

## Obesity

### The metabolic syndrome: Which definition and how useful anyway?



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The rising tide of obesity and diabetes, together with drug treatments targeting insulin resistance, has fostered increasing recognition of the metabolic syndrome (MS). While it is agreed that core components of the MS are high waist circumference, hyperglycaemia, hypertension and dyslipidaemia, various bodies have provided alternative definitions that identify somewhat different people! This disparity led to a consensus statement by the International Diabetes Federation (IDF; see right). This document provides an excellent comparison of the different definitions of the MS, and highlights key differences.

Additional problems are that the World Health Organization (1999) definition uses non-current definitions of hypertension and dyslipidaemia, specifies a problematic definition of central obesity (waist-hip ratio rather than waist circumference), and includes microalbuminuria. The National Cholesterol Education Programme – Third Adult Treatment Panel (NCEP ATP III) definition (Expert Panel on Detection, Evaluation, and Treatment of Cholesterol in Adults, 2001) uses a relatively high

waist circumference cut-off. The European Group for the Study of Insulin Resistance (Balkau et al, 1999) definition involves insulin assays, which are not available, nor standardised, in most of the world.

The new IDF definition is a sensible advance and includes vital ethnicity-specific definitions for central obesity. At the present time, the IDF definition might be the best definition for UK use. Still unresolved, however, is whether this adds anything to clinical practice, beyond the measurement and management of the individual MS ingredients. Most likely to change this would be the widespread adoption of waist circumference as a clinical measure (itself not without controversy).

However, until this happens, or a *strictly defined* MS is demonstrated to have some clear role, the MS will remain a tool for epidemiological research and its adoption in routine practice appears unwarranted.

Balkau B, Charles MA (1999) Comment on the provisional report from the WHO consultation. European Group for the Study of Insulin Resistance (EGIR). *Diabetic Medicine* **16**: 442–3

Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (2001) Executive Summary of the Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). *Journal of the American Medical Association* **285**: 2486–97

World Health Organization (WHO); 1999) *Definition, diagnosis and classification of diabetes mellitus and its complications*. WHO, Geneva

### DIABETIC MEDICINE



### New IDF metabolic syndrome definition

Readability	✓✓✓✓✓
Applicability to practice	✓✓
WOW! factor	✓✓✓

1 There remains a strong need for a simple diagnostic tool to identify those at heightened risk of cardiovascular disease (CVD) or type 2 diabetes in clinical practice.

2 The International Diabetes Federation (IDF) held an expert workshop in May 2004 to examine and improve the previous metabolic syndrome definitions. Participants from all continents were present, along with representatives from the World Health Organization and the National Cholesterol Education Program – Third Adult Treatment Panel (ATP III).

3 A consensus statement was written following detailed discussions at the workshop. The ATP III definition from 2001 was used as a starting point; however, the new guideline differs in that it requires evidence of central obesity for diagnosis of the metabolic syndrome. The rationale is that central obesity is closely correlated with insulin resistance (which is not easy to measure in practice).

4 In addition to central obesity, the new definition requires a person to have two of the following: raised triglyceride level, reduced HDL-cholesterol (or specific treatment for these lipid abnormalities), raised blood pressure (or treatment of previously diagnosed hypertension), or raised fasting plasma glucose (or previously diagnosed type 2 diabetes).

5 The definition also contains guidance on gender- and ethnic-group-specific waist circumference cut-off values.

6 The statement also includes recommendations on additional criteria that should be included when researching the metabolic syndrome.

Alberti KGMM, Zimmet P, Shaw J (2006) Metabolic syndrome – a new world-wide definition. A Consensus Statement from the International Diabetes Federation. *Diabetic Medicine* **23**: 469–80

### DIABETES CARE



### Chromium treatment in obese population with type 2 diabetes

Readability	✓✓✓
Applicability to practice	✓✓
WOW! factor	✓✓✓

1 Previous studies have shown a positive effect of chromium supplementation on insulin sensitivity. A beneficial effect on HbA<sub>1c</sub> levels in type 2 diabetes has also been reported.

2 This 6-month, randomised, double-blind, placebo-controlled trial aimed to investigate the effects of chromium

supplementation (500 or 1000 µg) on glycaemic control and factors associated with the metabolic syndrome in people (n=46) with type 2 diabetes with HbA<sub>1c</sub>>8% and insulin requirements of >50 units/day. All participants had BMI>25 kg/m<sup>2</sup>.

3 A similar reduction in HbA<sub>1c</sub> was observed in all three groups (approximately 0.4%). No statistically significant differences were found between groups in the various parameters measured.

4 The authors concluded that high-dose chromium supplementation was not proven to be effective in an obese Western population with type 2 diabetes.

Kleefstra N, Houweling ST, Jansman FGA et al (2006) Chromium treatment has no effect in patients with poorly controlled, insulin treated type 2 diabetes in an obese Western population. *Diabetes Care* **29**(3): 5211–6

## CLINICAL GASTROENTEROLOGY AND HEPATOLOGY

### Orlistat improves ALT in non-alcoholic fatty liver disease

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓

**1** Non-alcoholic fatty liver disease (NAFLD) has been described as a manifestation of the metabolic syndrome. Shortcomings with previous studies mean that it is not clear which medication is most suitable for NAFLD treatment.

**2** This study aimed to assess the use of the gastrointestinal lipase inhibitor orlistat in people with NAFLD.

**3** The 6-month trial randomised 52 people with NAFLD to receive either orlistat (120 mg, three times daily) or placebo. NAFLD in the participants was diagnosed with ultrasound (US), and in 40 people was confirmed by liver biopsy.

**4** All participants undertook the same behavioural weight-loss programme and were assessed each month by US. Liver enzyme levels and other parameters were also measured. At the end of the study, 22 participants out of 44 completers had a second biopsy.

**5** A statistically significant reversal of fatty liver (as assessed by US) was observed in the orlistat group but not the control group ( $P < 0.05$ ).

**6** While reductions in serum alanine transaminase (ALT) levels were observed in both groups ( $P < 0.05$ ), the orlistat-treated patients exhibited a greater decrease than the placebo patients (-48% versus -26.4%, respectively).

**7** The authors concluded that orlistat improves serum ALT and steatosis in people with NAFLD.

Zelber-Sagi S, Kessler A, Brazowsky E et al (2006) A double-blind randomized placebo-controlled trial of orlistat for the treatment of nonalcoholic fatty liver disease. *Clinical Gastroenterology and Hepatology* **4**: 639-44

## POSTGRADUATE MEDICAL JOURNAL

### 86% of people with type 2 diabetes are overweight or obese

Readability	✓✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓

**1** This study aimed to examine the prevalence of obesity and overweight in the diabetes clinic of a large UK hospital, and their association with cardiovascular risk factors.

**2** The hospital's electronic diabetes register (n=3637) was examined. Clinic data from 2002 revealed that whereas only around 16% of people with type 1 diabetes were obese, 52% with type 2 were obese. Altogether, 86% with type 2 diabetes were overweight or obese.

**3** The authors concluded that obesity is the rule in the hospital's diabetes population. Furthermore, a worse CV risk profile was associated with obesity in this group.

Daousi C, Casson IF, Gill GV et al (2006) Prevalence of obesity in type 2 diabetes in secondary care: association with cardiovascular risk factors. *Postgraduate Medical Journal* **82**: 280-4

## INTERNAL MEDICAL JOURNAL

### Obesity driving the financial burden of type 2 diabetes

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓✓

**1** This study determined the healthcare costs attributable to type 2 diabetes in Australia in 2000. It also extrapolated them to the year 2051.

**2** Healthcare costs were estimated from the Freemantle Diabetes Study, which incorporated 1294 people

with type 2 diabetes. Costs were then projected using population projections and prevalence figures for type 2 diabetes.

**3** In 2000, the total diabetes-attributable healthcare cost in Australia for people with type 2 diabetes aged 25 years or over was A\$636 million.

**4** Assuming that prevalence rates remain at their current levels, the authors estimated a 2.5-fold cost increase in 2051. If prevalence rates of type 2 diabetes increase further in the future, the increase in cost could be 3.7-fold.

Davis WA, Knuiman MW, Hendrie D, Davis TME (2006) The obesity-driven rising costs of type 2 diabetes in Australia: projections from the Freemantle Diabetes Study. *Internal Medical Journal* **26**: 155-61

## ANESTHESIOLOGY

### Obesity and diabetes predicts worse CABG outcome

Readability	✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

**1** The aim of this study was to investigate the influence of obesity in adverse post-operative outcomes after primary coronary artery bypass graft (CABG) surgery.

**2** Over 9850 people undergoing CABG surgery at the Texas Heart Institute were studied retrospectively. People with and without diabetes were classified into groups according to BMI.

**3** Obesity in people with diabetes, but not in people without diabetes, was independently associated with adverse post-operative outcomes (e.g. respiratory failure, ventricular tachycardia).

**4** However, obesity in those with diabetes was not associated with increased risk of mortality or sepsis.

Pan W, Hindler K, Vei-Vei L et al (2006) Obesity in diabetic patients undergoing coronary artery bypass graft surgery is associated with increased postoperative morbidity. *Anesthesiology* **104**: 441-7

**Obesity is the rule in the hospital diabetes population.**

**If prevalence rates of type 2 diabetes increase further in the future, in Australia the increase in cost could be 3.7-fold.**