydrochlorothiazide, metoprolol or amlodipine as first add-on therapy (study drug) between 12/16/2010 and 7/21/2011. Data on study drug-related side effects (SEs) during the first year of add-on therapy were extracted along with BP measurements at drug initiation and at months 2, 4, and 6. Rates of SEs were compared across study drugs, adjusting for varying follow-up length using Poisson regression. Odds ratios (OR) comparing JNC7 BP goal achievement at month 2 across study drugs were estimated using a logistic regression. Regressions controlled for demographics, comorbidities, initial BP, hypertension history, first-line therapy, study drug dose, and physician specialty. Sensitivity analyses of BP goal achievement were conducted at months 4 and 6.

Results: Charts were reviewed for 1600 patients (400 for each study drug). Mean age was 56 years and 62% were male. Nebivolol patients had the lowest unadjusted rates of SEs and highest unadjusted rates of BP goal achievement. Incidence rate ratios of SEs for hydrochlorothiazide, metoprolol, and amlodipine versus nebivolol were 1.61 ($p=0.08$), 1.82 ($p=0.01$), and 2.67 ($p<0.01$), respectively. Hydrochlorothiazide, metoprolol and amlodipine were less likely to achieve BP control at month 2 compared to nebivolol (OR=0.61 [$p=0.02$], 0.39 [$p<0.01$], and 0.50 [$p<0.01$]). Sensitivity analyses yielded similar results.

Conclusions: In this chart study, patients receiving nebivolol as first add-on therapy had fewer SEs than those receiving metoprolol or amlodipine and were more likely to achieve BP control compared to patients receiving hydrochlorothiazide, metoprolol or amlodipine.

Oral Presentation 10:45 – 11:00 a.m.

Expression of a Hypofunctional Genetic Variant of GPER is Associated With Increased Blood Pressure

Yasin Hussain [1], Qingming Ding [2], Jozef Chorazyczewski [2], Robert Gros [2], Rob Hegele [3], Ross D. Feldman [2]

[1] Weill Cornell Medical College, Doha, Qatar
[2] Departments of Medicine , Physiology & Pharmacology, University of Western Ontario, London, Ontario
[3] Departments of Medicine & Biochemistry University of Western Ontario, London, Ontario

Introduction: GPER (aka GPR30) is a recently described G protein coupled receptor which mediates the rapid effects of steroids like estradiol and aldosterone. GPER activation has been shown to mediate acute hypotensive effects. Further, genetic deletion of GPR30 has been associated with a sex-specific increase in blood pressure. However, the impact of genetic regulation of GPER responses in humans is unknown.

Methods: To determine this we evaluated the in vitro and in vivo impact of expression of a commonly expressed human GPER genetic variant, GPER P16L. Wild type GPER and the P16L genetic variant were expressed in rat aortic vascular smooth muscle cells using adenoviral constructs. Expression of the P16L genetic variant was associated with significantly attenuated GPER-mediated effects on ERK phosphorylation, apoptosis and myosin light chain phosphorylation (vs. WT GPER). To determine the impact of expression of this hypofunctional GPER genetic variant on blood pressure phenotype in humans we studied 502 healthy adults of less than 40 years of age.

Results: The P16L GPER variant was expressed with an allelic frequency of 19%. Those expressing the genetic variant demonstrated significantly higher mean arterial pressure (83.1+0.6mmHg vs. 81.33+0.45, $p<0.05$), paralleling a significantly higher systolic BP (111.3 ± 0.7 mmHg vs.109.0 ± 0.6, $p<0.05$) and diastolic blood pressure(69.0 ± 0.6mmHg vs.67.5 ± 0.4 $p<0.05$). Notably, the increase in blood pressures was only evident in females as seen in mean arterial pressure (81.8 mmHg ± 0.7 vs. 79.3 ± 0.6 $p<0.05$), systolic blood pressure(108.4 ± 0.7 mmHg vs. 105.1±0.7 $p<0.05$) and diastolic blood pressure (68.5 ± 0.6 mmHg vs. 66.4±0.6, $P<0.05$) .Blood pressures were not different in males expressing the P16L genetic variant.

Conclusion: Overall, these data indicate that expression of a hypofunctional genetic variant of GPER is associated with increased blood pressure and support the hypothesis that GPER regulation may be an important determinant of hemodynamic function in humans.

Poster Presentation 11:30 a.m. – 1:30 p.m.

P22 - Acute Blood Pressure Response to Isometric Handgrip Resistive Exercise in Post-Menopausal Women: A Pilot Study

Danielle C. Bentley [1] and Scott G. Thomas [1]

[1] Faculty of Kinesiology and Physical Education, University of Toronto, Toronto, Ontario

Background: Lifestyle interventions with the aim of blood pressure (BP) reduction have been effective in reducing all-cause mortality and morbidity. These chronic BP reductions have been linked to an acute vascular response, post-exercise hypotension (PEH). PEH has traditionally been stimulated using aerobic exercise bouts, such as treadmill running or ergometer cycling. The use of isometric contractions to elicit PEH is an emerging area.

Methods: The present research investigates PEH in response to bilateral isometric handgrip contractions in post-menopausal women, a demographic of imperative concern. Women completed an acclimatization session followed by four experimental sessions. Two of those experimental sessions involved IHG as an exercise stimulus. Each IHG exercise session included; resting brachial BP (recorded at 2 minute intervals for a total of 10 minutes using an automated sphygmomanometer (BPTru)), isometric handgrip exercise protocol (seven bilateral contractions, 2 minutes in duration, at 60% of maximal volitional contraction strength, separated by 1 minute of rest), post-exercise brachial BP (same measurement technique for a total of 20 minutes).

Results: Participants were 5 post-menopausal women with an average age of 54.2 ± 3.4, an average BMI of 32.3 ± 6.4, average resting systolic blood pressure of 117.8 ± 5.4 and average resting diastolic blood pressure of 79.9 ± 4.6. In contrast to expectation, SBP and DBP increased following the exercise bout (2.9 ± 1.6; 3.4 ± 0.9).

Conclusions: Further exploration of this relationship is required, including studies which examine a variety of IHG exercise protocols to determine the best stimulus to elicit PEH in this specific population of post-menopausal women.

Poster Presentation 11:30 a.m. – 1:30 p.m.

P23 - Perceptions of Knowledge and Interprofessionalism Among Health Professional Students Participating in Cardiovascular Risk Reduction Initiative

Christopher Cheung [1], Erica Tsang [1], Todd Sakakibara [2]

[1] Faculty of Medicine, University of British Columbia, Vancouver, BC
[2] Department of Family Practice, University of British Columbia, Vancouver, BC

Introduction: The Workshop on Heart Health is an educational outreach program that provides an interdisciplinary approach to heart disease prevention for residents of Vancouver's Downtown Eastside community.

Methods: Health professional students were recruited from five health disciplines at the University of British Columbia. Each discipline was responsible for a facet of cardiovascular risk reduction including hypertension, diabetes, smoking cessation, and healthy diet and exercise. Outreach sessions are held in Vancouver's Downtown Eastside to educate residents about the importance of heart health. Knowledge of the five health topics amongst students was evaluated, along with perceptions on interprofessionalism, before and after the workshops.

Results: Before the workshop, medical students ranked their knowledge of exercise lower than others ($p < 0.05$), although this difference was not seen after the workshop. All students consistently ranked their knowledge of dental hygiene lower than other topics ($p < 0.05$). All students ranked their knowledge of hypertension and smoking cessation improved after participation in the workshop ($p < 0.05$). Using the Interdisciplinary Education Perception Scale, pharmacy students ranked their 'perceived need for cooperation' lower than other students before the workshop ($p < 0.05$), although this difference was not seen after the workshop. Medical students consistently ranked their 'perception of actual cooperation' lower than other students ($p < 0.05$). All students ranked their 'competency and autonomy' equally before and after the workshop. Statistical analysis included one-way, two-way, and repeated measure two-way ANOVA.

Conclusions: Students demonstrated an overall high level of background knowledge with some shortcomings in exercise and dental hygiene. Students improved their knowledge of cardiovascular risk reduction topics including hypertension and smoking cessation. The differences between perceptions of interprofessionalism may help guide medical education. Community service learning initiatives may serve as an important bridge between didactic lecture and clinical practice, and also encourage interprofessional development among students.

Poster Presentation 11:30 a.m. – 1:30 p.m.

P24 - Healthy Eating and Sodium Reduction - A National Campaign

Elaine De Grandpre[1]

[1] University of Ottawa, Health Canada, Ottawa, Ontario

Objectives: 1. By the end of the presentation, participants will have an understanding of the national healthy eating and sodium reduction campaign. 2. By the end of the presentation, participants will have a set of resources and tools to use in their practice.

Abstract: It is estimated that Canadians consume 3400 mg sodium per day on average, well above the Tolerable Upper Limit of 2300 mg/day and the Adequate Intake of 1500 mg/day set by the Institute of Medicine. There is a significant body of evidence linking high sodium intakes to elevated blood pressure, a risk factor for cardiovascular disease and kidney disease. This session is a follow-up to last year's "Myths and Realities about Sodium and How to Talk about It to Motivate Your Clients" presentation that focussed on the development of national sodium messages tested with Canadians and developed in collaboration with the Dietitians of Canada, EatRight Ontario, the Government of British Columbia and Health Canada. This year, we present about the integration of these messages in the social marketing approach, concepts and resources developed to increase Canadians awareness and understanding of healthy eating and sodium reduction. This innovative approach is based on collaborative partnerships with Provinces and Territories, health professionals, non-governmental organizations, media, retail and includes public relations and a web / digital engagement component.

Participants will become familiar with the campaign components and resources they can use when counselling their clients.
They will also understand how they can become partners in this initiative and co-brand material to use in their practice.

Poster Presentation 11:30 a.m. – 1:30 p.m.

P25 - Acute Kidney Failure After Renal Denervation

Diaconita V[1], **Floras JS**[2], **Rajan DK**[3], **Ing DJ**[3], **Oreopoulos G**[3], **Logan AG**[4]

[1, 3] University of Western Ontario, London, Ontario
[2, 4] Mount Sinai Hospital, Toronto, Ontario

Summary: Catheter-based renal sympathetic denervation significantly lowers the blood pressure (BP) of patients with drug resistant hypertension. No serious adverse consequences have been reported, and thus far there is no record of renal failure after this procedure.

Methods and Results: A 58 year old female with uncontrolled hypertension both in clinic and on ambulatory 24-hour BP monitoring despite receiving seven anti-hypertensive medications including furosemide and spironolactone was referred for this procedure. Her past medical history included an episode of malignant hypertension, early stage three chronic renal disease, and Parkinson's disease. Seven years ago she had been hospitalized for the management of acute pre-renal failure. Following denervation her systolic BP fell to 105-110 mmHg, doses of atenolol and clonidine were tapered, and all other anti-hypertensive medications including diuretics were stopped. Twenty days after the procedure she returned to hospital feeling unwell. Systolic BP was 82 mmHg. She was bradycardic. Serum potassium was 8.9 mmol/L and serum creatinine, 639 umol/L. Urinalysis was unremarkable. Random UNa was 85 mmol/L and UK, 10 mmol/L, a pattern consistent with renal tubular dysfunction. Plasma renin mass was 623 ng/L (normal range 6-20), plasma aldosterone, 417 pmol/L and serum cortisol, 424 nmol/L. Urine output and creatinine improved rapidly after resuscitation from hypovolemic shock with normal saline. At 3 month follow-up assessment, serum creatinine 101 umol/L and office BP was 132/96 on furosemide and spironolactone only. Repeat renal imaging was unremarkable.

Conclusions: The clinical course of this patient suggests that catheter-based renal sympathetic denervation can impair renal sodium handling, which could lead to severe hypovolemia and acute renal failure. Patients with Parkinson's disease or other conditions associated with autonomic dysfunction may be particularly vulnerable. As a result of this experience we now assess the renal function and volume status of all our renal denervation patients 72 to 96 hours after this procedure.

Poster Presentation 11:30 a.m. – 1:30 p.m.

P26 - Eligibility for Catheter-Based Renal Sympathetic Denervation Amongst Hypertensive Patients Specifically Referred for the Procedure

Diaconita V[1], Floras JS[2], Rajan DK[3], Ing D[3], Oreopoulos G[3], Miller J[3], Rubin B[3], Logan AG[4]

[1] University of Western Ontario, London, Ontario
[2,4] Mount Sinai Hospital, Toronto, Ontario

Introduction: Catheter-based renal sympathetic denervation (RSDN) significantly lowers the blood pressure (BP) of patients with drug resistant hypertension. To be eligible for RSDN in Canada, patients must have uncontrolled office hypertension defined as a systolic BP ≥160 mm Hg or 150 mm Hg for diabetics (no diastolic BP criteria) on optimal doses of a diuretic and at least two additional antihypertensive medications. Health Canada also specified age ≥18 years old, no type 1 diabetes mellitus, eGFR ≥45 mL/min/1.73m2, no secondary cause of hypertension, normal renal vasculature, no renal stents and not pregnant.

Methods and Results: As of July 31, 2012, we have been referred 37 patients (26 men and 11 women with an average age of 59.19 years) specifically to determine eligibility for the procedure. Of these, 31 (84%) had drug-resistant hypertension, yet only 22 met the eligibility criteria (5 failed BP eligibility criteria; 2 had primary aldosteronism; 1 had low eGFR; and 1 had low eGFR in addition to previous RA stenting). Of the potentially eligible subjects, 4 have had the procedure, 3 have declined and an additional 6 are being scheduled. The remaining subjects are in the process of being evaluated for eligibility.

Conclusion: Although the reported prevalence of drug-resistant hypertension amongst treated hypertensive patients is as high as 14% in recent surveys, our findings suggest that a sizable fraction of these individuals are not eligible for RSDN because of a high prevalence of renal artery stenting and anatomical abnormalities, patient factors or newly diagnosed secondary hypertension that preclude its deployment according to current Health Canada criteria.

Poster Presentation 11:30 a.m. – 1:30 p.m.

P27 - Evaluation of the Effect of Cardiovascular Risk Assessment on Treatment Compliance in Hypertension

Gryn S[1], Har B[1], Dresser G[1]

[1] University of Western Ontario, London Health Sciences Center, London, Ontario

Summary: Compliance with drug therapy is the cornerstone of effective treatment for hypertension. Factors that determine compliance are poorly understood, and interventions to improve compliance are lacking. In this study, we aim to determine whether effective communication of the risks associated with hypertension to patients will alter compliance behavior.

Methods and Results: We conducted a randomized controlled trial evaluating the clinical use of individualized cardiovascular risk assessment and its communication to hypertension patients on medication compliance. The control patients received usual care, while patients randomized to the intervention also received enhanced knowledge of their personal estimated risk of heart disease and stroke, as well as education on the utility of effective blood pressure management at decreasing their risk. Compliance was assessed using a combination of pill counting and electronic pill bottles. Patients were evaluated at baseline, 3, 6, and 12 months (4 visits). The primary outcome was compliance with therapy (i.e. percentage of pills taken as prescribed), and preliminary data analysis revealed a trend towards improved compliance in the intervention group as compared with the control group (89% vs 79%, P=0.21). Secondary outcomes include effect on blood pressure, patient perception of their cardiovascular and stroke risk, and perceived benefit of treatment. Patients who received the intervention had a trend towards having lower blood pressure by the final visit (140 vs. 148, P=0.11). They perceived their cardiovascular and stroke risk as lower than those in the control group (4.2 vs 5.5 on a 10 point scale for CHD, P=0.0094, and 4.2 vs 5.8 for stroke risk, P=0.0026). There was no difference in the patients' perceived risk reduction with therapy (7.1 vs 7.2, P=0.87).

Conclusion: This study suggests that educating patients on their cardiovascular risk may actually decrease their perception of their risk, although there seems to be a trend towards improved compliance and blood pressure.

Poster Presentation 11:30 a.m. – 1:30 p.m.

P28 - Patients Exposed to Nifedipine Via Differing Osmotic Delivery Systems have Differing Patterns of Nocturnal Dipping

Herman RJ[1], Pollak PT[1], Zarnke KB[1]

[1] University of Calgary, Foothills Hospital, Calgary, Alberta

Introduction: Several patients were observed to have unexplained increases in BP >10 mmHg following silent switching of daily nifedipine administration from a 2-compartment (Adalat XL=AdN) to a 1-compartment (Mylan=MyN) osmotic delivery system.

Methods and Results: In exploring potential causes, we documented differences in nocturnal dipping between AdN and MyN using 24-h ABPM recordings in 3 healthy, normotensives. We then studied 12 patients with ABPM recordings made after 7 days dosing of each drug. A similar blunting and delay of nocturnal dipping was observed for 4 patients given the MyN formulation. Because clinical dosing of nifedipine produces concentrations on the steep portion of the dose-response curve for BP lowering, and with a half-life of only 2 h, differences in drug delivery rate during a partial dosing interval (2-4 h) could lead to changes BP response, even though differences in time-averaged mean concentration time profiles over 24-h have not been detected. AdN and MyN are deemed bioequivalent by many health regulatory jurisdictions (i.e., 24-h AUC/Cmax differences less than or equal to +/- 20%) despite differing release technologies and dissimilar time-release profiles. The result of this and a policy of mandatory substitution of generic equivalent products means patients are switched from 1 formulation to the other without notice and without the consent of the prescribing physician. Clinically, some patients appear sensitive to differences in nifedipine delivery formulation, representing a recognized increase in their hypertensive risk.

Conclusions: This preliminary data suggest that nocturnal dipping on 24-h ABPM is a useful parameter to scrutinize when looking for different responses to nifedipine formulations. The question is, if 30% of patients are sensitive this difference in delivery technology, should any patient be switched from AdN to MyN without documenting 24-h ABPM on both medications? Further study of the magnitude of this problem is required.
Keywords: Nifedipine, delivery systems, generic switching, ambulatory blood pressure monitoring.

Poster Presentation 11:30 a.m. – 1:30 p.m.

P29 - The Validity of Blood Pressure (BP) Kiosk Validation Studies: A Systematic Review

Sherilyn Houle[1], Yazid N. Al Hamarneh[1], Ross Tsuyuki[1]

[1] EPICORE Centre, Department of Medicine, University of Alberta, Edmonton, Alberta

Introduction: Public-use BP kiosks in pharmacies play an important public health role since they are used about 1000 times/month. Although the accuracy of these devices has been challenged, the quality of the studies evaluating this has not been assessed systematically. We conducted a systematic review of studies evaluating accuracy of BP kiosks to assess their adherence to validation standards.

Methods: We searched MEDLINE and EMBASE for English language articles using the terms sphygmomanometer, blood pressure monitor, blood pressure device, validation, reproducibility, accuracy, reliability, and precision. Two investigators independently screened citations and performed data extraction. We included articles that were original studies evaluating the accuracy/validation of BP kiosks. We excluded publications prior to 1987 (when the first validation standards were published), or studies performed only in special populations (children, pregnant women, or patients with diabetes or kidney disease). We evaluated study methods for their adherence to cited standards: British Hypertension Society (BHS), Association for the Advancement of Medical Instrumentation (AAMI) or European Society of Hypertension (ESH), or in those not citing a standard, we used those existing at the time of study conduct.

Results: 4255 titles were reviewed and 9 were included. Devices tested included CardioTech®, Computerized Screening Inc®, PharmaSmart®, and Vita-Stat®. Only 1 study (of the PharmaSmart® kiosk) came close to meeting all cited validation standards. Common deficiencies included failure to meet criteria for variation in patients' BP and/or arm circumference (n=9), utilizing a single observer rather than two trained observers (n=8), not taking 3 sets of measurements (manual, device, manual) per patient (n=7), and inadequate number of patients (n=5).

Conclusions: We found that most BP kiosk studies did not meet AAMI, BHS, or ESH standards. This may lead to misinterpretation of device validity in either direction. Adherence to standards is encouraged when conducting accuracy/validation studies of BP monitors.

Poster Presentation 11:30 a.m. – 1:30 p.m.

P30 - Increased Von Willebrand Factor Predicts Sexual Dysfunction in Men but not in Women

Maio T[1], Pruss C[2], Barr S[2], Holden RM[2], Ross R[2], Adams MA[3]

[1,2,3] Queen's University, Department of Biomedical and Molecular Sciences, Kingston, Ontario

Introduction: Endothelial dysfunction is prevalent among men and women with cardiovascular disease (CVD). However, its role in sexual dysfunction (SD), particularly in women, has not been well elucidated. We sought to determine whether Von Willebrand Factor, a marker of endothelial function, was elevated in men and women with SD.

Methods: The sexual function and circulatory health of overweight and obese men (N=23, 34-67; 52.1±9.8 years) and women (N=41, 34-64; 49.9±8.2 years) was assessed. Male sexual function was determined via IIEF questionnaires (scores ≤25 reflect SD). Females received FSFI questionnaires (scores ≤26 reflect SD). BMI, waist circumference and plasma osteoprotegerin (OPG), C reactive protein (CRP), VWF antigen (VWF:Ag) and VWF propeptide (VWFpp) were measured.

Results: BMI and waist circumference were similar between SD and normal individuals in both sexes (males: BMI: 33.6±4.6 kg/m2, waist: 117.9±9.2 cm. females: BMI: 33.1±4.5 kg/m2, waist: 105.5±10.4 cm). In males with SD there was a significant increase in both VWF: Ag (123.1±23.0 vs. 95.3±22.6 no SD) and VWFpp (127.1±11.3 vs. 114.1±14.3 no SD). Conversely, women without SD had significantly increased VWFpp (137.8±21.8 vs. 118.0±26.1 with SD), but there was no difference in VWF:Ag (129.0±42.4 vs. 105.3±41.7 with SD).
There were no differences in other biomarkers (OPG, CRP). All values expressed as mean ±SD (P<0.05).

Conclusions: In overweight and obese men with SD, there was an increase in circulating VWF:Ag and VWF:pp but not in other biomarkers such as OPG and CRP. On the contrary, women without SD had increased VWFpp levels. The difference between men and women with regard to endothelial function in SD suggests that other mechanisms are likely involved in this condition in women. That is, vascular mechanisms, specifically endothelial function, appear to play a greater role in this male population. (Funds:H&SC, CIHR, MTM:CIHR-DRA CP:Queen's Dept.Med-PDF)

Poster Presentation 11:30 a.m. – 1:30 p.m.

P31 - Changes in Hypertension Treatment Efficiency by General Practitioners and Cardiologists of the Yaroslavl Region of Russia

Mozheyko Maria E[1], Eregin SY[1], Hughes DL[1], Vigdorchik AV[1]

[1] Yaroslavl Regional Hospital of War Veterans, Department of Health of Yaroslavl Region

Introduction: The aim of two surveys conducted in 2011 and 2012 was to evaluate real life clinical practice of hypertension patients' management by general practitioners (GPs) and cardiologists of Yaroslavl Region (YR) at baseline and after the introduction of a new protocol of treatment based on 2010 Russian National Hypertension Guidelines and intensive educational campaign based on Canadian Hypertension Education Program.
Both cross-sectional surveys were conducted over a period of 2 months in 39/38 ambulatory institutions of YR healthcare in 2011/2012 accordingly. 154/26 GPs/cardiologists participated in 2011 and 176/25 in 2012. They were asked to submit survey diaries on 10/15 consecutive hypertension patients each in 2011/2012.

Results: 1525/269 GPs'/cardiologists' patients' diaries were analyzed in 2011 and 2619/373 diaries in 2012 accordingly. GPs'/cardiologists' patients were mostly women (62%/52% in 2011, 62%/58% in 2012), mean age 61/58 years in 2011, 59/58 years in 2012, and of working age 45%/59% in 2011 and 46%/45% in 2012. Mean BP level in GPs' patients was reduced from 150/89 to 147/87 mmHg, and in cardiologists' patients from 151/91 to 149/89 mmHg. Blood pressure (BP) control < 140/90 mmHg significantly increased in all patients from 16.8% in 2011 (n=1794) to 23.0% in 2012 (n=2992), 37% relative increase, p<0.0001. Systolic BP (SBP) control (< 140 mmHg) increased from 19.3% to 26.5% in GPs and from 24.9% to 25.7% in cardiologists. 44.6%/41.7% of GPs'/cardiologists' patients had SBP 140-159 mmHg in 2011 and 41.9%/43.7% in 2012, 26.7%/21.9% – had SBP 160-179 mmHg in 2011 and 25.2%/23.9% in 2012, and 9.4%/11.5% - had SBP >180 mmHg in 2011 and 6.4%/6.7% in 2012 accordingly.

Conclusions: The fraction of patients with target blood pressure level was similar to Russian national levels in 2010, and was increased mostly in GPs' patients after implementation of the treatment protocol and education campaign specifically targeted at general practitioners.

Poster Presentation 11:30 a.m. – 1:30 p.m.

P32 - Orthostatic Stress Does Not Activate the Renin-Angiotensin-System in Physically Active Premenopausal Estrogen-Defficient Women

Emma O'Donnell[1], Jack M Goodman[1], Hisa Murai[2], Beverley L Morris[2], John S Floras[2] and Paula J Harvey[3]

[1] Cardiovascular Research Laboratory, Department of Exercise Sciences, University of Toronto, Toronto, Ontario
[2] Division of Cardiology, Dept of Medicine, University of Toronto, Toronto, Ontario
[3] Division of Cardiology, Women's College Hospital, Department of Medicine, University of Toronto, Toronto, Ontario

Background: Estrogen deficiency in menopause is associated with renin-angiotensin-aldosterone system (RAAS) activation and a rise in arterial blood pressure (BP). The influence of estrogen deficiency on RAAS and BP in physically active premenopausal women with functional hypothalamic amenorrhea (ExFHA) is not yet known.

Hypothesis: RAAS responses to orthostatic stress would differ in women with ExFHA compared with estrogen replete women.

Methods: Three groups were studied: recreationally active (ExOv; n=10; 23±1 years; body mass index 21.3±0.6 kg/m^2; mean±SEM) and sedentary (SedOv; n=13; 23±2 years; 20.9±0.5 kg/m^2) ovulatory eumenorrheic women, and women with ExFHA (n=9; aged 26±1 years; 20.9±0.9 kg/m^2). BP (mmHg), heart rate (HR; beats/min), and plasma renin, angiotensin II (AngII), and aldosterone were measured during supine rest and during 8-minute stages of graded lower body negative pressure (LBNP; -10, -20, and -40mmHg; 5 minutes recovery between stages).

Results: Baseline HR and systolic BP (SBP) were lower ($p<0.05$) in ExFHA (47±3 and 93±2, respectively) compared with both ExOv (57±3 and 107±3) and SedOv (60±2 and 102±2) women. Baseline RAAS components, diastolic BP (DBP), and mean arterial BP (MAP) were similar ($p>0.05$) between the groups. LBNP increased ($p<0.05$) HR and decreased ($p<0.05$) SBP in all groups, but responses were lowest ($p<0.05$) in ExFHA. DBP and MAP decreased ($p<0.05$) similarly in all groups ($p>0.05$). LBNP increased ($p<0.05$) renin and AngII in ExOv and SedOv women, but did not ($p>0.05$) in ExFHA women. Aldosterone increased in ExOv and SedOv, but decreased in ExFHA women ($p<0.05$ main effect of LBNP).

Conclusion: In contrast to estrogen replete women, ExFHA women demonstrate consistently low SBP and do not demonstrate the anticipated reflex activation of RAAS during orthostatic stress. This response is in contrast to that reported in postmenopausal women. Etiology of estrogen deficiency is likely an important consideration in understanding the effects of estrogen on BP regulation.

Poster Presentation 11:30 a.m. – 1:30 p.m.

P33 - Gout in Hypertension

Samia L.L.Rizk[1] and Badawi Labib Mahmoud[1]

[1] Department of Medicine, Ain Shams University, Cairo, Egypt

Introduction: Hypertension is associated with increased incidence of gout. The causes of gout in hypertension are linked to decreased urate excretion due to renal changes. The study showed that the presence of hypertension is independently associated with the risk of gout due to decreased renal blood flow with increased renal and systemic vascular resistance, and decreased renal excretion of urate. Also certain antihypertensive drugs increase the level of serum uric acid, e.g. Beta blockers have been shown to increase the serum level of uric acid while Calcium channel blockers and losartan (angiotensin 11 blocker) would lower or have no effect on serum uric acid.

Methodology: This study included 200 people, aged between 20 and 89 and were divided into three groups: Group I: included 50 patients who suffered from hypertension and gout and were put on either Calcium channel blockers or losartan. **Group II:** included 50 hypertensive patients and suffered from gout and were put on other types of antihypertensive medication as Beta blockers, diuretics, angiotensin converting enzyme inhibitors or non losartan angiotensin 11 blocker. **Group III:** included 100 people acted as a control group. The groups were tested for different parameters as age, sex, alcohol intake, smoking, medication intake, onset of gout, treatment for gout, compliance with antihypertensive medication, any other associated disease as ischaemic heart disease, hyperlipidaemia, hypertension or real failure, regular visits to the general practitioner and results of laboratory tests.

Results: The study showed that the incidence of gout was lower with patients who were put on calcium channel blockers or losartan compared to other patients who were put on other antihypertensive medications.

Conclusion: The study showed that the incidence of gout was lower with patients who were put on calcium channel blockers or losartan compared to other patients who were put on other antihypertensive medications. This could be explained as calcium channel blockers increase glomerular filtration rate and clearance rate of uric acid and creatinine. Losartan act as a uricosuric agent.

Diuretics increase renal reabsorption of uric acid from the proximal convoluted tubule, and propranolol decreases renal clearance.
Also angiotensin converting enzyme inhibitors have not been associated with lower serum uric acid levels. This study showed the appropriate choice for antihypertensive medication to decrease incidence of gout in hypertension.

NOTES

NOTES

VASCULAR 2013
VASCULAIRE 2013

COMING TOGETHER. FOR VASCULAR HEALTH.

Recognizing the need for knowledge exchange in vascular health, the Canadian Cardiovascular Congress joins forces with Canadian Stroke Congress, the Canadian Diabetes Association / Canadian Society of Endocrinology and Metabolism Conference, and the Hypertension Canada Congress for ***Vascular 2013***. This one-time Canadian event will bring Canada's key medical conferences under one roof and mark an unprecedented educational and community building opportunity. Physicians, scientists, clinicians, nurses, educators, allied health professionals, and policy makers will be there. Will you?

ENSEMBLE... POUR LA SANTÉ VASCULAIRE.

Afin de refléter la nécessité de l'échange de connaissances dans le domaine de la santé vasculaire, le Congrès canadien sur la santé cardiovasculaire, a décidé de s'associer au Congrès canadien de l'accident cérébrovasculaire, la conférence de l'Association canadienne du diabète/Société canadienne d'encrinologie et de métabolisme et le Congrès de Hypertension Canada pour l'organisation de ***Vasculaire 2013***. Cet événement unique au pays va réunir en un même lieu des congrès médicaux clés et représente une occasion sans précédent de formation et de renforcement du sentiment de solidarité et de communauté entre spécialités. Des médecins, des scientifiques, des cliniciens, des infirmières, des professeurs, des professionnels paramédicaux et des responsables politiques seront au rendez-vous. Le serez-vous aussi?

OCTOBER 17-20, 2013 • MONTRÉAL, QC • vascular2013.ca

Canadian Diabetes Association | CSEM SCEM | Canadian Cardiovascular Congress / Congrès canadien sur la santé cardiovasculaire | Canadian Stroke Congress / Congrès canadien de l'AVC | Heart & Stroke Foundation | Hypertension Canada

Hypertension
CANADA

Sign up to become a Hypertension Canada member for the latest on the CHEP annual recommendations and continuing professional development programs, as well as direct access to the latest educational tools and resources. Visit our website for more details!

www.hypertension.ca

@HTNCanada

HypertensionCanada