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Preventing Diabetes: The Task of the Family Doctor

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A Growing Problem

The World Health Organization (WHO) estimates that the number of persons who have diabetes may double to 300 million by the year 2025, of which 90-95% will be type 2.¹ It is estimated that 76% of those diagnosed will be in developing countries and the Asia Pacific region will be at the forefront of that epidemic.² While those afflicted in developed countries will be mostly women and those over 65 years, those in developing countries will be in the 45-64 years age group, equally of both sexes. The WHO concludes that the world faces a global health problem of an epidemic nature, but we do have the knowledge to prevent many cases of diabetes mellitus and to reverse this epidemic that threatens young lives.

The great majority of the population that is at high risk of developing diabetes in five to 10 years' time will present with the Metabolic Syndrome, otherwise known as Insulin Resistance Syndrome, or Syndrome X.³ At this stage they are already at risk for macrovascular and microvascular complications. For this phenotype, the new diagnostic category of impaired fasting glucose, as a marker of increased risk (plasma glucose of >6.1 to <7.0 mmol/L) has been proposed by WHO and the American Diabetic Association.^{4,5} The US National Institute of Health has proposed criteria for the Metabolic Syndrome.⁶

A Changing Pattern of Disease

Type 2 diabetes is no longer regarded as a maturity onset disease, but is emerging

as a disease of young people.⁷⁻⁹ There are intriguing findings that, at the pre-diabetic stage, markers of inflammation may be present. These include leucocytosis and elevated erythrocyte sedimentation rate and C-reactive protein.^{10,11} At puberty, patients present with signs of insulin resistance.

More females are affected and the following characteristics should be noted: overweight, hirsute girls with oligomenorrhoea or amenorrhoea, and the early presentation of polycystic ovarian syndrome. Acanthosis nigricans (intertriginous hyperpigmentation) is a marker of insulin resistance.

Mobilising Lifestyle Factors

Many prospective studies have found that dietary change and physical activity can substantially reduce the risk of diabetes.¹⁰⁻¹³ A recent report from the Finnish Diabetes Prevention Study reported a reduction of diabetes by one-half of individuals with impaired glucose tolerance, through lifestyle interventions.¹²

While good blood sugar control should reduce microvascular complications, the reduction of macrovascular complications to prevent cardiovascular disease requires intensive efforts to stop smoking, reduce blood pressure and weight, increase physical activity and improve lipid profiles. Moderate weight loss and moderate exercise, incorporated into everyday life can improve cardiovascular health.¹⁴ The Dietary Approaches to Stop Hypertension (DASH Trial) diet, which has been shown to lower blood pressure, also lowers total cholesterol and low-density lipoprotein cholesterol and should reduce coronary heart disease.¹⁵ The diet increases intake of fruits, vegetables and low-fat dairy products and decreases intake of saturated fat, total fat and cholesterol.

What of Medication?

There is a place for drugs in the prevention of diabetes. Metformin (dimethylbiguanide), an old drug, acts by reducing insulin resistance, dampening hepatic gluconeogenesis and inducing weight loss, preferentially involving adipose tissue. There is a consequent lowering of levels of insulin required for glucose homeostasis. In a trial on American adolescents who were obese and

hyperinsulinemic, metformin reduced fasting glucose levels and bodyweight, without dietary restriction.¹⁶ The UK Prospective Diabetes Study Group reported, in their landmark study, that metformin had favorable effects on diabetes related endpoints, stroke and all mortality, in excess of what could be attributed to control of blood sugar.¹⁷ Several ongoing trials are examining the place of metformin in preventing diabetes. A new class of drugs, the thiazolidenediones represented by troglitazone and pioglitazones, also reduce insulin resistance, but their long term effects are not yet known. Their effect is principally on peripheral resistance in muscle and fat tissue and should complement the effect of metformin on hepatic insulin resistance.

Conclusion

We face a global epidemic of type 2 diabetes. There is a historic opportunity to demonstrate the effectiveness of family practice in preventing this major cause of disease and death.

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