Health Research Society of Canterbury

AGM and Scientific Meeting

Wednesday 14 June 2006
5 pm – 7:15 pm in the Rolleston Lecture Theatre
(Ground Floor, School of Medicine)

5:00 ANNUAL GENERAL MEETING

5:15 ORAL PRESENTATIONS

5:15 **Demographic and physiologic profiles of patients undergoing videofluoroscopic swallowing studies**
Michael Dimov, Maggie-Lee Huckabee, Irene Hudson

5:30 **Flow mediated dilation of the brachial artery: methods development and effects of exposure to diesel exhaust on endothelial function**
Fiona Sands, Alon Peretz, Joel Kaufman, Daniel Leotta, Edward Gill, Jeffery Sullivan, Marla Paun, Carol Trenga, Sara Jarvis, Heidi Curtiss, Mary Aulet

5:45 REFRESHMENTS

Drinks & nibbles in the Rolleston Foyer. There will be no charge for refreshments as this is covered by the $10 subscription which will be gladly accepted at the meeting!!

6:15 ORAL PRESENTATIONS CONT.

6:15 **Sex steroids and vasoactive factors in endothelial cells**
Lachlan Pearson, Timothy Yandle, Gary Nichols, John Evans

6:30 **Postural hypotension in the mechanism of transient ischaemic attacks**
Elna Ellis, David Jardine, John Fink

6:45 **Formation of foam cell from human monocyte-derived macrophages in the absence of modified low density lipoprotein**
Zunika Amit, Steven Gieseg

7:00 **Something smells fishy: Preserving the nutritional value of aquacultured fish**
Nicholas Tuckey, Steven Gieseg, Malcolm Forster

Health Research Society of Canterbury

36th Annual General Meeting, 14 June 2006

Agenda

1. Apologies
   John Evans, Virginia Irvine, Richard Tremewan, Elisabeth Wells
2. Minutes of the 35th AGM held on 11 May 2005 *(attached)*
3. Chairperson's report – Zoltán Endre
4. Financial statement – Michael MacAskill
5. Election of Executive

   The following members of the Committee offer themselves for re-election:

   Tim David (UoC), Zoltán Endre (CSM&HS), John Fink (CDHB), Michael MacAskill (CSM&HS), Magnus McGee (CSM&HS), Darin O'Keeffe (CDHB), Chris Pemberton (CSM&HS), Anna Pilbrow (CSM&HS), Geoff Shaw (CDHB).

   Dr Maggie-Lee Huckabee has been nominated as a new ordinary committee member (Jones/ MacAskill).

   Dr Rebecca Roberts has been nominated as Secretary (Cameron/Pilbrow).

   Dr Anna Pilbrow has been nominated as Treasurer (Endre/MacAskill).

   Prof Zoltán Endre has been nominated for re-election as Chairman (Shaw/MacAskill).

   Other nominations for these positions and for additional committee members will be taken from the floor.
6. General business

Minutes of the 35th Annual General Meeting, 11 May 2005, held in the Rolleston Lecture Theatre, Christchurch School of Medicine

Opening. The meeting was opened at 5:03 p.m.

Present. Dr Geoff Shaw (in the chair) and 35 members.

Apologies. Elisabeth Wells, Ross Bowie, Simon Causer, Richard Gearry, Martin Kennedy, John Dalrymple-Alford, Tim David, Don Beaven

Minutes. The minutes of the previous AGM were accepted.

Chairperson's report. Dr Geoff Shaw presented the chairperson's report.

Financial statement. The financial statement to 31 March 2005 was presented by the Secretary/Treasurer (Dr Michael MacAskill).

Constitutional amendment.
The proposed new constitution was debated. There was discussion on indefinite term limits for ordinary members and on the name of the society. An amendment was moved by Richard Jones that the term 'Chairman' be retained rather than the proposed 'President.

The adoption of the new constitution, with the above amendment, was moved by Geoff Shaw (seconded by Chris Charles), and passed unanimously.

Election of officers.
Dru Mason (Zoology, Canterbury University) & Elisabeth Wells (Public Health, CSM&HS) retired from the Committee, each after many years of service to the Society.

The following members of the Committee offered themselves for re-election and were duly re-elected:

Geoff Shaw (Outgoing Chairman) – Intensive Care
Michael MacAskill (Outgoing Secretary/Treasurer) – Medicine
John Fink – Neurology
Chris Pemberton – Endolab
Darin O'Keeffe – Medical Physics

Prof Zoltán Endre, Dr Magnus McGee and Anna Pilbrow were elected as new members, Prof Endre as Chairman.

No nominations for the role of Secretary were received. Michael MacAskill agreed to continue as Acting Secretary.

Closure
There being no further business, the AGM closed at 5:20 pm.

Health Research Society of Canterbury

Annual Financial Statement to 31 March 2006

Balance brought forward (as at 31.03.05) $3 618.18

Income	**2004/2005**	**2005/2006**
Subscriptions	495.00	330.00[1]
3M	300.00	0.00
M & P Paykel Trust	2100.00	0.00
CMRF	200.00	250.00[2]
Interest	8.99	0.00
Total	3103.99	580.00
Expenditure		
Catering	320.00	360.00
Drinks	92.60	179.80
Prizes	0.00	300.00
CHSRC student subsidy	2100.00	0.00
Total	2512.60	839.80
Income over expenditure	**591.39**	**(259.80)** [3]

Current balance as at 31.03.06 **$ 3 358.38**

Notes:

[1] An additional $131 of subscriptions were received in the 2005 year but not banked until the 2006 year: will appear in next year's accounts.

[2] Cheque from CMRF for AGM catering.

[3] This deficit is due to the the 2004 prize appearing in the 2005 financial year, where it was funded by a 3M grant. This year's prizes were paid separately via the CMRF at the Canterbury Heath Research Conference.

Recommendations:

1 – That the report be received

2 – That the annual subscription remain at $10 for 2006/2007

Michael R. MacAskill
Secretary/Treasurer

Demographic and Physiologic Profiles of Patients undergoing Videofluoroscopic Swallowing Studies (VFSS)

Michael Dimov[1, 2, 3], Maggie-Lee Huckabee[1, 2], Irene Hudson[1, 4]

[1] Van der Veer Institute for Parkinson's and Brain Research

[2] Department of Communication Disorders, University of Canterbury

[3] Watford and Three Rivers Primary Care Trust, Watford, United Kingdom

[4] School of Mathematics and Statistics, University of South Australia

The videofluoroscopic swallowing study (VFSS) is recognized as the primary diagnostic technique for swallowing impairment. This retrospective study was designed to characterize demographics, physiologic swallowing profiles, and healthcare outcomes in 498 patients who had undergone VFSS from 1993-2003 at two regional healthcare centres in New Zealand. To describe the patient population, data were collected from the medical record regarding gender, etiology, age and health care setting at time of swallowing evaluation. Records were further scrutinized for healthcare outcomes, including survival, dietary presecriptions, use of alternative feeding and morbidities such as respiratory infection. VFSS were evaluated using Subscale 1 of the New Zealand Index for Multidisciplinary Evaluation of Swallowing (NZIMES) to gather information regarding physiologic profiles. Inter- and intra-rater reliability was high (ICC = 0.81 and 0.94 respectively, based on 20% of cases). NZIMES ratings revealed that 16.3% of patients received a rating of 'normal' on all physiologic features of swallowing; 48.8% of patients demonstrated no physiologic rating score above 'mild' in any category. However, despite the overrepresentation of non- or mildly impaired individuals, a normal diet level was recommended for less than 10% of patients. The average survival length post VFSS was 644.4 days; however 21.5% of acute patients survived less than 30 days and 51.8% survived less than 6 months post their examination. Other outcomes data will be reported and discussed. Given existing data on the prevalence of dysphagia, this study suggests a need to carefully evaluate referral patterns for the VFSS and management of the dysphagic patient.

Flow Mediated Dilation of the Brachial Artery: Methods Development and Effects of Exposure to Diesel Exhaust on Endothelial Function

Fiona N. Sands[1], Alon Peretz [1], Joel D. Kaufman[1,2], Daniel F. Leotta[3], Edward A. Gill[4], Jeffery H. Sullivan[1], Marla Paun[5], Carol A. Trenga[1], Sara Jarvis [1], Heidi Curtiss[1], Mary R. Aulet[1]

[1] Department of Environmental and Occupational Health Sciences, University of Washington, Seattle, Washington, USA

[2] Department of Medicine, University of Washington, Seattle, Washington, USA

[3] Department of Surgery, University of Washington, Seattle, Washington, USA

[4] Department of Medicine, Division of Cardiology, University of Washington, Seattle, Washington, USA

[5]Applied Physics Laboratory, University of Washington, Seattle, Washington, USA

To evaluate the mechanism by which particulate matter might cause cardiovascular health effects, endothelial function was assessed through ultrasonographic measurement of brachial artery reactivity. The hypothesis that exposure to inhaled diesel exhaust (DE) will result in concentration-related changes in endothelial homeostasis as reflected in flow mediated dilation (FMD) was evaluated using two method development pilot studies and a main study. Two of the studies used controlled inhalation exposure to DE particulate as a model with healthy subjects exposed to 2 hours of filtered air (FA), 100, and 200 $\mu g/m^3$ $PM_{2.5}$ DE followed by assessment of endothelial function. The third study assessed variability of FMD with varying cuff placement in repeated measurements (no exposure).

Data from the first pilot study and the main experiment (n = 10) were combined to examine controlled exposure to DE. The percent change in FMD for upper arm cuff placement suggested a trend to increased FMD after exposure (14.99% at FA, 16.88% at 200 $\mu g/m^3$). The percent change in brachial artery diameter for the subjects in which a pre-exposure measurement was made (n=5) were -0.47% for FA and -5.32% for 200 $\mu g/m^3$.

The variability of FMD with upper versus forearm cuff placement was assessed using data from the repeated measurements pilot and FA exposures from the main experiment (n = 26). FMD was larger for upper arm (16.2 ± 1.2%) compared to forearm (7.3 ± 0.9%) cuff placement ($p<0.0001$). Upper arm cuff placement was also found to be more variable (2.4%; 95% CI 0.5-4.3; $p=0.013$).

In summary, the effect of DE on FMD requires further exploration. However, distal cuff placement was determined to have statistical advantages over proximal as a method to assess endothelial function and should be used in further studies.

Sex steroids and vasoactive factors in endothelial cells

Lachlan J Pearson [1], Timothy G Yandle [2], M Gary Nichols [2], John J Evans [1]

[1] Department of Obstetrics and Gynaecology, Christchurch School of Medicine & Health Sciences

[2] Department of Medicine, Christchurch School of Medicine & Health Sciences

It is well documented that there are gender differences in the patterns of cardiovascular disease, but the reasons are unclear. Endothelial cells on the inner lining of blood vessels are in direct contact with circulating factors, and are also in contact with the smooth muscle layer. We hypothesised that sex steroids may modulate the secretions of these endothelial cells, which then may affect the activity of the smooth muscle layer by paracrine processes. The effects of sex steroids on the percentage of vascular endothelial cells that secrete the vasodilator peptide, adrenomedullin, and on the adrenomedullin-stimulating action of angiotensin-II were investigated using the cell immunoblot method. Cells were incubated with selected concentrations of angiotensin-II, oestradiol, and testosterone alone and in combination. The percentage of adrenomedullin-secreting cells was increased by angiotensin-II (100pM-10μM) in a concentration-dependant manner ($p<0.001$). Testosterone (3.5nM-3.5μM) at physiological concentrations was observed to increase the number of adrenomedullin-secreting cells ($p<0.001$) whilst oestradiol (3.7pM-3.7μM) had no effect. Testosterone and angiotensin-II together elicited a less than additive increase in the number of cells secreting adrenomedullin compared to the sum of their separate effects. It is concluded that testosterone increases the percentage of endothelial cells secreting adrenomedullin and augments the stimulating action of angiotensin-II. These results reveal another action of testosterone on vascular endothelial cells.

Postural hypotension in the mechanism of transient ischaemic attacks.

Dr's E. Ellis, D Jardine (Department of General Medicine) and Dr J Fink (Department of Neurology)

Postural hypotension (PH) is thought to be a rare contributing mechanism in the aetiology of transient ischaemic attacks (TIAs). However PH is common in the elderly and has recently been associated with stroke. We suspect that PH is frequently missed in TIA patients and so may be under-recognised in the pathophysiology of this condition.

The aim of this study is to undertake tilt-testing on patients presenting to Christchurch Hospital with anterior circulation TIAs; to determine the incidence of PH during head-up tilt; and to assess the association between tilt-induced hypotension and their TIA symptoms.

Patients over 60 years of age with anterior circulation TIAs were recruited from the emergency department, medical wards and neurology clinics. After consenting, patients were asked to fill out a questionnaire which included recent neurological

symptoms, postural symptoms and medication. Patients underwent 60-deg head-up tilt testing with continuous systolic blood pressure (SBP) monitoring using digital plethysmography. After 15 minutes of tilt, nitroglycerine spray (GTN) was administered. Patients remained tilted and were observed carefully for focal neurological signs as SBP fell. Patients were returned rapidly to the horizontal position in the event of focal neurological changes or impending syncope.

To date, 15 patients (7M/8F), mean age 77.4 yrs (range 65-85) have been tilted. 13 patients were taking anti-hypertensive medication. Mean SBP values (with ranges) were: Resting horizontal 138 mmHg (113-194); at 5 minutes tilt 149 mmHg (112-230); and when symptomatic (at BP nadir) 70 mmHg (48-114). TIA symptoms and signs were reproduced in 3 patients. SBP returned to baseline rapidly following tilt back to the horizontal and focal neurology normalised within 5 minutes.

Despite nearly all patients taking hypotensive medication, PH was not seen during early tilt. However hypotension reproduced TIA symptoms in 3 patients (20%), consistent with our hypothesis that some TIAs may occur secondary to a low flow, rather than an embolic mechanism. These preliminary findings also support previous studies that have found tilt-testing (with GTN challenge) to be safe in elderly patients with cerebrovascular disease.

Formation of Foam Cell From Human Monocyte-derived Macrophages in the Absence of Modified Low Density Lipoprotein

Zunika Amit, and Steven Gieseg

Free Radical Biochemistry Laboratory, School of Bioolgical Sciences, University of Canterbury

Foam cells are lipid loaded macrophages full of cholesteryl esters and are the dominant cells in atherosclerotic plaques. Most studies generate foam cells *in vitro* by feeding oxidised low density lipoprotein (OxLDL) to either cultures of animal macrophages or immortal macrophage-like cell lines. The exact nature of the foam cell formed in plaque or human monocytes in tissue culture is poorly defined.

This study aimed to develop foam cells from human monocyte-derived macrophages purified from human blood. Macrophages were incubated for up to 10 days in RPMI 1640 media containing 10% heat inactivated human serum with varying concentrations of LDL, OxLDL, aggregated LDL (AggLDL) or aggregated OxLDL (AggOxLDL). Changes in cellular cholesteryl ester concentration (as quantified by gas chromatography (GC) and high-performance liquid chromatography (HPLC)) and lipid staining using oil red-O was used to assess the degree of foam cell formation. All experiments condition were carried out in triplicate and all experiments were conducted on at least three different cell preparations.

Microscopic examination of oil red-O stained cells showed accumulation of lipid droplets during differentiation into macrophages. Treatment with modified LDL failed to change the oil red-O staining morphology of the cells. This was surprising as studies with non-human macrophages showed distinct changes in oil red-O staining after treatment with OxLDL. Measurement of lipid levels by GC, showed no significant different in free or total cholesterol levels of the control and modified LDL treated human macrophage cells. A more sensitive HPLC analysis showed an increased in cholesteryl esters levels of the macrophages only when the macrophages were incubated with AggLDL, OxLDL or AggOxLDL. This study suggests that modified LDL uptake is not required for the development of the foam cell morphology.

Something smells fishy: Preserving the nutritional value of aquacultured fish.

Nicholas Tuckey[1, 2], **Steven Gieseg**[1,2], **Malcolm Forster**[1,2]

[1] School of Biological Sciences, University of Canterbury

[2] Higher Value Seafoods, Seafood and Marine Extracts, Crop and Food Research

Harvesting procedures may play a role in reducing the quality and nutritional benefit of aquacultured seafood. Oxidation, particularly of the unsaturated fatty acids that make salmon a food source of high nutritional value, has long been thought to play a role in tissue degradation. Oxidized lipids are the primary source of the foul odour associated with degraded fish flesh and their consumption has been implicated in a number of diseases including atherosclerosis. Fillets from salmon harvested in a rested state using the aquatic anaesthetic AQUI-S and fillets from salmon that were exhausted and stressed prior to harvest, were exposed to normal atmospheric conditions and maintained at 15°C for up to 96 hours. Protein carbonyls began to increase immediately in the exhausted fillets and after a 6 hour delay in the rested fillets. This increase was resonably linear over the entire 96 hours with a total carbonyl increase of 300 nmol/g tissue. Both lipid peroxides (TBARS) and uric acid concentrations began to increase in the exhausted group after 30 hours, reaching a final concentration of 65 nmol TBARS/g tissue and 212 nmol/g tissue for uric acid. No significant increase in lipid peroxides or uric acid was seen in the fillets from the rested animals over the entire incubation. Vitamin E concentrations reduced slowly but did not change significantly despite the oxidation that was evident in the tissue. This work has shown that salmon harvested in a rested state with AQUI-S are less prone to lipid oxidation and potentially of a higher nutritional value.