Management of Obesity - From Life Style Modification to Weight Reduction Surgery

Dr. WB CHAN
Clinical Director, Qualigenics Diabetes Centre

Obesity is a growing global epidemic affecting almost all parts of the world. The proportion of obesity has increased by around 50% in USA from the early 90s to the late 90s.1 In Hong Kong, around 40% of the population are either overweight or obese according to the WHO Asia-pacific criteria.2 The problem not only occurs in adults, but also in children and teenagers. The body mass index of students has increased by more than 3 units in average over the last 30-40 years.3 Furthermore, a significant proportion of children are either overweight or obese. Although genetic factors do contribute to obesity, the large increase in prevalence is most likely caused by environmental factors and behavioural factors.2 A rather high prevalence of unhealthy eating habit,4 with only a small proportion of subjects having the regular habit of exercise,5 and with the advance of technology, less physical activity being required in daily living and work; all these, in various degrees, contribute to the development of obesity in our population.

The development of obesity, especially severe obesity, has a major impact on health, both at the personal level, as well as the population level. Obesity contributes to the development of hypertension, diabetes and dyslipidaemia, which are collectively known as cardiovascular risk factors.9 These risk factors in turn lead to the development of cardiovascular diseases, namely myocardial infarction and stroke, hence causing increase in morbidity and mortality. Furthermore, a recent large scale case control study suggests that obesity, especially central obesity has an independent impact beyond the associated risk factors.7,8 Apart from cardiovascular diseases, obesity is also associated with the development of various malignancies, especially gastrointestinal malignancies, breast cancer and ovarian cancer.9 Obesity contributes to the development of sleep apnoea, osteoarthritis, and polycystic ovarian syndrome etc.10 These diseases together lead to a poorer quality of life, increased medical expenses and increased sick leaves in obese subjects.11-12 Because of its high prevalence and various impacts on general health, obesity in fact poses a major threat on public health.

Assessment of an obese subject will include the degree of obesity, obesity-related medical problems, important secondary causes, and life style of the subject. The degree of obesity can be assessed by body mass index which is derived from dividing body weight in kilogram by the square of the body height in metre. According to the WHO Asia-pacific criteria, a BMI of 18.5 to 23 is regarded as normal, 23-25 as overweight, 25 to 30 as grade I obesity and > 30 as grade II obesity.13 It should be noted that more stringent criteria have been adopted compared with the international criteria due to differences in body built and an increased tendency to accumulate visceral fat at a lower BMI14. Apart from the degree of obesity, the waist circumference also serves as another index for abdominal obesity, which is also associated with cardiovascular events.9 Obesity causes a large variety of medical problems as mentioned above. Therefore, the assessment of these problems will at least include plasma glucose, lipid profile and blood pressure. Further assessments of vascular diseases, joint problems, sleep apnoea, and polycystic ovarian syndrome (PCOS) will depend on clinical suspicion and should be individualised. The secondary causes of obesity include hypothyroidism, Cushings Syndrome, hypothalamic diseases and drugs including steroids, anti-depressants, anti-convulsants, etc. A detailed clinical history is important in this regard. The most important cause for the development of obesity is often an unhealthy life style and hence a detailed assessment of life style is very important. These will include diet history emphasising on portion size, diet content and frequency of dining out, frequency and duration of exercise, daily activities especially the need for physical activity. Dietetic input is often of large help in this regard.

Life style modification is the safest method for weight reduction. Clinical trials including Diabetes Prevention Programme, Diabetes Prevention Study and the recent LOOK AHEAD trial all showed the effectiveness of life style modification.15-17 An average of sustainable 4-5% weight reduction can be achieved in these programmes. Usually these programmes will include calorie restriction, increased vegetable and fruit intake, encouraged physical activity up to at least 30 min per day at 4 times per week.18 These programmes have been shown to reduce the risk of diabetes by approximately 60%, an improved lipid profile and blood pressure control.19-20 In fact, the LOOK AHEAD trial demonstrated an improvement of reaching goals in HbA1c, blood pressure, but not in LDL-C.15, 17 The success of these programmes will heavily rely on the compliance of the patients in the programme. It should be noted that all these programmes not only include
physician's consultation, but also extensive paramedical support including dietetic consultation, exercise programme etc. The usual clinic-based consultation by a physician in fact serves as the control group rather than the active treatment group. Therefore, the implementation of these programmes in reality remains a major challenge. Furthermore, short term weight reduction programmes have also demonstrated to reduce blood pressure and prevent the development of hypertension in pre-hypertensive subjects. Meta-analysis showed that weight reduction has a modest effect on the prevention and treatment of hypertension with systolic blood pressure and diastolic blood pressure reduction of around 1.05 mmHg and 0.92mmHg per kilogram weight loss respectively. In fact, the effects of weight reduction are least in the reduction of low density cholesterol. It has been estimated that for every kilogram reduction in body weight, the LDL-C can be reduced by 0.02 mmol/l only. Furthermore, whether the change in life style will eventually lead to the reduction in mortality and cardiovascular events has not yet been confirmed by clinical trials.

Since life style modification can usually bring about 5% weight reduction only, more severe degrees of obesity can hardly be normalised by life style modification alone, although they can still benefit from weight reduction programmes. Quite often, weight reduction drugs are necessary to bring about a larger degree of weight loss. Currently, there are only 2 properly assessed weight reduction drugs in the market, namely Orlistat and Sibutramine. Orlistat acts by inhibiting the intestinal lipase, hence reducing the fat absorption. Meta-analysis showed that it can induce a further 2.9 kg weight reduction compared with placebo. The main side effects are mainly gastrointestinal, namely oily faeces, oily spotting etc. Though fat soluble vitamin deficiency has been of concern initially, it is not sustained by later studies. Furthermore, apart from weight reduction, it can reduce LDL-C by 10% and has been shown to prevent diabetes in obese subjects. However, the main problem with Orlistat is patient’s compliance. One survey showed that as low as 6% of the patients taking Orlistat will continue with the treatment at one year, possibly partly due to its inconvenience. The other drug, Sibutramine, is a noradrenaline and 5-hydroxytryptamine reuptake inhibitor which acts by inhibiting the appetite and increasing the rate of metabolism. Meta-analysis showed that it can induce a weight reduction of ~ 4.2 kg, slightly better than Orlistat. The main side effects are mainly an increase in blood pressure, palpitation, constipation and central nervous side effects including insomnia, restlessness etc. It is contraindicated in patients with psychiatric illnesses and known cardiovascular diseases. Apart from weight reduction, Sibutramine can raise HDL-C and lower triglyceride. In clinical trials, Sibutramine combined with casual consultation can result in a weight reduction of 11% over 2 years and can be conveniently applied in the general practice settings. However, the rise in blood pressure is still worrying in the long run. A large clinical trial called SCOUT which studies the effects of Sibutramine on a few thousand patients with either vascular diseases or at high risk of vascular events are on the way and will probably cast light on the cardiovascular safety and effectiveness of Sibutramine once it is released.

Bariatric surgery has become more popular in the last decade because of both improved safety and its known effectiveness. Bariatric surgery can be broadly classified into restrictive surgery and bypass surgery, the details of which are beyond the scope of this discussion. The two most commonly performed operations are gastric banding and Roux-en-Y gastric bypass. Bariatric surgery in general can produce a reduction of 40-60% excessive body weight, much more marked compared with medical therapy. Surgical complication rate is generally less than 10% in the first month and surgery-related mortality is less than 5/1000. Diabetes resolves in the first year in approximately 70-80% of diabetic subjects, and the number of antihypertensive medications are markedly reduced. Its effect on diabetes is especially impressive as a significant proportion of subjects have marked improvements in glycaemic control soon after the bypass operation, well before the effects of weight reduction. This phenomenon will hopefully lead to a deeper understanding of the pathophysiology of Type 2 diabetes and hence more effective treatment. Furthermore, longitudinal studies showed a reduced mortality and incidence of cancer in severely obese subjects having undergone bariatric surgery. However, there are still no long term randomised controlled trials to confirm its efficacy. Furthermore, data on subjects with lesser degrees of obesity are less extensive. Since the Oriental population has different criteria for obesity, that how to apply the international criteria for bariatric surgery in our local population is still empirical and controversial. The Asia-Pacific Bariatric Surgery Group (APBSG) so far has recommended bariatric surgery in Asian patients with BMI >37, or >32 with diabetes or two other obesity-related co-morbidities. However, these criteria are bound to change in the foreseeable future as more research data become available. Since bariatric surgery is meant to be irreversible, one should discuss with the patient in detail about the pros and cons of surgery before embarking on surgical treatment.

Management of obesity will include not only weight reduction, but also a proper assessment and treatment of obesity-related problems. Life style modification is still the cornerstone of weight reduction. However, for patients who have failed life style modifications or more severe degrees of obesity, the choice of treatment including medical treatment and bariatric surgery should be individualised and jointly made with the patient.

References