

SLEEP

Recreational MDMA users at risk of sleep apnea

Users of MDMA, or 'ecstasy', are more likely to experience sleep apneas (pauses in breathing) and hypopneas (overly shallow or slow breathing) than are nonusers, a new study has found. The results implicate brain 5-hydroxytryptamine (5-HT) in these types of sleep disordered breathing (SDB), and may help to illuminate the neurobiological underpinnings of SDB.

MDMA is a popular recreational drug that is also a potent 5-HT neurotoxin. Several lines of evidence indicate that it causes lasting damage to 5-HT neurons in the brain. MDMA users are known to have cognitive deficits and disturbed sleep, but the long-term consequences of using MDMA are not fully understood.

Obstructive sleep apnea (OSA) is a common sleep disorder characterized by episodes of apnea and hypopnea during sleep. Its underlying pathophysiology is poorly understood, although 5-HT neurons have been implicated owing to their involvement in normal sleep and breathing regulation. Una McCann

and her team collaborated with sleep apnea expert Alan Schwartz to determine whether 5-HT neuronal damage caused by MDMA puts users at risk of OSA.

The study included young, healthy recreational MDMA users, who agreed to abstain from drug use for 2 weeks before commencement, although most had abstained for months. These individuals were matched with a control group who had never used the drug. All participants were monitored by overnight polysomnography over a 5 day period in a sleep clinic.

McCann *et al.* found that the abstinent MDMA users "had greater number and rates of apneas and hypopneas" and were more likely to meet the criteria for OSA than were the controls. Furthermore, greater lifetime use of MDMA was associated with increased rates of sleep apnea, indicating a direct relationship with the extent of drug use.

On this evidence, recreational MDMA users should be considered to be an at-risk group for OSA. Una McCann comments

that the risk for these users "is greater than the risk associated with obesity, a well-known risk factor for sleep apnea." These findings also indicate a role for brain 5-HT systems in the pathophysiology of OSA.

Further investigation of the relationship between brain 5-HT, MDMA and OSA may help to determine the mechanisms by which MDMA-induced damage of 5-HT neurons leads to SDB. The authors speculate that "apneas and hypopneas, by disrupting sleep, may contribute to cognitive deficits found in MDMA users." Therefore, MDMA-mediated 5-HT neuronal damage may be both directly and indirectly responsible for the consequences of drug use.

McCann says that she and her team "will be working with Dr Schwartz to further understand the mechanism of sleep apnea in MDMA users."

Eleanor Beal

Original article McCann, U. D. *et al.* Sleep apnea in young abstinent recreational MDMA ("ecstasy") consumers. *Neurology* 8, 2011–2017 (2009)