

In Shortly About Diabetes

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According to the definition of World Health Organization, diabetes is a chronic, metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which leads over time to serious damage to the heart, blood vessels, eyes, kidneys, and nerves. The most common is type 2 diabetes, usually in adults, which occurs when the body becomes resistant to insulin or does not make enough insulin. In the past three decades, the prevalence of type 2 diabetes has risen dramatically in countries of all income levels. Type 1 diabetes, once known as juvenile diabetes or insulin-dependent diabetes, is a chronic condition in which the pancreas produces little or no insulin by itself. For people living with diabetes, access to affordable treatment, including insulin, is critical to their survival. There is a globally agreed target to halt the rise in diabetes and obesity by 2025.

This first WHO [1] Global report on diabetes underscores the enormous scale of the diabetes problem, and the potential to reverse current trends. The political basis for concerted action to address diabetes is there, woven into the Sustainable Development Goals, the United Nations Political Declaration on NCDs, and the WHO NCD Global Action Plan. Where built upon, these foundations will catalyse action by all.

Countries can take a series of actions, in line with the objectives of the WHO NCD Global Action Plan 2013–2020, to reduce the impact of diabetes:

- Establish national mechanisms such as high-level multisectoral commissions to ensure political commitment, resource allocation, effective leadership and advocacy for an integrated NCD (non-communicable disease) response, with specific attention to diabetes.
- Build the capacity of ministries of health to exercise a strategic leadership role, engaging stakeholders across sectors and society. Set national targets and indicators to foster accountability. Ensure that national policies and plans addressing diabetes are fully costed and then funded and implemented.
- Prioritize actions to prevent people becoming overweight and obese, beginning before birth and in early childhood. Implement policies and programmes to promote breastfeeding and the consumption of healthy foods and to discourage the consumption of unhealthy foods, such as sugary sodas. Create supportive built and social environments for physical activity. A combination of fiscal policies, legislation, changes to the environment and

raising awareness of health risks works best for promoting healthier diets and physical activity at the necessary scale.

- Strengthen the health system response to NCDs, including diabetes, particularly at primary-care level. Implement guidelines and protocols to improve diagnosis and management of diabetes in primary health care. Establish policies and programmes to ensure equitable access to essential technologies for diagnosis and management. Make essential medicines such as human insulin available and affordable to all who need them.
- Address key gaps in the diabetes knowledge base. Outcome evaluations of innovative programmes intended to change behaviour are a particular need.
- Strengthen national capacity to collect, analyse and use representative data on the burden and trends of diabetes and its key risk factors. Develop, maintain and strengthen a diabetes registry if feasible and sustainable.
- There are no simple solutions for addressing diabetes but coordinated, multicomponent intervention can make a significant difference. Everyone can play a role in reducing the impact of all forms of diabetes. Governments, health-care providers, people with diabetes, civil society, food producers and manufacturers and suppliers of medicines and technology are all stakeholders. Collectively, they can make a significant contribution to halt the rise in diabetes and improve the lives of those living with the disease.

As is the case for so many chronic diseases, the exact cause of diabetes is not known [2]. Type 1 diabetes, also known as insulin-dependent diabetes, usually starts in childhood; it is probably an autoimmune disease. This means that, for reasons we do not completely understand, the body turns on its immune system to destroy the pancreas's ability to produce insulin. The result is a lack or absence of insulin.

Type 2 diabetes, often referred to as non-insulin-dependent diabetes, or adult-onset diabetes mellitus, usually starts in adulthood after age 40. Although there is no single cause for Type 2 diabetes, its onset appears to be related to a series of factors. It is more common among people who are overweight, where the excess fat does not allow the body to use the insulin well. In other words, insulin is produced, but the body is resistant to it. Insulin resistance means that the body is not very effective in moving the glucose from the blood into the cells of the body. Therefore, the glucose builds up in the blood because the body cannot use it.

Diabetes and Peoples around the World

Diabetes mellitus (DM) is a metabolic disorder characterized by chronic hyperglycaemia due to defects in insulin secretion and/or insulin action [3]. Worldwide, 285 million people were diagnosed with diabetes in 2010, and this number is predicted to exceed 400 million by 2030.

DM is a biochemical diagnosis based on fasting and postprandial (2h) glucose levels during a 75 g OGTT. In 1997, the American Diabetes Association (ADA) proposed lowering the normal fasting plasma glucose level to <6.1 mmol/L and the threshold for diabetes to ≥ 7.0 mmol/L. They also recommended that fasting plasma glucose was the preferred diagnostic test (outside of pregnancy) in order to reduce the number of OGTTs needed. In 2010, the ADA and WHO introduced HbA1c ≥ 48 mmol/mol or 6.5% as a diagnostic criterion for DM. A diagnosis of diabetes is confirmed in any person with typical hyperglycaemic symptoms (e.g. polyuria, polydipsia, and weight loss), with a random or postprandial blood glucose ≥ 11.1

mmol/L or fasting plasma glucose ≥ 7 mmol/L. In asymptomatic patients or those with intercurrent illness, a second abnormal result is necessary to establish a definitive diagnosis of diabetes.

Middle-aged and elderly people have a strong genetic predisposition to type 2 diabetes [4]. The specific genes responsible have not been discovered. People with a family history of diabetes are more likely to develop the illness as they age. Elderly patients with peripheral insulin resistance and reduced glucose-induced insulin release are more likely to develop type 2 diabetes than those without.

Physiologic and environmental factors compound genetic predisposition. Lower testosterone levels in men and higher testosterone levels in women are risk factors for diabetes development. Elderly individuals who have a high intake of fat and sugar and a low intake of complex carbohydrates are more likely to develop diabetes. Physical inactivity and central fat distribution predispose to diabetes in the elderly. Unlike younger patients, fasting hepatic glucose production is normal in elderly patients with type 2 diabetes and they have specific alterations in carbohydrate metabolism. The primary metabolic defect in lean elderly subjects is an impairment in glucose-induced insulin release, whereas the primary abnormality in obese elderly subjects is resistance to insulin-mediated glucose disposal.

Thirst, tiredness, pruritus vulvae or balanitis, polyuria, and weight loss are the familiar symptoms of diabetes [5]. Why then is the diagnosis so often missed? Of 15 new patients with diabetes presenting in our diabetic ward for the first time with ketoacidosis, 14 had no tests for diabetes after a total of 41 visits to their doctors. Almost all these serious cases of ketoacidosis could have been prevented.

Patients do not, of course, always describe their symptoms in the clearest possible terms, or else their complaints may occur only as an indirect consequence of the more common features. Many patients describe dry mouth rather than thirst, and patients have been investigated for dysphagia when dehydration was the cause. Polyuria is often treated blindly with antibiotics; it may cause enuresis in young people and incontinence in elderly people and the true diagnosis is often overlooked. Complex urological investigations and even circumcision are sometimes performed before diabetes is considered.

Early detection of disease may greatly simplify management [6]. When a patient registers with a new GMP (general medical practitioner), routine examination is performed and blood pressure (BP) is measured. If nothing else, the BP reading will form a baseline record for the future. The urine should also be tested for protein and sugar. The test is very simple to do but the early diagnosis of diabetes mellitus, detected by the presence of sugar in the urine, is most valuable. Routine health checks are done at various ages when the early diagnosis of high blood pressure is specifically sought.

Diabetes in young patients is usually due to a deficient supply of insulin [7]. This can also occur in old age but, more commonly, the insulin levels in elderly patients are high. It is the peripheral resistance and ineffective utilisation of the insulin that allows the blood glucose (sugar) level to rise in these older patients.

To have a persistently high blood sugar is undesirable, as it causes damage, especially to blood vessels. It is through the mechanism of circulatory change that diabetes mellitus causes problems. Vulnerable areas are the eye (diabetes is the commonest cause of blindness in the UK), the nervous system, the heart, the brain and the kidneys. The resulting problems are strokes, heart attacks, heart failure and kidney failure. The reduction in blood flow to the extremities is the reason why diabetes is the most common underlying problem in patients in the UK requiring amputations. In general, diabetic patients experience worse health than non-diabetics. They are more prone to infection as well as vascular disease. It has been suggested that diabetes mellitus, especially if poorly controlled, advances ageing by about 10 years. There is now good evidence that good diabetic control reduces the incidences of complications and morbidity.

As part of structured education, people with diabetes need to understand the condition [8]. Health professionals need to help them gain the educational tools they need to look after themselves. After all, who provides the majority of patient care? Those with diabetes themselves. They may see a health professional for a total of only a few minutes to a few hours in a year; therefore, it is important to engage them in the learning process.

Advising and working with people newly diagnosed with diabetes needs to be undertaken with understanding and in a sensitive manner, taking account of their level of understanding, culture and beliefs. They need to be encouraged to share their anxieties and express concerns for their future.

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