

## DIABETES

# Risk of T2DM in children — influence of sleep duration

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In adults, short sleep duration is known to be associated with an increased risk of type 2 diabetes mellitus (T2DM), but whether this association is also present in children is unclear. A new study published in *Pediatrics* has begun to answer this question.

The study included 4,525 children from 200 primary schools in the United Kingdom (London, Birmingham and Leicester). The children were aged 9–10 years and were from a range of ethnic (black African–Caribbean, Asian and white European) and socioeconomic backgrounds. The children were asked to report their usual times for going to bed and getting up on a school

day, which enabled the researchers to calculate sleep duration. Furthermore, 1,766 of the children wore an accelerometer during waking hours for 7 days. The researchers used these data to compare activity levels with reported sleep duration and to confirm that the reported sleep levels were accurate.

In addition, blood samples were taken to determine serum levels of lipids and insulin, plasma levels of glucose and whole blood levels of HbA<sub>1c</sub>. The height and weight of the participants were measured to enable calculation of BMI, and fat mass was determined using bioelectrical impedance. Skinfold thickness measurements were also taken as a marker of subcutaneous adiposity.

The children reported sleeping for an average of 10.5 h a night; five categories of sleep duration were used to analyse the results (<9, 9.0–9.9, 10.0–10.9, 11.0–11.9 and ≥12 h). Compared with children who had a short sleep duration, those who slept for longer had lower body weight, markers of adiposity, insulin resistance and levels of insulin and glucose. “This study showed a novel graded (or straight line) association between short sleep duration and elevated risk markers for T2DM in these children,” observes author Christopher Owen (University of London, UK). “We also confirmed the association between short sleep duration and higher levels of body fatness.”

Interestingly, for every hour of extra sleep, insulin levels were nearly 3% lower, with a similar association seen for insulin resist-

ance and glucose levels, and there was no evidence for a graded association between sleep duration and HbA<sub>1c</sub>, lipid levels or blood pressure. In adjusted models, a 1 h increase in sleep was associated with a 0.19 kg/m<sup>2</sup> lower BMI, 0.03 kg/m<sup>5</sup> lower fat mass index, 2.9% lower HOMA index and 0.24% lower fasting levels of glucose.

Despite differences in sleep duration in children of different ethnic backgrounds (white European children slept the longest and black African–Caribbean children had the shortest sleep duration), the association between sleep duration and risk markers for T2DM was consistent across the ethnic groups. Socioeconomic status also had no effect on the association.

“These findings suggest increasing sleep duration could offer a simple, cost-effective approach to reducing levels of body fat and T2DM risk from early life,” concludes Owen. “However, to take this work forward we hope to obtain evidence from trials to confirm these findings.” These trials should enable the researchers to establish causality, and could lead to evidence-based recommendations for sleep duration in children. Given that insulin resistance during childhood can have a long-term effect on T2DM risk, limiting insulin resistance at this early stage could reduce the risk of T2DM in later life.

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