Young people with diabetes and obesity in Asia: a growing epidemic

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For some time now, international agencies have been warning about the rapid increases in the rates of diabetes and other chronic disease in Asian countries. Asia already accounts for a sizeable proportion of the world’s population with diabetes and the prevalence of diabetes in the region looks set to rise dramatically in the coming years. In addition, the age of onset of type 2 diabetes is moving downward. While the condition was historically diagnosed in people over age 65 years, nowadays type 2 diabetes in young adults is not unusual. Alarmingly, type 2 diabetes is now being diagnosed more frequently in adolescents and even young children. Tim Gill reports on this growing epidemic in Asia.

The International Diabetes Federation estimates the number of people with diabetes worldwide will reach 380 million by 2025. Over half of these will be living in Asia, provoking an enormous health burden in the region. Specifically, the growing epidemic is being driven by the dramatic rise in the number of people with type 2 diabetes. Until recently, type 1 diabetes was the only form of the condition considered prevalent among children. But the picture has changed.

Recent reports from China, Japan, and the Pacific Islands indicate that more than 70% of children diagnosed with the condition have type 2 diabetes. The early onset of type 2 diabetes is of enormous concern: disabling and expensive complications may begin to appear in these children early in adult life.

The rise in the number of children diagnosed with type 2 diabetes has attracted a great deal of attention. However, it is difficult to develop accurate estimates of the dimensions of the problem worldwide. Very few large-scale surveys of diabetes have been conducted in children and adolescents; most of the reports have relied on case data from paediatric clinics. In addition, many children may not have been detected and others misdiagnosed as having other forms of diabetes.

However, it is clear that this problem is not restricted to the developed countries of North America and Europe; it is already a major cause for concern throughout the Asian region. In fact, Asian children may be more susceptible to developing type 2 diabetes than their Caucasian peers. A study in the UK showed that children of South Asian
descent had a risk of developing type 2 diabetes that was 14 times greater than that of Caucasian UK children.\(^3\)

A recent assessment of data from 10 Asian countries suggested that type 2 diabetes accounts for around 10% of all childhood diabetes in the region. However, there was significant variation: up to 80% of all new cases of the condition in Japan were children with type 2 diabetes. Data from many Asian countries suggest that while the diagnosis of type 2 diabetes in children has occurred only recently, its incidence is now increasing at an alarming rate.\(^4\)

A study in Thailand reported that in 1997, 5% of children referred to a diabetes clinic had type 2 diabetes; by 1999 that figure had risen to 17%. Similar results have been found in clinics in India, Bangladesh and China.

One of the few population-based studies into rates of type 2 diabetes among children was undertaken in Japan, where 7 million schoolchildren underwent urine glucose screening with follow-up blood testing between 1976 and 1997. Over that period, the annual incidence of type 2 diabetes rose from 0.2 to 7.3 per 100 000 children per year, with larger rates of increase in the youngest (Figure 1).\(^5\) A screening programme involving around 3 million children in Taiwan has shown similar annual incidence rates of 4 and 7 per 100 000 boys and girls.

**Economic transition and rising obesity**

Rapid changes in the diet, levels of physical activity and body weight of children in Asian populations have been identified as the principal drivers of this emerging epidemic.\(^5\) There has been much discussion regarding how best to define and measure overweight in childhood. However, regardless of the method applied, childhood overweight and obesity is already a major health issue in Asia; its rise preceded and progressed in parallel with the development of childhood type 2 diabetes.\(^2\)

Although undernourishment remains a serious problem throughout Asia, more than one in 10 children in many countries in the region is already overweight. Surveys in Taiwan, for example, indicate that around one in four children has a weight problem.

Generally, rates of childhood obesity were higher in urban areas than in rural areas, and highest in countries with greatest economic development, such as Japan, Malaysia, and the Republic of Korea. Indeed, even countries like Indonesia that are just beginning the process of economic transition have not escaped this problem. A study of pre-school children from high-income families in Jakarta found that around 16% of children were obese.\(^6\)

**Rapid increase**

The rate of increase in levels of childhood overweight in Asia has been rapid. In Thailand during the 1990s, the prevalence of obesity in 6- to 12-year-old children rose from 12% to 16% in just two years. In China, surveys carried out during four different periods between 1989 and 1997 in children aged between 2 and 6 years revealed very large increases – particularly in urban areas, where the prevalence of overweight increased from 15% to 29%\(^7\).

**Sweeping changes**

The economic transition in Asia in recent years has provoked sweeping changes in lifestyle which have un-
doubtedly contributed to the increase in body weights in the region and the rise of type 2 diabetes. Modernization and open trade markets have resulted in profound changes to diets and levels of physical activity. Families throughout Asia generally consume more fats, particularly animal fats, more meat, more sugar, and less fresh vegetables and cereals than in the past. Motorized transport has replaced bicycles, and television, computers and DVDs are becoming the preferred leisure-time activities throughout the region – at the expense of more physically demanding pursuits. These changes not only contribute to rising rates of obesity, but also have the potential to directly influence the development of insensitivity to insulin and type 2 diabetes, independent of weight.

**Genetic factors**

Many researchers have looked into the disproportionate susceptibility of Asian populations to the development of weight-related health problems, and the possible existence of factors that place Asian children at increased risk of developing type 2 diabetes early in life. There are a number of known genetic factors that influence the heritability of type 2 diabetes. However, it is clear that these alone do not explain the large variations in risk between ethnic groups.

Some studies have shown that, compared with children of Europid origin, Asian children have higher levels of body fat at lower levels of body weight, and that this additional fat is associated with increased insensitivity to insulin. In addition, Asian children appear to deposit more fat centrally as they gain weight, which could also explain why increases in weight in these populations lead to higher levels of type 2 diabetes.

**Early years**

Another possible explanation is the finding that babies who were born small as a result of being undernourished in-utero, and who gained excessive weight during childhood, had an increased risk of developing chronic diseases early in life. The rapid economic transition in Asia has given rise to higher family incomes and the wider availability of high-fat, high-sugar processed foods. As a result, increasing numbers of undernourished children, born to impoverished parents, are fed excessive calories during childhood.

**Urgent action**

Whatever the reasons, Asian children are becoming more overweight and developing type 2 diabetes earlier in life. Urgent action is required to address the prevention of excessive weight gain and encourage the adoption of appropriate healthful behaviours in terms of diet and physical activity in all children throughout the region. Unless this issue is addressed quickly, rising levels of diabetes and associated illnesses will overwhelm the fragile healthcare systems of less-developed countries, and result in an enormous health, social and economic burden to the region.