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VIEWPOINT

Are we really active in the prevention of obesity and type 2 diabetes at the community level?

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Abstract The prevalence of type 2 diabetes is increasing rapidly worldwide. Much of this increase in type 2 diabetes epidemic is related to the increase in obesity. There is now firm evidence from randomised trials that type 2 diabetes is preventable by lifestyle modification influencing diet, physical activity and obesity. This prevention effect is sustainable for many years after cessation of active intervention. The slow progression in the development and implementation of population-based strategies in the prevention of obesity and its most common and serious co-morbidity, type 2 diabetes, is of great concern. We summarise published implementation programmes and describe briefly the activities carried out in Finland. In the Finnish implementation programme for the prevention of type 2 diabetes (FIN-D2D), it was found that it is possible to prevent type 2 diabetes "in real life" in the primary health-care settings. We point out that innovative strategic guidelines and their proper implementation are needed to prevent the diabetes epidemic. Among the different tools, also taxation and other regulation to promote healthy food selection and good interaction with the media should be considered.

Along with increasing prevalence of obesity and a sedentary lifestyle, type 2 diabetes has become one of the leading chronic diseases in the world. However, perhaps a great surprise for many has been that its prevalence and incidence rates are much higher than predicted some 20 years ago. It was stipulated that the number of individuals with type 2 diabetes may exceed 100 million in the world by the year 2000 [1]. The numbers are dramatically higher; in 2010, it was estimated that there are 285 million people with diabetes, and now it is expected that 439 million

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people will have diabetes by 2030 [2]; and experts believe that this is a gross underestimate. In particular, the prevalence of type 2 diabetes is increasing very rapidly in China and India due to increasing sedentary lifestyle and overweight [3,4]. Such an epidemic of type 2 diabetes seems to occur already in all low- and middle-income countries around the world [5], but the prevalence of type 2 diabetes is also increasing in most affluent societies of North America and Europe [2].

Much of this type 2 diabetes epidemic is related to the increase in obesity [6]. Obesity is not a new phenomenon in the human society, but its prevalence started to increase in most societies along with the reduced need for physical activity to survive or have an adequate living. In Western societies, increasing trends have been usually seen since the mid-1970s. This has been associated with increasing mechanical transportation and television viewing [6]. This was topped by the food/beverage industry's launch of energy-dense 'fast foods', soft drinks and increasing consumption of alcoholic drinks in many countries. Thus, in the modern society, most persons are no longer in the need to find sufficient amount of food but merely need to control the amount they are consuming. While we have firm scientific evidence that type 2 diabetes is preventable by lifestyle modification [7—16], we want to draw attention to and also express our concern regarding the slow progression in the development of population-based strategies in the prevention of obesity and its most common and serious co-morbidity, type 2 diabetes.

The idea of primary prevention of type 2 diabetes is not a new one. The first article entitled 'The prevention of diabetes mellitus' in a medical journal was published already in 1921. The World Health Organization (WHO) published a report on the Prevention of Diabetes Mellitus in 1994 [1], but the 42nd World Health Assembly in May 1989 did already draw attention to the prevention of diabetes inviting member states in its resolution (WHA42.36) to the following activities:

(1) To assess the national importance of diabetes;
(2) To implement population-based measures, appropriate to the local situation, to prevent and control diabetes;
(3) To share with other member states opportunities for training and further education in the clinical and public health aspects of diabetes; and
(4) To establish a model for the integrated approach to the prevention and control of diabetes at community level.

From that time, many activities have been evoked, but most of them have been small-scale research activities, insufficient to address the major health burden caused by type 2 diabetes. Furthermore, still today no serious strategy exists to address the need to prevent the rapidly rising population of people with diabetes in the coming years. Besides the enormous health burden caused by diabetes and its long-term complications, in particular cardiovascular, to an individual and society, the rapidly increasing costs of the treatment of diabetes and its complications are becoming a true challenge to health-care providers, too [17—20].

In the spirit of the 42nd World Health Assembly and the WHO's early activity [1], a new world congress on the prevention of diabetes was organised for the first time in Copenhagen in 1996. This was followed by a regular series of meetings entitled the World Congress on Prevention of Diabetes and its Complications (WCPD), the 6th congress being held in Dresden in April 2010. Despite the great enthusiasm and positive atmosphere around these congresses and the commitments of the host nations and cities as well as the International Diabetes Federation (IDF) to promote the prevention of diabetes, the main message from these prevention congresses needs to be evaluated in terms of what is actually happening in the real world. The paradigm shift towards prevention of obesity and diabetes is absolutely mandatory if we really understand the huge challenge associated with the already existing epidemic of obesity and type 2 diabetes we are facing. In this brief article, we aim to summarise current nationwide activities going on and encourage health professionals to develop national programmes for the prevention of diabetes. We also want to raise the prevention of this disease to one of the major health policy issues, to which it in fact should have been assigned a long time ago.

Epidemiology of type 2 diabetes

The diagnosis of type 2 diabetes is based on elevated fasting and/or post-load glucose values in blood circulation. In the late 1990s, the cut-off value of fasting plasma glucose was agreed to be lowered to 7.0 mmol l^{-1}, which *per se* resulted in a higher prevalence of type 2 diabetes. Besides type 2 diabetes, two other categories of impaired glucose metabolism have been created: impaired fasting glucose (IFG) and impaired glucose tolerance (IGT) [21]. Elevated glucose values both acutely at the postprandial stage and in long-term are toxic to virtually all tissues in the body, and thus lead to chronic complications, of which microvascular and macrovascular diseases are most frequent. Atherosclerotic cardiovascular disease (ASVD), including coronary heart disease, cerebrovascular disease and peripheral vascular disease, are the most common complications or co-morbidities of type 2 diabetes, and also result in the main cause of death among 70—80% of patients with diabetes. It is important to note that the risk of ASVD increases already with slightly elevated glucose values [22,23]. Among different diabetic populations, cardiovascular morbidity and mortality is 2—4-fold as compared with the respective non-diabetic populations [2]. Furthermore, obesity *per se* has been recognised as a major cause of death through its effect on the risk of many chronic disease, for example, ASVD and cancers [24].

The prevalence of obesity and type 2 diabetes has been increasing during the last 30 years worldwide. The increase has been very rapid, and there has been no way to tackle it. The epidemic of type 2 diabetes is global. The prevalence of type 2 diabetes is increasing in all continents, in many economically developing countries, in newly industrialised nations and in most high-income countries. However, it will be a particular concern in rapidly developing countries, such as China and India. Furthermore, a major concern is related to the fact that type 2 diabetes is becoming increasingly common among young adults and even children. In many countries, the current prevalence of diabetes among adults