The Diabesity Crisis
Jim Mann, Rachael Taylor, Wayne Cutfield

Two recent events in March 2017 (‘The Diabesity Crisis’ Symposium and the ‘Cost of Sugar’ Forum) hosted in Auckland by the Edgar Diabetes & Obesity Research Centre (EDOR) and two National Science Challenges: Healthier Lives and A Better Start aimed to be more than just another ‘talkfest’ about the related epidemics of obesity and type 2 diabetes (T2DM) in New Zealand.

The organisers asked a group of international and national speakers with expertise in epidemiology, endocrinology, genetics, Māori health, nutrition, physical activity, public health and clinical medicine to summarise the current state of knowledge and new research in order to identify priorities for action.

Given the ever-increasing number of obese children and adults in New Zealand, many with T2DM, developing a rational approach to prevention and management is essential. An important first step is the acceptance that obesity, if untreated, is a chronic progressive disease associated with the early development of comorbidities and reduction of life expectancy. Rachel Batterham, Tony Merriman and Dave Grattan all emphasised the role of genes and the powerful biological mechanisms which can explain how overweight and obesity develop as a ‘normal’ response to the current ‘obesogenic’ environment. Increasing awareness that obesity, like other major chronic diseases, results from an interaction between biology and environment helps to shift the dialogue from a position of blame to one of solution and the development of a more rational approach to management.

What then should we offer to the obese patient? An important message to be taken from Rachel Batterham’s presentation is that powerful biological mechanisms also hamper maintenance of initial weight loss achieved by energy restriction. So, approaches which provide long-term support and encouragement are essential. These include targeting physical activity, sedentary behaviour, sleep and diet in a multitude of ways, including limiting exposure to the temptation of consuming energy-dense foods (eg, the dessert menu in a restaurant).

The extent to which such support systems can be implemented in primary care or in other community settings depends upon the availability of resources, but surprisingly they have rarely been tested. However, we do know that a straightforward nurse-led support programme can be as effective, and indeed much less costly, than more intensive weight management programmes involving specialist guidance for maintaining weight loss.1 Kirsten Coppell discussed the evidence base for the provision of dietary advice by primary care practitioners. Several models have been reported to achieve weight loss, but there is little information regarding long-term outcomes or cost effectiveness.2

Currently, available drug treatments have little or no place in the management of obesity, so unsurprisingly the role of bariatric surgery was an important feature of Rachel Batterham’s contribution to the Symposium. The most widely undertaken procedure, laparoscopic sleeve gastrectomy, has a very low rate of complications (similar to that of gall bladder surgery) and as is the case with gastric bypass surgery, which is often still undertaken in people with diabetes, is associated with substantial weight loss as well as an appreciable improvement in comorbidities, notably T2DM. Typically there is an immediate post-surgical improvement in blood glucose levels. Dosage of hypoglycaemic agents (oral hypoglycaemics and insulin) is invariably reduced and often may no longer be necessary.

Current criteria for surgery in New Zealand are more rigid than in most Western countries, and while surgery is not appropriate for all obese patients, the criteria certainly warrant an urgent review, especially as they apply to obese patients with T2DM. In the UK it is recommended that all patients with recent onset T2DM and a body mass index (BMI) greater than 35kg/m² be assessed for
the possibility of bariatric surgery after non-surgical measures have been tried without sustained weight loss. This might be a useful starting point for the discussion about extending the criteria for surgery in New Zealand.

Callie Corrigan discussed issues relating to bariatric surgery, which are particularly relevant to Māori. Individuals will have a much more successful experience of bariatric surgery if they are supported by their whānau, especially the key decision makers around kai. The challenge for health professionals is to provide information and support, not only to individuals but also to their whānau. Information needs to be provided in accessible formats, taking account of Māori whakapapa and utilising oral and visual forms of communication as well as written ones. And to enable patients to move in a positive direction, support needs to be provided from a safe, comfortable and neutral place (without negative labels) that respects and values people. This can sometimes be as simple as having seats that are the right size. The capacity of the Māori health sector must be increased in order to develop more equal partnerships.

While bariatric surgery offers hope for people who have been unable to lose weight by other means, a greater long-term hope lies in developing medical therapies which mimic the mechanisms by which bariatric surgery achieves weight loss, reversal or improvement of comorbidities, and facilitates the maintenance of weight loss. Professor Batterham especially emphasised the central role of gut hormones as mediators of the benefit of bariatric surgery and as novel targets for the development of obesity therapies.

Measures aimed at stemming the tide of the ‘diabesity’ epidemic are of equal importance to therapeutic approaches. Given the dramatic increases in obesity and T2DM over a remarkably short period of time, there can be little doubt that while biological mechanisms explain predisposition, environmental factors must account for the current alarming statistics. Furthermore, successful maintenance of weight loss also requires an environment which is conducive to healthy food choices and regular physical activity. Widespread availability, relatively low cost and largely unrestricted advertising all contribute to overconsumption of sugar-sweetened beverages (SSBs) and energy dense foods, which are considered to be major contributors to excessive energy intakes.

Louise Baur provided strong evidence that intensive early childhood interventions can reduce the risk of excessive weight gain, especially in socio-economically disadvantaged groups who have high rates of obesity and little access to such programmes. However, the benefits are not sustained if the intervention is not maintained in the longer term. These findings are hardly surprising given the pervasive nature of the obesogenic environment, clearly illustrated by Louise Signal using the photographic records of a group of New Zealand children wearing cameras, which continuously recorded the environment to which they were exposed during their waking hours.

While diet is often considered the cornerstone of obesity management, behaviours on the other side of the energy balance equation are just as important. Dave Lubans summarised the effectiveness of different approaches to increasing physical activity and reducing sedentary behavior, particularly in adolescents. The potential benefits of resistance training for reducing adiposity and enhancing insulin sensitivity and the appeal of high-intensity interval training for overweight, but often very strong adolescents should not be underestimated. Reducing the decline in physical activity which typically occurs in adolescence and developing more innovative approaches to delivering physical activity sessions are major challenges with this age-group.

Unlike other types of sedentary behaviour such as screen time, sleep is a sedentary activity that is clearly good for health. Rachael Taylor highlighted the consistency of the evidence investigating the relationship between sleep and obesity in children, indicating that short sleepers have a two-fold greater risk of obesity than long sleepers. Moreover, the effect seems to persist into adulthood, indicating the potential for long-term benefits. Confirmation of sleep intervention as an effective obesity prevention tool is now urgently required. Given the observation that many of the adverse health outcomes associated
with poor sleep are also more common in Māori and Pacific children, it is also feasible that sleep interventions hold promise for reducing inequities in health. Regardless of their impact on weight, the physical and mental health benefits arising from a good night's sleep are numerous. Other novel approaches to obesity prevention and management may lie within our gut. Rinki Murphy and Wayne Cutfield reviewed current evidence, largely from animal studies, suggesting that the gut microbiome may contribute to a wide range of disorders, including obesity and type 2 diabetes mellitus. Intervention from healthy donors increases diversity of the gut microbiome and has been shown to markedly improve insulin sensitivity in a pilot study of adults with type 2 diabetes mellitus. Professor Cutfield is currently undertaking a gut microbiome transfer study to treat severe adolescent obesity using a novel encapsulation method for gut microbiome transfer. Similarly, obesity and diabetes research is embracing the digital world; Lisa Te Morenga highlighted the opportunities offered by mHealth (mobile health) initiatives and emphasised the need to establish close relationships with those communities, which are the intended end-users of such programmes. Co-design of research projects and programmes by researchers and communities (or end-users) is essential.

In 2015, the New Zealand Government released a childhood obesity plan involving 22 initiatives aimed at risk reduction as well as managing childhood obesity. Speakers acknowledged these positive steps but Cliona Ni Mhurchu drew attention to several recommendations4–8 which are considered to be important components of public health approaches to reducing the risk of obesity internationally, are consistent features of comparable plans in other countries9–10 and are conspicuous by their absence in the New Zealand plan:

- An enforceable healthy school food policy
- A government-led code for advertising food to children
- A tax on sugar-sweetened beverages.

The New Zealand Health Promoting Schools (HPS) Initiative and the Heart Foundation’s Fuelled4Life programme supports school communities to be more proactive about their health and wellbeing but does not include an enforceable healthy school food policy. The current Code for advertising food and beverages to New Zealand children and young people is voluntary, and such industry-operated self-regulation rarely delivers benefit to public health.11 A tax on SSBs has been one of the most widely discussed obesity prevention measures internationally, and evidence is emerging from countries that have implemented such taxes that they are effective.12 Furthermore, revenue from a SSB tax could be used to support other health programmes.13

The issues relating to sugar were discussed in some detail at the ‘Cost of Sugar’ Forum chaired by Kim Hill. Jim Mann summarised the science relating to the adverse health consequences of free (or added) sugars: unequivocal evidence for the role of sugars as a cause of dental caries; convincing evidence that high intakes (especially of SSBs) contribute to excess weight gain in children and to overweight and obesity in adults and that restriction can reverse this; and accumulating evidence that fructose and fructose-containing sugars (sucrose and high fructose corn syrup) have particularly adverse effects in terms of increasing insulin resistance, T2DM, gout and fatty liver disease. The evidence relating to dental caries and body fatness was the major determinant of the World Health Organization's (WHO) Recommendation that “free sugars should contribute no more than 10% total calories and ideally less than 5%”. Tony Blakely argued strongly that there was now sufficient evidence to implement a tax on SSBs in New Zealand despite the reservations expressed by Jacqueline Rowarth relating to the consequences of a global reduction of sugar intake for sugar producing countries, especially developing countries with marginal economies.

Callie Corrigan, Alex Brown and others present in the audience reminded us all of the critical importance of involving the community, especially the Tangata Whenua and those in high-risk groups when developing approaches aimed at tackling the ‘diabesity’ epidemic. Not only is there an obligation to do so, but without such involvement any overall initiative is likely to be unsuccessful.
The New Zealand Childhood Obesity Plan (2015) and the updated guidelines for Management of Obesity in Childhood (2016) list a number of important initiatives. However, the ‘Diabesity Crisis’ Symposium and ‘Cost of Sugar’ Forum suggested a number of further recommendations for immediate action to help stem the tide of the obesity and diabetes epidemic:

1. A tax on sugar-sweetened beverages (SSBs)
2. A government-led code for food advertising
3. An enforceable healthy school food policy
4. Review of eligibility criteria for bariatric surgery
5. Clear recommendations regarding the role of sleep in obesity prevention.

Competing interests:
Nil.

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REFERENCES: