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LETTERS TO THE EDITOR

Inflammation, Sleep and ADHD

Response to Araz Altay. Sleep disorders and attention deficit: a consequence of proinflammatory state? *J Clin Sleep Med.* 2018;14(6):1081.

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We thank Dr. Araz Altay for raising the important issue of inflammation, sleep and ADHD[1] and the editors of the *Journal of Clinical Sleep Medicine* for giving us the opportunity to respond.

Our group previously investigated adult ADHD symptoms, Metabolic Syndrome (MetSyn) and obesity-related variables in a large population study with different stages of comorbid affective disorders (Netherlands Study of Depression and Anxiety, NESDA).[2] Interestingly, we showed few clear associations: ADHD was not associated with MetSyn. It is possible that these associations are difficult to detect and therefore we failed to find them. Also, both the concept and definition of MetSyn have been questioned[3] as it is possible that not *all* MetSyn risk factors contribute significantly to cardiovascular diseases/diabetes in the general population.[4]

Concerning *obesity*, a meta-analysis showed that it was significantly associated with ADHD.[5] Both obesity and MetSyn are considered proinflammatory conditions.[6]

Another possible link includes *sleep disturbance*, which was associated with systemic inflammation markers in the NESDA cohort.[7] ADHD is comorbid with insomnia, RLS and circadian dysregulation.[8] Preliminary evidence links ADHD to inflammatory processes.[9] The circadian system and clock genes control both the sleep-wake cycle and metabolism.[10] Fasting glucose, lipid levels, blood pressure and the sleep-wake cycle are rhythmically coordinated by the biological clock. Disruption of either the circadian or metabolic system can lead to derangement of the other, predisposing to MetSyn, obesity or diabetes.[10] Once again, inflammatory processes may be the link between ADHD, circadian rhythm and metabolic disturbance. We therefore support further investigation of these overlapping processes, as causality is unknown.

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DISCLOSURE STATEMENT

Dr. Wynchank has served on the advisory boards of Janssen BV, Novartis and Eli Lilly for activities outside the scope of this letter (2009–2014). The authors report no conflicts of interest.