

Diabetes & Obesity Research Review™

Making Education Easy

Issue 93 – 2015

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Abbreviations used in this issue

HbA_{1c} = glycosylated haemoglobin
NPH = neutral protamine Hagedorn
VDR = virtual diabetes registry

Welcome to issue 93 of Diabetes and Obesity Research Review.

This month's issue includes several studies reporting on various aspects of diabetes and obesity management in NZ. These include the impact of more diagnoses of gestational diabetes when international diagnostic criteria are used, a report on the development of an NZ VDR (virtual diabetes registry), dietary differences among different NZ Asian populations, the effectiveness of telemedicine for managing chronic conditions (including diabetes), public support for policies to combat obesity, a real-world look at initiation of insulin therapy for type 2 diabetes, and the roles of various types of primary healthcare nurses in managing patients with diabetes.

I hope you enjoy this issue, and I look forward to receiving any thoughts and suggestions.

Best regards,

Associate Professor Jeremy Krebs
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Impact of using the international association of diabetes and pregnancy study groups criteria in South Auckland: prevalence, interventions and outcomes

Authors: Ekeroma AJ et al.

Summary: These researchers investigated the impact of adopting the modified IADPSG (International Association of Diabetes and Pregnancy Study Groups) criteria for gestational diabetes for 6376 pregnant women who delivered at Counties Manukau DHB over a 12-month period. The gestational diabetes prevalence was 4 percentage points greater with the IADPSG-additional criteria than the 6% prevalence according to NZSSD (New Zealand Society for the Study of Diabetes) criteria, equating to a relative 62% increase. The characteristics of the women identified as having gestational diabetes by the two sets of criteria were similar, as were outcomes with the exceptions of a higher rate of labour induction among women with gestational diabetes according to NZSSD and a higher mean birthweight of neonates born to women diagnosed with gestational diabetes according to IADPSG-additional.

Comment: The most appropriate criteria for the diagnosis of gestational diabetes is one of the most controversial areas of clinical diabetes at present. Opinions based on the same data vary considerably. An NZ guideline was produced in 2014 after much discussion and consultation, and whilst a consensus was reached, there is still disagreement between many of the country's experts. This study highlights some of the basis for this disagreement. Here the agreed NZ criteria were compared with the IADPSG criteria for women who delivered in Counties Manukau DHB over a 12-month period. Adopting the IADPSG criteria would increase the incidence of gestational diabetes by 62%. This has enormous implications for the women, the midwifery system, hospital specialist services, etc. If there was overwhelming evidence that this would have a major improvement in pregnancy outcomes then perhaps it could be justified. However, I don't believe that such evidence currently exists.

Reference: *Aust N Z J Obstet Gynaecol* 2015;55(1):34-41

[Abstract](#)

Development of a virtual diabetes register using information technology in New Zealand

Authors: Jo EC & Drury PL

Summary: These authors described the use of a VDR system in NZ using data from five national databases. The algorithm has been progressively modified to improve sensitivity and specificity, has been validated against primary care registers and was still in use in 2014. Diabetes had been diagnosed in 4.4% of the NZ population on December 31, 2009; the VDR is now used to determine the official prevalence of diabetes diagnoses in NZ and also to determine the denominator of the desirable health targets that the MOH (Ministry of Health) sets for diabetes service indicators.

Comment: It is often said that NZ has excellent health system data, which are enabled by a unique individual identifier – the NHI number. However, we have been guilty of underutilising this position and harnessing the potential for monitoring the effectiveness of the health system to manage chronic diseases such as diabetes. Conducting a national prevalence study is expensive and limited to a snapshot in time. However, by using existing and available data from multiple sources, it is possible to perform a virtual prevalence study. More usefully, the register generated from this can be utilised to track trends in prevalences, treatments and outcomes over time. Therefore all the hard work that has gone into generating the NZ VDR has been invaluable. Whilst there may still be some minor discrepancy in prevalence when comparing the VDR and an individual primary-care practice record system, at a population, regional and PHO (Primary Health Organisation) basis, the VDR is still an excellent tool.

Reference: *Healthc Inform Res* 2015;21(1):49–55
[Abstract](#)



A profile of New Zealand 'Asian' participants of the 2008/09 Adult National Nutrition Survey: focus on dietary habits, nutrient intakes and health outcomes

Authors: Parackal SM et al.

Summary: Similarities and differences in dietary habits, nutrient intakes and health outcomes among NZ residents of South Asian, East/Southeast Asian and NZ European/other descent were explored using nutrient intake questionnaire data and dietary habits, anthropometry and biochemical analyses data from the cross-sectional 2008/2009 Adult National Nutrition Survey. Compared with NZ European/other, South Asians were more likely to report nil red meat consumption ($p < 0.001$), and lower consumption of fats and micronutrients such as riboflavin, vitamin B₆, vitamin B₁₂ and selenium. Compared with East/Southeast Asians and NZ European/other women, South Asian women had lower intakes of zinc and vitamin B₁₂ ($p < 0.05$). Using ethnic-specific cutoffs, a higher proportion of South Asians were obese, had lower indices of iron status and had less diagnosed diabetes than NZ European/other and East/Southeast Asians. Compared with long-term South Asian migrants, those who arrived more recently consumed more β -carotene, vitamin C and calcium ($p < 0.05$).

Comment: The prevalence of obesity and of type 2 diabetes varies considerably by ethnicity in NZ. Understanding the reasons for this is important to enable the tailoring of interventions to individuals. We often combine similar ethnic groups when doing population-level comparisons. For example Pacific may include individuals from Samoa, Tonga, Rarotonga, Niue and other. Similarly, we combine many disparate populations from the Asian region. Whilst often helpful, this can also disguise subtle internal differences that may be as great as those we see between these groups and Europeans. This study utilising the National Nutrition Survey data from 2008/2009 highlights this point. Here there are important differences in diets between Asian subgroups, which should inform the advice given to them. Ah, the complexity of it all!

Reference: *Public Health Nutr* 2015;18(5):893–904
[Abstract](#)

Telecare for diabetes, CHF or COPD: effect on quality of life, hospital use and costs

Authors: Kenealy TW et al.

Summary: NZ patients with long-term conditions (e.g. diabetes, congestive heart failure, chronic obstructive pulmonary disease) were randomised to receive 3–6 months of usual care with (n=98) or without (n=73) entry of their data into a commercially-available electronic device that uploaded data every day to a nurse-led monitoring station; participants with diabetes were assigned only to the intervention arm. The intervention had no significant impact on quality of life, self-efficacy, disease-specific measures, hospital admissions, days in hospital, emergency department visits, outpatient visits or costs, but anxiety and depression decreased significantly. Many participants reported feeling safer, more 'cared for' and better educated about managing their condition. Many staff indicated they could monitor more patients using telecare, despite some initial technical problems.

Comment: Internationally the concept of self-management is hot property. It is appreciated that in chronic conditions such as diabetes, unless individuals with the disease are fully engaged in their own care, it is unlikely that good outcomes can be consistently achieved. Enabling self-management is a challenge that everyone is grappling with. Telemedicine is a tool that can facilitate patient participation and reduce the burden of time and travel on both patients and healthcare professionals. This study reported on one aspect of this where individuals uploaded health data into a system that was monitored remotely by a nurse. The outcomes were an improvement in several aspects of quality of life, but no difference in some of the harder endpoints such as hospital admissions, outpatient visits, etc. As is often the case with similar interventions, the benefits are important in the life of an individual, but are not reflected in the costs to the health system and are therefore hard to justify at a funder level.

Reference: *PLoS One* 2015;10(3):e0116188
[Abstract](#)

Should support for obesity interventions or perceptions of their perceived effectiveness shape policy?

Authors: Gendall P et al.

Summary: Support for 15 possible measures for reducing overweight and obesity was explored among 534 New Zealanders using an online survey. The respondents indicated that measures encouraging individuals to undertake more exercise and adopt a better diet were well supported, but they also viewed greater personal responsibility as less effective than environmental interventions (e.g. reducing the costs of healthy food and exercise, and limiting the availability of unhealthy foods).

Comment: Everyone agrees that obesity is an important issue, and that there are major health consequences and costs associated with the growing prevalence of obesity. We can also agree that at a fundamental level the cause of obesity is excess energy intake relative to expenditure. Where things become unstuck is when we ask why this occurs and who is responsible. This study in New Zealanders follows a similar study conducted in the US to explore popular views on responsibility and also on the likely effectiveness of different interventions. There is a curious disconnect between the two. There continues to be a majority view that obesity is the fault of the individual, whereas there is an appreciation that more environmental and system interventions are more likely to be effective in reducing obesity. It is the latter view that has more supportive evidence and needs to gather more public momentum and voice to change the focus of the government and funders if we are to make inroads on the 'obesity problem'.

Reference: *Aust N Z J Public Health* 2015;39(2):172–6
[Abstract](#)

Efficacy of a basal bolus insulin protocol to treat prednisolone-induced hyperglycaemia in hospitalised patients

Authors: Burt MG et al.

Summary: In this cross-sectional study, patients with type 2 diabetes admitted to a general medical ward received ≤ 5 days of basal bolus insulin, including 24 participants who received prednisolone ≥ 10 mg/day for acute inflammatory disease and 42 prednisolone nonrecipients (controls). Compared with controls, prednisolone recipients had a higher mean daily glucose level (12.2 vs. 10.0 mmol/L [$p < 0.001$]), with higher levels seen at 1700h and 2100h (14.6 vs. 10.3 and 14.5 vs. 10.5 mmol/L, respectively [$p < 0.001$ for both]) but not at 0700h and 1200h, despite prednisolone recipients receiving higher daily insulin doses (0.67–0.70 vs. 0.61–0.65 U/kg [$p = 0.001$]) due to higher doses of ultrarapid-acting insulin at 1200h and 1700h.

Comment: Corticosteroids can have a profound effect on blood glucose control in patients with diabetes. They are commonly used and can often cause significant hyperglycaemia in patients admitted to hospital. Many may be usually well controlled on oral agents, but require short-term insulin therapy to control glycaemia when on steroids. I have included this paper mainly because it highlights the issue rather than because I think it is a good study. I am surprised that the authors chose to use glargine as a basal insulin in this setting when it is well known that the profile of hyperglycaemia induced by prednisolone is more suited to NPH insulin. In fact the authors have previously published on this very fact. Therefore it is perhaps not surprising that this basal-bolus regimen was not terribly effective.

Reference: *Intern Med J* 2015;45(3):261–6
[Abstract](#)

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Research Review publications are intended for New Zealand health professionals.

Vaccines for the prevention of seasonal influenza in patients with diabetes

Authors: Remschmidt C et al.

Summary: This was a systematic review and meta-analysis of 11 observational studies (n=170,924) reporting on influenza vaccination in patients with types 1 and 2 diabetes. The vaccine effectiveness values for reducing all-cause and influenza/pneumonia hospitalisations among patients aged 18–64 years were 58% and 43%, respectively, but there was no significant effect on all-cause mortality or influenza-like illnesses in this age group. The respective vaccine effectiveness values in patients aged ≥65 years for all-cause mortality, all-cause hospitalisation, influenza/pneumonia hospitalisation and influenza-like illnesses were 38%, 23%, 45% and 13%. However, the quality of the evidence was low to very low for all outcomes, with residual confounding due to significant off-season estimates for several outcomes.

Comment: It is coming into the influenza season and therefore this paper caught my eye. As indicated, people with diabetes have higher rates of influenza, and on this basis most guidelines recommend annual vaccination for all those with diabetes. However, there is very little high-quality evidence that this is an appropriate strategy. This review found very few studies, all observational, examining this question. The authors concluded that there is not sufficient evidence to determine benefit of vaccination for people with diabetes. Given the cost of widespread annual vaccination programmes, surely a well-conducted randomised controlled trial should be done to answer this.

Reference: *BMC Med* 2015;13:53

[Abstract](#)

Independent commentary by Associate Professor Jeremy Krebs, an endocrinologist with a particular interest in obesity and diabetes. He is an Associate Professor with the University of Otago, and Director of the Clinical Research Diploma at Victoria University. As well as clinical and teaching activities, Assoc Prof Krebs maintains active research interests in the area of obesity and diabetes, with a focus on nutritional aspects, bariatric surgery and diabetes service delivery. **For full bio [CLICK HERE](#).**



Risk and recurrence of serious adverse outcomes in the first and second pregnancies of women with preexisting diabetes

Authors: Tennant PWG et al.

Summary: The absolute risks and recurrence of serious adverse pregnancy outcomes were reported for 440 successful singleton pregnancies in 220 women with pre-existing diabetes. Serious adverse outcomes occurred in 30.5% of first pregnancies, including a congenital anomaly rate of 6.4% and a foetal/neonatal mortality rate of 24.1%, and the respective rates for second pregnancies were 16.8%, 9.5% and 7.3%. The serious adverse outcome rate for second pregnancies was doubled among women who had experienced a previous adverse outcome than in those who had not (26.9% vs. 12.4% [p=0.004]), but there was no association between a previous adverse outcome and preparation for a subsequent pregnancy.

Comment: Women who have pre-existing diabetes, particularly if it is undiagnosed, have worse pregnancy outcomes than those with gestational diabetes or no diabetes. This paper looked at this group and also examined the outcomes of subsequent pregnancies. The observation that 30% of first pregnancies end in a serious adverse outcome is alarming. Although this was much lower in the second pregnancy, it suggests that there remains an opportunity to improve care. This study highlights the importance of prepregnancy counselling and attention to glycaemic control. In addition it shows the importance of taking the opportunity to intervene after the first pregnancy to improve outcomes of subsequent pregnancies.

Reference: *Diabetes Care* 2015;38(4):610–9

[Abstract](#)

Starting insulin in type 2 diabetes: real-world outcomes after the first 12 months of insulin therapy in a New Zealand cohort

Authors: Sehgal S & Khanolkar M

Summary: This was a retrospective review of the electronic clinical records of patients with type 2 diabetes who initiated intermediate-acting insulin isophane (n=273), insulin glargine (n=24) or premixed insulin (n=42) at an Auckland tertiary referral centre during 2012. Mean HbA_{1c} level at insulin initiation (89–95 mmol/mol) had decreased significantly by 16.6 mmol/mol with insulin isophane, 26.6 mmol/mol with insulin glargine and 23.4 mmol/mol with premixed insulin at 12 months (p<0.05 for all). Compared with insulin isophane, insulin glargine was associated with a significantly greater likelihood of achieving the HbA_{1c} target of <55 mmol/mol (16.7% vs. 4.8% [p=0.04]) and premixed insulin was associated with a significantly higher persistence rate (90.5% vs. 69.6% [p=0.01]).

Comment: The initiation of insulin therapy is a very important time in the pathway of a person with type 2 diabetes. It is often delayed by both patient and healthcare provider for a variety of reasons. Therefore when it is finally done, blood glucose levels are often quite high. There are many theories about which is the best insulin to initiate and many algorithms to help facilitate this, but there is very little quality evidence to support these. Furthermore, there is considerable pressure and influence from pharmaceutical companies promoting their specific products, which can confuse health professionals, particularly in primary care where a greater proportion of insulin initiation is now beginning to occur. This report of an NZ experience is interesting. It demonstrates that the predominant insulin being used in this centre is NPH. There were some differences in observed improvements in HbA_{1c} levels between insulins; however, this is a retrospective observational study. There are so many factors that will have influenced the choice of insulin that simply can't be adjusted for in such a study. Whilst interesting data, they cannot be used to inform policy on insulin choice. I firmly believe that this is a situation where careful individualisation of the regimen is critical. There is no one size fits all.

Reference: *Diabetes Ther* 2015;6(1):49–60

[Abstract](#)



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Management of diabetes by primary health care nurses in Auckland, New Zealand

Authors: Daly B et al.

Summary: These authors surveyed primary healthcare practice, district and specialist nurses in Auckland by postal self-administered questionnaire (n=284) and telephone interviews (n=287) during 2006–2008, and collected biographical and diabetes management data for 265/308 of their patients with diabetes seen on a randomly selected day. Nurses were able to access bodyweight data for 68% of their patients, body mass index data for 16%, either HbA_{1c} or serum glucose level data for 82% and information on whether patients undertook blood glucose level self-monitoring for 96%. Nurses' management activities focused on providing advice on diet (70%) and physical activity (66%), weighing patients (58%) and testing and discussing blood glucose levels (42% and 43%, respectively), although significant variation was seen among these figures according to nurse group (p<0.05), with the highest figures generally reported by specialist nurses and the lowest by district nurses.

Comment: Continuing a theme of NZ-based research this month, this paper looked at the activity of nurses in the management of diabetes in primary care in Auckland. The time when most people with diabetes were referred to and managed by specialist teams in secondary-care clinics has long gone. As the prevalence of type 2 diabetes has increased, the role of primary-care teams has assumed much greater importance. Utilisation of the large primary-care nursing resource to achieve this will be an ever-increasing reality over the next decade. For this to be effective, nurses need to be adequately skilled, have effective connections within their team and with specialist teams, and have appropriate and timely patient information. This study highlights areas where this can be improved. High-quality consistent resources and good IT systems for health data availability across services must be a priority.

Reference: *J Prim Health Care* 2015;7(1):42–9

[Abstract](#)

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