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ACHORD

Alliance for Canadian Health Outcomes Research in Diabetes

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Alberta Diabetes Surveillance System

ACHORD has been working closely with Alberta Health and Wellness to implement the Alberta Diabetes Surveillance System (ADSS). The ADSS would provide information on the health status and health care utilization of people with diabetes in the province of Alberta. The ADSS will build on the National Diabetes Surveillance System which all provinces and territories already participate in. The ADSS would enhance that basic activity to produce an Alberta Diabetes Atlas, as well as an interactive website that would provide more timely information to health regions. The Atlas would compile data such as incidence rates, hospital or emergency room admissions for heart attack or stroke, and visits for ophthalmic care. This information could then be compared across health regions and provide a population health perspective on the overall care and management of diabetes within the province. Also proposed as part of the ADSS would be linkage of administrative data with data collected by laboratory services in the regions. This would allow collection of specific information such as frequency of assessments of glycosylated hemoglobin (A1c), fasting lipid profile and renal function which could be assessed at the regional level to profile local patterns of practice and could be used to inform quality improvement efforts.

The establishment of the ADSS is just another way that the ACHORD group continues to collaborate with policy decision makers to ensure the translation of research into enhanced quality of care for individuals with diabetes in Alberta.

ACHORD: Seen and Heard

Recent Publications

Padwal R, Majumdar SR, Johnson JA, Varney J, McAlister FA. A systematic review of drug therapy to delay or prevent type 2 diabetes. *Diabetes Care.* 2005;28:736-744.

Johnson JA, Simpson SH, Toth EL, Majumdar SR. Reduced cardiovascular morbidity and mortality associated with metformin use in subjects with type 2 diabetes. *Diabet Med.* 2005;22:497–502.

Johnson JA, Eurich DT, Toth EL, Lewanczuk RZ, Lee TK, Majumdar SR. Generalizability and persistence of a multifaceted intervention for improving quality of care for rural patients with type 2 diabetes. *Diabetes Care.* 2005;28:783-788.

Brown LC, Majumdar SR, Newman SC, Johnson JA. History of depression increases risk of type 2 diabetes in younger adults. *Diabetes Care.* 2005;28:1063-1067.

Recent Presentations

Johnson JA, Majumdar SR, Bowker SL, Toth EL, Edwards A. Reducing financial barriers to test strips is not associated with better glycemic control in type 2 diabetes: results of a randomized controlled trial of reimbursement policy. SGIM, New Orleans, LA, May 12-15, 2005. *J Gen Intern Med.* 2005;20:138.

Brown LC, Majumdar SR, Newman SC, Johnson JA. Type 2 diabetes does not increase risk of depression. APA meeting, Atlanta, Georgia, May 21 - 26, 2005.

Brown LC, Majumdar SR, Newman SC, Johnson JA. History of Depression Increases Risk of Type 2 Diabetes in Younger Adults. APA meeting, Atlanta, GA, May 21 - 26, 2005.

Bowker SL, Majumdar SR, Veugelers P, Johnson JA. Increased Cancer-Related Mortality for Patients with Type 2 Diabetes Who Use Sulfonylureas or Exogenous Insulin Compared to Metformin. ADA meeting, June 10-14, 2005, San Diego, CA. *Diabetes.* June 2005;54 (Suppl 1):A128

Eurich DT, Majumdar SR, McAlister FA, Tsuyuki RT, Johnson JA. Improved Clinical Outcomes Associated with Metformin in Diabetic Heart Failure Patients: The Other Side of the Patient Safety Coin. ADA meeting, June 10-14, 2005, San Diego, CA. *Diabetes.* June 2005;54 (Suppl 1):A113

Report from the Chair

Jeffrey A. Johnson

It has been a busy few months for the people of ACHORD, both personally and professionally. We were very pleased to receive word from CIHR and the partners that the final two years of funding for our 5-year New Emerging Team grant was approved, based on the success we have achieved in the past three years. This will allow us to continue to develop the research network, and host our now regular annual meetings and retreats for ACHORD Investigators and Collaborators.

Our success has been reflected in recent student awards for ACHORD Trainees. Dean Eurich received a CIHR scholarship which will provide support for his research on diabetes and heart failure. Dean and I are off to San Diego for the American Diabetes Association meeting this month, to present some of our ongoing research. Lauren Brown received the Best Student Poster award at the recent Public Health Sciences Research Day 2005 at the University of Alberta. In May, Lauren had the opportunity to present some of her recent work on diabetes and depression at the Center for Disease Control in Atlanta. Samantha Bowker was awarded a CDA Doctoral Student Research Award and an AHFMR Studentship, which will support her upcoming PhD work on diabetes and cancer.

I am also happy to report that Dr. Scot Simpson received a New Investigator award from CIHR, to begin this summer. This 5-year salary award will allow Scot to focus time on his research, and in particular, the Vascular Intervention Program (VIP), in collaboration with the Capital Health Regional Diabetes Program. Over the next few months I will continue to work with our colleagues in Alberta Health and Wellness toward the development of a provincial diabetes management program. These efforts in making this translation of our research results will have benefits for the health and health care of Albertans.

Project Highlights: Clinical Outcomes Associated with the use of Metformin in Patients with Heart Failure and Type 2 Diabetes.

Contrary to existing evidence, our study suggests metformin is associated with improved outcomes in patients with heart failure and diabetes.

Heart failure is a common, serious, and often forgotten comorbidity of diabetes resulting in significant morbidity and mortality. However, clinicians treating patients with heart failure and diabetes find their options limited since metformin is considered “absolutely” contraindicated in this population. While the contraindication to metformin arose over concerns about the potential for lactic acidosis, there is a paucity of evidence that actually links lactic acidosis and metformin.

By corollary, two decades ago, beta-blockers were considered contra-indicated and ‘inappropriate’ in beta-blockers but since have become a cornerstone of treatment in heart failure patients.. Like beta-blockers, it could be that ‘inappropriate’ use of metformin in heart failure may actually be associated with improved outcomes relative to other antidiabetic therapies.

Our study was designed to examine outcomes in a broad, unselected population based cohort of patients with heart failure and type 2 diabetes who are treated with metformin or other oral antidiabetic medications. Subjects with incident HF (n=1,833) were classified according to antidiabetic therapy: metformin monotherapy (n=208), sulfonylurea monotherapy (n=773), or combination therapy (n=852). Multivariate Cox proportional hazards models were used to assess differences in all-cause mortality, all-cause hospitalization, and the combination (i.e., all cause hospitalization or mortality).

After an average of 2.5 years of follow-up, compared to sulfonylurea therapy, metformin therapy was associated with significantly fewer deaths [30 percent lower for metformin monotherapy and 39 percent lower for combination therapy] and fewer deaths or hospitalizations combined [17 percent lower for metformin monotherapy and 14 percent for combination therapy]. Importantly, we also found that metformin exposure was not associated with an increase in hospitalizations.

Conventional wisdom and practice guidelines have created a practice environment where all of the patients in our study who were taking metformin would be considered to be victims of “inappropriate” or “unsafe” prescribing. And yet, we found that vulnerable patients exposed to metformin had lower mortality, less morbidity, and fewer hospitalizations than patients exposed to the much more commonly prescribed sulfonylureas. It is important to consider, however, that the currently available evidence supporting the use of metformin in patients with heart failure is based solely on observational data. Thus, it may be premature to suggest that metformin is effective and safe in this population. As a result, we are currently designing a randomized placebo controlled trial to examine outcomes in patients with heart failure and diabetes treated with metformin therapy. A pilot study to assess the feasibility of this trial will be initiated in September 2005.

Recent Literature:

Di Loreto, C., et al. Make your diabetic patients walk: Long-term impact of different amounts of physical activity on type 2 diabetes. Diabetes Care, 2005;28:1303-1310.

What was the study about?

This study evaluated the long-term dose-response relationship between varying levels of physical activity and physiological, biochemical, and cost outcomes in 179 patients with type 2 diabetes who received physical activity counseling. The specific outcomes of interest were: 10-year CHD risk, body weight, BMI, waist circumference, fasting glucose, HbA_{1c}, blood pressure, cholesterols, and costs (both medical and social). Patients were counseled to increase their weekly physical activity levels by the equivalent of 30 or more minutes of moderate-intensity physical activity on most days of the week. Patients were asked to keep track of their physical activity levels for two years and at the end of the study, were divided into six groups based on how much their weekly activity levels had increased relative to baseline.

What were the results of the study?

Patients who did not increase their activity levels had higher direct medical and indirect costs. Patients who increased their activity levels somewhat (but not enough to meet the study target) had no change in any of the health or cost outcomes. Physical and cost outcomes improved in patients who reported levels of physical activity that exceeded the study target. This relationship was dose-dependent, but only up to a certain level of activity. Maximum improvements in the outcomes were observed in the group who increased their activity levels by the equivalent of a 5 km daily walk at a pace of approximately 5 km/h. There were no additional benefits observed in patients who reported even greater levels of physical activity. The most common type of exercise reported by these study participants was brisk walking.

What are the implications of the study?

This study suggests that patients with type 2 diabetes can benefit from increases in physical activity, even if the increases are small at first. Furthermore, the finding that the health benefits of exercise can "peak" at a certain level can be reassuring to discouraged patients who believe that they need to perform hours of strenuous exercise in order to achieve health benefits. Because 69% of the study participants were able to achieve target physical activity levels over the two-year study period, and given that walking was the most commonly-reported type of exercise performed, this study suggests that brisk walking for exercise can be recommended to patients who are not limited by lower-limb problems.

CV risk factors and health care costs are lower with more physical activity for patients with type 2 diabetes.

Meet the Staff: Dean Eurich, BSP, MSc

Dean Eurich completed his Bachelor of Science in Pharmacy at the University of Saskatchewan in 1998. He then completed a hospital residency at the Regina General Hospital in Saskatchewan. Following his residency, Dean practiced as a clinical pharmacist in the cardiovascular and trauma intensive care unit at the Regina General Hospital for 1 year before accepting a position as a research coordinator for a heart failure study conducted by Dr. Ross Tsuyuki. After completion of the study, Dean moved to Alberta and enrolled in the Masters of Science program at the University of Alberta under the supervision of Dr. Jeffrey Johnson. Building on evidence generated in the HOPE study, his Masters thesis evaluated the benefits of angiotensin converting enzyme (ACE) inhibitors for primary prevention in a low cardiovascular risk population of patients with type 2 diabetes.

Upon completion of his MSc degree, Dean enrolled in the PhD program in Public Health Sciences at the University of Alberta. As part of this PhD dissertation, he is currently completing several projects related to the use of metformin therapy in patients with heart failure and type 2 diabetes. The final aspect of his dissertation research will be to conduct a pilot study to evaluate the feasibility of a large randomized placebo controlled trial of metformin in patients with heart failure and type 2 diabetes. It is anticipated this pilot work will begin in September 2005. Dean has recently received a CIHR Doctoral scholarship for this work.

Dean is also a part-time Research Associate with ACHORD and the Institute of Health Economics and is practicing part-time as a pharmacist at the University of Alberta Hospital.

Dean Eurich

ACHORD Chair

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University of Alberta
Institute of Health Economics

Staff & Research Trainees

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Ms. Lauren Brown
Mr. Dean Eurich
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Why this Newsletter?

The purpose of the ACHORD Newsletter is to keep you updated on the activities of the ACHORD group and to provide reviews of recent, relevant diabetes literature. The newsletter is published three times a year.

You can expect to see the following in every issue:

- *Report from the Chair*
- *Meet the Staff/Trainee*
- *ACHORD Project Highlights*
- *ACHORD Seen and Heard*
- *Review of Recent Literature*

If you have any questions about the newsletter, please call Jeffrey Johnson or any of the ACHORD staff at the Institute of Health Economics at (780) 448-4881.

Diabetes Events

CDA/CSEM Professional Conference and Annual Meeting, October 19-22, 2005,

Edmonton, Alberta