

# **Adverse consequences of sleep deprivation in Hong Kong adolescents – cardiovascular perspective**

Albert M. Li, Professor, Department of Paediatrics, Prince of Wales Hospital, The Chinese University of Hong Kong, Shatin, Hong Kong

## **Abstract:**

Sleep deprivation is a world-wide phenomenon and the issue is even more concerning for adolescents. Biological changes during adolescence lead to a shift in circadian phase preference from “morning” to “evening” type. The accumulation of sleep drive during daytime is slower relative to younger children, thus adolescents can easily cope with late bedtime. In addition, environmental and lifestyle/social demands such as extracurricular activities and home-work are other important culprits in pushing back sleep time. However, the sleep needs of adolescents do not reduce significantly and therefore a great proportion of them are chronically sleep deprived. In Hong Kong, a significant number of adolescents report to be sleeping for <6.5 hours during school term time, where the recommended sleep duration is 9 hours. Adolescents are well known to sleep compensate during school holidays. A difference of up to 2-3 hours in sleep duration between school term and holiday is often reported.

Chronic sleep deprivation is associated with a number of significant short and long term consequences. Adverse health outcomes that include sleepy driving-related crashes, obesity and metabolic dysfunction have been demonstrated in sleep-deprived adolescents. Impaired mood and behavioural control, neurocognitive deficits, suboptimal academic performance, increased tardiness and absenteeism have also been documented. Sleep duration impacts on blood pressure (BP) and acts as a risk factor for hypertension. Results from cross-sectional studies on adolescents have shown negative relationships between sleep duration and BP. Short sleep duration in adolescents can lead to prehypertension, increased systolic and 24-hr BP.

Maintaining healthy cardiac status in childhood and adolescence is vitally important. Childhood BP tracks into adulthood and the tracking coefficient is greater for adolescents. Forty percent of adolescents with hypertension have already developed left ventricular hypertrophy at the time of diagnosis. One of the risk factors to account for early deaths and coronary heart disease amongst young adults is elevated BP and hypertension in childhood and adolescence. Thus it is essential to tackle any BP abnormality in childhood and adolescence promptly in order to minimize future adverse cardiovascular events.

In children and adolescents, delaying school start time is a mean to increase sleep duration. Significant improvements are seen in markers of health and academic success in association with later school start times. However, delaying school start time in our locality has met with strong resistance from teachers who have to re-schedule the “lost time” into an already packed timetable, parents as any alteration to the school schedule may jeopardise their children’s after school extra-curricular activities and private academic tuition, and school bus companies as any delay implies a change to their busy schedules and that may affect their overall revenue.

In this talk, the presenter will review the latest literature linking sleep deprivation and cardiovascular adverse outcomes in the paediatric population and will share with the audience his on-going study that takes advantage of changes in sleep duration that occur during school holidays in adolescents to assess whether prolonging adolescents’ sleep would lead to a reduction in their BP.