

Diabetes & Obesity Research Review™

Making Education Easy

Issue 25 - 2009

In this issue:

- *Metabolic syndrome and salt sensitivity of BP*
- *Framingham/UKDPS CV risk equations in FDS*
- *Weight loss to treat urinary incontinence*
- *Undiagnosed diabetes, IGT and IFG among Māori*
- *Prevention and management of diabetes admissions*
- *Nondiabetic hyperglycaemia and CV disease/all-cause mortality*
- *Diabetes complications risks in different NZ ethnic groups*
- *Insulin analogues vs. conventional insulins*
- *Proximity of fast-food restaurants to schools*
- *Diabetes remission after gastric bypass*

Welcome to the latest edition of Diabetes and Obesity Research Review.

This month's selection from the latest research in diabetes and obesity includes papers looking at how well diabetes is being managed in NZ. Urinary incontinence is an often overlooked comorbidity associated with obesity, and one of this month's studies found that reducing bodyweight also reduces the incontinence. We also see that cardiovascular (CV) risk equations in common use do not measure up to expectations in Australian patients, and ask whether the same applies here. There is also a US study, which we should be taking note of here in NZ, linking the proximity of fast-food outlets to schools with obesity in their students.

As always, we welcome your feedback and hope you enjoy reading the Review.

Best regards,

Dr Jeremy Krebs

jeremykrebs@researchreview.co.nz

Metabolic syndrome and salt sensitivity of blood pressure in non-diabetic people in China

Authors: Chen J et al

Summary: The relationship between metabolic syndrome and salt sensitivity of blood pressure (BP) was investigated in participants without diabetes who consumed a low-sodium diet for 7 days (n=1853) followed by a high-sodium diet for 7 days (1845). Participants with metabolic syndrome (n=283) had significantly greater changes in mean BP than those without metabolic syndrome during both the low- and high-sodium diets. In participants with 4-5 metabolic syndrome risk factors, the odds of high salt sensitivity associated with the low- and high-sodium diets were increased by 3.54-fold and 3.13-fold, respectively, compared with participants with no metabolic syndrome risk factors.

Comments: Salt restriction has long been advocated for the management of hypertension. This study provides additional evidence to underpin this advice, and additionally makes the observation that those with the metabolic syndrome appear to be more sensitive to the hypertensive effects of a high salt intake. Being a cross-sectional study, it cannot answer the question whether such a salt sensitivity predisposes to the metabolic syndrome itself, or whether having the metabolic syndrome enhances or reveals an underlying salt sensitivity. The findings of this study should stimulate prospective studies to address this and whether attention to salt restriction in this group is especially effective.

Reference: Lancet 2009; 373(9666): 829-35

[http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(09\)60144-6/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(09)60144-6/abstract)

COMING SOON to South Africa

SUBSCRIBE NOW TO RECEIVE YOUR COPY

This publication is a sample copy from New Zealand. The opinions expressed are specific to the New Zealand health environment. South African versions will be available soon.

Comparison of the Framingham and United Kingdom Prospective Diabetes Study cardiovascular risk equations in Australian patients with type 2 diabetes from the Fremantle Diabetes Study

Authors: Davis WA et al

Summary: This study evaluated the respective performances of the Framingham and UKPDS CV risk equations in 697 and 791 participants with type 2 diabetes from the Fremantle Diabetes Study (FDS). The UKPDS risk assessment equations overestimated the number of events among the participants during follow up (first event, death or 5 years) by factors of 6.5 for coronary heart disease (CHD), 2.8 for fatal CHD and 1.8 for stroke, and the number of fatal stroke events predicted by the risk equation was 38% lower than the actual number. The investigators concluded that the UKPDS CHD risk equations were associated with 'modest discrimination and poor calibration', while the stroke risk equations had 'good discrimination and calibration'. The Framingham risk equations showed 'poor discrimination and calibration', with 93 CHD events predicted and 130 actual events.

Comments: Macrovascular disease and particularly coronary artery disease is the primary cause of mortality in patients with diabetes. Much of our efforts in managing diabetes are directed to identify those at greatest risk and intensify management of risk factors. There are many CV disease risk calculation equations available, but most are based on Framingham data. There has been debate over how applicable this is to other populations, and this study is important as it shows that neither the Framingham equation nor the UKPDS equation were good at predicting events in Australia. It begs the question whether they perform any better in NZ?

Reference: *Med J Aust* 2009; 190(4): 180-4

http://www.mja.com.au/public/issues/190_04_160209/dav10014_fm.html

Weight loss to treat urinary incontinence in overweight and obese women

Authors: Subak LL et al

Summary: In this study, overweight or obese women with urinary incontinence were randomly assigned to a 6-month intensive weight loss programme (including diet, exercise and behaviour modification; n=226) and lost a mean of 8.0% bodyweight, while women assigned to a structured education programme (controls; n=112) achieved a mean bodyweight loss of 1.6% (p<0.001). Moreover, the women in the intensive intervention group experienced a greater reduction in their frequency of incontinence episodes than those in the control group (47 vs. 28%; p=0.01), with a greater proportion of women in the intervention group achieving a clinically relevant reduction ($\geq 70\%$) in the frequency of incontinence episodes. The decrease in frequency of stress incontinence episodes was also greater in the intervention group than the control group (p=0.02). Although the between-group difference for the reduction in urge incontinence episode frequency was not significant, a greater proportion of women in the intervention group achieved a clinically relevant reduction in frequency (p=0.04).

Comments: There are many comorbidities associated with obesity, and one which is often not raised is urinary incontinence. This can be particularly troublesome for many women and has a major impact on quality of life. The findings of this study are therefore important as they identify an additional benefit/reason for promoting weight loss in obese women. It is unclear from the study whether the benefit is purely due to weight loss or whether the increased physical activity has an independent effect. This would be worth teasing out further to assist with practical advice and to focus efforts at lifestyle change where there is most to gain in these patients.

Reference: *N Engl J Med* 2009; 360(5): 481-90

<http://content.nejm.org/cgi/content/abstract/360/5/481>

Prevalence of undiagnosed diabetes, impaired glucose tolerance, and impaired fasting glucose among Māori in Te Wai o Rona

Authors: Simmons D et al

Summary: This study of 3817 Māori participants from the Waikato/Lakes areas found that the prevalence of undiagnosed diabetes among Māori men was 6.5%, compared with 4.2% for women. Similarly, the prevalence of undiagnosed impaired fasting glucose (IFG) was greater for men (5.4 vs. 3.0%), but the prevalence of impaired glucose tolerance (IGT) was similar for men and women (8.5 vs. 9.7%). Dysglycaemia prevalence increased with increasing BMI, and it was 1.33 times more prevalent among participants with a community services card.

Comments: In the absence of a national diabetes prevalence study, it is great to have some up-to-date NZ data, and in particular in Māori who we know are at greater risk of developing diabetes than NZ Europeans. This study shows a relatively high rate of undiagnosed diabetes and prediabetes in Māori, especially in Māori men. The overall age standardised population rate of known diabetes in adults aged >25 years is estimated at 4.5%. It has been estimated by the MOH to be around three times higher in Māori. Therefore, it is interesting that even the rate of undiagnosed diabetes, let alone prediabetes, in this Māori population was higher than the total estimated population prevalence. As the authors state, there remains a major challenge and opportunity in this population.

Reference: *NZ Med J* 2009; 122(1288): 30-8

<http://www.nzma.org.nz/journal/abstract.php?id=3432>



Independent commentary
by Dr Jeremy Krebs



PHARMACY GUILD OF NEW ZEALAND (INC)



NEW ZEALAND MEDICAL ASSOCIATION

COMING SOON to South Africa

SUBSCRIBE NOW TO RECEIVE YOUR COPY

This publication is a sample copy from New Zealand. The opinions expressed are specific to the New Zealand health environment. South African versions will be available soon.

Hospital admissions for people with diagnosed diabetes: challenges for diabetes prevention and management programmes

Authors: Jackson G et al

Summary: The proportion of Counties/Manakau DHB inpatient discharges mentioning 'diabetes' (13%) in 2007 was comparable with national data (12%), although the relative number was greater, reflecting the greater population of individuals with diabetes in that region. However, among such discharges in patients aged 45–64 years, 38% were Pacific, 31% were Māori and 31% were Indian, compared with 10% for Europeans and other ethnicities. There was also a substantial increase in the rate of admissions per 1000 in patients with diabetes from 1996 to 2007, particularly among patients of Māori (31%) and Pacific (52%) ethnicities. The annual hospital costs associated with admissions for individuals with diabetes in the Counties/Manakau region were estimated to be \$66 million higher than for patients without diabetes.

Comments: Diabetes is an important factor in admissions to hospital and also on length of stay. People with diabetes have greater admission rates and longer lengths of stay than those without diabetes, which has significant personal costs and resource costs to the health system. This is reflected in this study from Counties Manukau. Although no population denominator is given, the rates of admission appear to be higher for non-European ethnicities, which may be a reflection of the observed differences in access of health services or the increased rates of diabetes complications. It certainly warrants further analysis to be able to underpin strategies to reduce these disparities.

Reference: *NZ Med J* 2009; 122(1288): 13–21

<http://www.nzma.org.nz/journal/abstract.php?id=3430>

Subscribing to Research Review

To subscribe to Research Review publications go to www.researchreview.co.za

Continuous relationships between nondiabetic hyperglycaemia and both cardiovascular disease and all-cause mortality: the Australian Diabetes, Obesity, and Lifestyle (AusDiab) study

Authors: Barr ELM et al

Summary: Among 10,026 patients without a diagnosis of diabetes (aged ≥ 25 years) from the population-based Australian Diabetes, Obesity, and Lifestyle (AusDiab) study, there were 332 deaths from any cause and 88 CV disease-related deaths. Significant predictors of all-cause mortality were fasting plasma glucose (FPG) and 2-hour plasma glucose, but not glycosylated haemoglobin (Hb_{A1c}). FPG, 2-hour plasma glucose and Hb_{A1c} were all significant predictors of CV-related mortality. However, identification of at-risk individuals was not substantially improved with these measures.

Comments: At the risk of sounding like a broken record, I included this study. There is a wealth of evidence that blood glucose levels are correlated with CV outcomes across the continuum of levels including down into the 'reference range'. There is debate (as yet unresolved) over the relative contribution of fasting versus postprandial glucose, and the role of Hb_{A1c} as a marker of glycaemia, as predictors of cardiovascular disease. These data from a large population longitudinal study adds to this debate. They support glycaemia being an important risk factor in CV disease, but in this population the effect was relatively small and did not add to the predictive power of traditional risk factors.

Reference: *Diabetologia* 2009; 52(3): 415–24

<http://tinyurl.com/diabetologia-52-415>

Trends in the management of risk of diabetes complications in different ethnic groups in New Zealand primary care

Authors: Agban H et al

Summary: Among 7782 NZ patients with diabetes with baseline data in 2002–2003, it was found that 47% of Māori and 69% of Pacific patients had poor baseline glycaemic control, and only small improvements were achieved over 2 years. However, there were significant improvements in BP and lipid management in all ethnic groups over 2 years, with >75% of Māori and Pacific patients receiving appropriate treatment. There was also reduction in many of the baseline ethnic disparities in risk factors for complications.

Comments: The 'Get Checked' programme has given us the chance to look longitudinally at the management of diabetes across NZ. It would be ideal if all the data were collated and analysed centrally to give us national data on rates of diabetes, complications, treatment and change over time. However, to date we have had to be happy with data from smaller collective practice/PHO groups. This study is another of these, with a focus on the ethnic differences in outcomes over 2 years. There have been improvements, particularly for Māori and Pacific patients, with reductions in disparities. One of the main limitations of this form of epidemiological assessment is that it is very likely that those not doing well are those not engaged in the 'Get Checked' programme. Whilst the MOH give us 'modelled' denominators, it is clear, at least for Pacific patients, that these models are inaccurate. Despite this, it can be concluded that for those patients who engage with 'Get Checked', improvements in overall care accrue over time for all ethnicities.

Reference: *Prim Care Diabetes* 2008; 2(4): 181–6

[http://www.primary-care-diabetes.com/article/S1751-9918\(08\)00076-4/abstract](http://www.primary-care-diabetes.com/article/S1751-9918(08)00076-4/abstract)

COMING SOON to South Africa

SUBSCRIBE NOW TO RECEIVE YOUR COPY

This publication is a sample copy from New Zealand. The opinions expressed are specific to the New Zealand health environment. South African versions will be available soon.

Efficacy and safety of insulin analogues for the management of diabetes mellitus

Authors: Singh SR et al

Summary: This meta-analysis compared insulin analogues with conventional insulins for the management of type 1, type 2 and gestational diabetes. There was little difference between rapid-acting insulin analogues and regular human insulin for effects on glycosylated haemoglobin (Hb_{A1c}) in type 1 and type 2 diabetes and differences between long-acting insulin analogues and neutral protamine Hagedorn insulin were marginal. Reduced hypoglycaemia benefits were inconsistent, and there were insufficient data on long-term diabetes-related complications and mortality to form any conclusions.

Comments: We all strive to use evidence-based medicine to guide our practice, but sometimes much is lost in the process of generating this evidence base! I believe that this meta-analysis is an example of that. I'm sure all of us have plenty of examples of patients in whom the transfer from regular short-acting insulin to short-acting analogues, and/or from NPH insulin to long-acting analogues has made a profound difference to rates and severity of hypoglycaemia and quality of life. I would agree that this seldom translates to major improvements in Hb_{A1c}. This should not diminish the value of these agents. Conducting insulin studies is notoriously difficult, with it being almost impossible to adequately blind investigator or patient to treatment, so I would agree with the conclusion that well designed long-term studies assessing overall outcomes are important. The trick in clinical practice is picking the patients who will benefit over those who won't! Now, that's the 'art' of medicine.

Reference: *CMAJ* 2009; 180(4): 385-97

<http://www.cmaj.ca/cgi/content/full/180/4/385>

Proximity of fast-food restaurants to schools and adolescent obesity

Authors: Davis B et al

Summary: This US study investigated the relationship between the proximity of fast-food outlets to schools and obesity in >500,000 adolescents. A fast-food outlet within half a mile of a school was associated with a greater likelihood of the school's students being overweight (OR 1.06; 95% CI 1.02, 1.10) or obese (1.07; 1.02, 1.12) compared with students from schools that were not near a fast-food outlet. Students from schools near a fast-food outlet also consumed fewer servings of vegetables and fruit and more servings of soda. The findings were specific to fast-food outlets and did not apply to other establishments near a school. The investigators commented that reductions in adolescent obesity might be facilitated by policy interventions that limit how close fast-food establishments can be located to schools.

Comments: Would the present government please take note! Like it or not, as a species we are not good at making healthy food choices when bombarded with opportunities to make unhealthy ones – particularly if we are genetically challenged! I was very disappointed to hear what I regard as a backward step in the fight against obesity when the decision was made to remove the requirement for schools to sell only healthy food. The social and economic costs of obesity are increasing exponentially, despite an abundance of messages educating the population on the need to adopt a healthier lifestyle. Such approaches are failing, and a stronger approach is required no matter how unpalatable or counter to one's ideology this may be.

Reference: *Am J Public Health* 2009; 99(3): 505-10

<http://www.ajph.org/cgi/content/abstract/99/3/505>

Endocrine mechanisms mediating remission of diabetes after gastric bypass surgery

Authors: Cummings DE

Summary: This review reported on the effects of roux-en-Y gastric bypass (RYGB) in patients with diabetes, which resolves completely in 84% of patients who undergo the procedure, and nearly all experience improved glycaemic control. The author noted that the antidiabetic actions associated with RYGB are independent of bodyweight as: 1) diabetes resolves before bodyweight loss occurs; 2) glucose homeostasis is improved to a greater degree for bodyweight loss associated with RYGB than it is for the same amount of bodyweight loss triggered by other means; and 3) very late-onset pancreatic β -cell hyperfunction occasionally develops. Several mechanisms involved in this effect are presented, but the author noted that others are probably yet to be revealed, and further research into these mechanisms may also uncover new pharmacological targets for the treatment of diabetes.

Comments: It is a remarkable observation that in the absence of weight loss, gastric bypass surgery is able to reverse the metabolic effects of obesity virtually immediately. This implies some critical signalling between the upper gut and the organs involved in carbohydrate and lipid metabolism. The nature of this is one of the current hot areas of research. This review paper gives a very good account of these issues, and summarises the current theories for the explanation of the observation and the evidence for them. For anyone with an interest in the field, this is a worthwhile review to read.

Reference: *Int J Obes* 2009; 33(Suppl 1): S33-S40

<http://www.nature.com/ijo/journal/v33/n1s/abs/ijo200915a.html>

Privacy Policy: Research Review will record your details on a secure database and will not release it to anyone without prior approval. You have the right to inspect, update or delete your details at any time.

Disclaimer: This publication is not intended as a replacement for regular medical education but to assist in the process. The reviews are a summarised interpretation of the published study and reflect the opinion of the writer rather than those of the research group or scientific journal. It is suggested readers review the full trial data before forming a final conclusion on its merits.

COMING SOON
Rheumatology RESEARCH REVIEW
Anaesthesia RESEARCH REVIEW
Foot and Ankle RESEARCH REVIEW

Go to www.researchreview.co.za
to update your subscriptions



COMING SOON
to South Africa
SUBSCRIBE NOW
TO RECEIVE YOUR COPY

This publication is a sample copy from New Zealand.
The opinions expressed are specific to the
New Zealand health environment.
South African versions will be available soon.