

# The 1<sup>st</sup> International Congress

## on Prediabetes and

## the Metabolic Syndrome

☒ Pesach Segal and Paul Zimmet

*The enormous impact of the metabolic syndrome on public health, and the exciting progress made in research into this field recently, led to the organization of the '1st International Congress on Prediabetes and the Metabolic Syndrome' in Berlin, Germany in April 2005. The congress was dedicated to the recent advances in this field and served as a much-needed platform for the presentation and evaluation of concepts in the aetiology of the metabolic syndrome, and current screening and intervention efforts. Pesach Segal and Paul Zimmet report on the meeting, which brought together almost 2500 delegates – scientists, clinicians and industry – from 85 countries.*

that, when occurring together, may indicate a predisposition to diabetes, high blood pressure, and heart disease. Since the term Syndrome X was already used by cardiologists, 'metabolic syndrome' emerged as the most durable term for this condition.

**The metabolic syndrome is a cluster of factors such as central obesity, hypertension and IGT.**

The metabolic syndrome is defined as a cluster of factors, such as central (visceral) obesity, high blood pressure, insensitivity to insulin, blood-fat abnormalities and IGT. A consensus on a worldwide definition of the metabolic syndrome, reached by the Task Force on Epidemiology of the International Diabetes Federation (IDF), was presented for the first time during the congress in Berlin.

New definitions of waist circumference (measuring central abdominal obesity) for European men and women, and ethnicity-specific values for other groups – such as Asians – were agreed

The term 'prediabetes' was originally used by the World Health Organization (WHO) to describe, retrospectively, the state of a person before a diagnosis of diabetes. More recently, the term has been used in the USA to describe people with a high risk of developing diabetes in the future, including those with either **impaired glucose tolerance (IGT)** or **impaired fasting glucose**. Although it conveys a clear

message, the term can be misleading since it does not include some people who are at risk of developing diabetes: those with a family history of the condition, for example. Furthermore, only half of those with 'prediabetes' will actually develop diabetes.

In the late 1980's, the term 'Syndrome X' was used to describe a cluster of conditions – not including obesity –

upon. The IDF consensus also includes recommendations for future research into components that are not currently included in the core definition of the metabolic syndrome. It also highlights the aims of treatments for the metabolic syndrome and its components.

### Epidemiology

Several talks during the congress described the prevalence of the metabolic syndrome. Globally, there are approximately 314 million people with IGT and this is predicted to rise to 500 million by 2025. Declining levels of physical activity, increasing calorie intake, and subsequent rises in the rate of obesity are leading to increases in the number of people with IGT from most ethnic and cultural backgrounds.

Countries in the Middle East, particularly the Persian Gulf States, have a high prevalence of IGT, as do India and China. The congress heard that if current trends were to continue, over the next decade nearly 50%-60% of people with diabetes would come from Asia. In developed countries, the major increase in the number of people with diabetes will be in young or middle-aged people.

In addition, people with low socio-economic status and low levels of education have a two-to-three times greater risk of developing the metabolic syndrome; people who are educated to a higher level tend to be less likely to smoke, be obese, or have a sedentary lifestyle.

### The metabolic syndrome and CVD

The association between diabetes and cardiovascular disease (CVD)

has been previously reported. During the Berlin meeting, further evidence of this was presented. One of the presenters described a study which demonstrated that in people with diabetes, for every 1% rise in HbA<sub>1c</sub> (a measurement of long-term blood glucose levels), there was an 18% rise in the risk of cardiovascular events, such as a heart attack or stroke.

**People with the metabolic syndrome face at least a two-fold increase in the risk of CVD.**

Similarly, for every 1% rise in HbA<sub>1c</sub>, there is a 28% increase in peripheral arterial disease in people with diabetes. In addition, people who have suffered a cardiovascular event often have abnormal levels of blood glucose. The metabolic syndrome carries at least a two-fold increase in the risk of CVD and there is a poorer prognosis following

any coronary heart disease event in people with the metabolic syndrome.

In relation to the metabolic syndrome, low-density lipoprotein cholesterol (so-called 'bad' cholesterol) is prominent in a large number of people. This can be regarded as one of the major driving forces of CVD. Low blood levels of high-density lipoprotein cholesterol (the 'good' cholesterol) and high levels of **triglycerides** are also components of the metabolic syndrome and risk factors for CVD. The metabolic syndrome more strongly predicts congestive heart failure, CVD, and mortality than its individual components.

### Treatments

Several presentations described the treatment options for the metabolic syndrome. As current knowledge does not identify a single common mechanism for the syndrome, no single treatment agent is available. The individual components of the



From left to right: George Alberti, IDF; Guy Barnett, Senator Australian Parliament; and Paul Zimmet, IDI.

See page 11 for an explanation of the term **impaired glucose tolerance**.

**Impaired fasting glucose** is a condition in which a blood glucose test, taken after an eight- to 12-hour fast, shows a level of glucose higher than normal but not high enough for a diagnosis of diabetes.

See page 11 for an explanation of the term **triglycerides**.

metabolic syndrome such as central obesity, high blood fat, and high blood pressure should be treated separately. However, promise was shown by new pharmacological agents such as 'endocannabinoid receptor blockers' (for more on these possible new therapies, see *Diabetes Voice* 2005 special issue on smoking and diabetes).

One of the overwhelming themes of several presentations was the impact of lifestyle changes, such as diet and exercise, in preventing the development of type 2 diabetes. People with IGT, who are at high risk of developing diabetes, were encouraged to reduce their weight and their intake of total fat and saturated fat, increase their intake of dietary fibre, and do 30 minutes of physical activity per day. During a follow-up period of several years, there was a 58% reduction in the development of diabetes in the people who implemented these lifestyle changes compared to the people with IGT who did not change their lifestyle.

In other studies presented at the congress, glucose-lowering medications

were used to prevent diabetes in people with IGT. Drugs were found to be effective in preventing the development of diabetes, but not to the same extent as the intensive lifestyle modifications.

There are at present several ongoing studies, using different classes of medication, aiming to find out whether these drugs can prevent diabetes and its CVD complications, in people with the metabolic syndrome. Long-term follow-up will provide information on whether diabetes can actually be prevented, or its appearance is merely delayed by either lifestyle or drugs interventions.

### Summary

In summary, the '1<sup>st</sup> International Congress on Prediabetes and the Metabolic Syndrome' reported that better definition and intense study of the metabolic syndrome have led to some important insights over the past decade:

- the metabolic syndrome is extremely prevalent
- people with the metabolic syndrome are at high risk for diabetes and CVD
- intensive lifestyle changes are effective, and conditions should be created to encourage people to eat properly, engage in physical activity and thus avoid becoming obese
- effective pharmacological therapies must also be identified.

Following the success of this first meeting, the organizers announced the '2<sup>nd</sup> Congress on Prediabetes and the Metabolic Syndrome', to be held on 25-28 April 2007 in Barcelona, Spain. Further information can be found at: [www.kenes.com/prediabetes2007](http://www.kenes.com/prediabetes2007).

### ✉ Pesach Segal and Paul Zimmet

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Selected oral presentations from each day of the '1<sup>st</sup> Congress on Prediabetes and the Metabolic Syndrome', were summarized in highlights, which are available on the congress website at: [www.kenes.com/prediabetes](http://www.kenes.com/prediabetes).