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Letter to the Editor

Psychoactive drug influences on hair cortisol



Stalder et al. (2017) recently published a meta-analysis of the ‘stress related and basic determinants of hair cortisol in humans’. They investigated a range of factors, and the influence of co-variables such as age, sex, hair washing, and the oral contraceptive pill. They did not, however, debate the potential contributory role of psychoactive drugs. We found this surprising, since many recreational drugs can affect salivary cortisol, and may affect cortisol levels in hair. We have previously demonstrated that the methamphetamine derivative 3,4-methylenedioxy-methamphetamine (MDMA) can substantially affect both salivary and hair cortisol. In a prospective study of young recreational MDMA users, the peak increase in salivary cortisol was around 800%, when compared to the same dance clubbers during an equivalent weekend of voluntary abstinence (Parrott et al., 2008). More recently we collected hair samples (3 cm near scalp) from 32 light occasional Ecstasy/MDMA users (1–4 times in the last 3 months), 23 heavier recent Ecstasy/MDMA users (+ 5 times in last 3 months), and 54 non-user controls (Parrott et al., 2014a). Levels of cortisol in hair were significantly higher in the recent Ecstasy/MDMA users (mean 55.0 pg/mg), when compared to both nonusers controls (mean 13.8 pg/mg; $p < 0.001$), and light users (mean 19.4 pg/mg). The 400% increase in hair cortisol for the heavier users may be part of a wider pattern of hypothalamic–pituitary–adrenal axis (HPA) changes, since abstinent Ecstasy/MDMA users also show changes to the cortisol awakening response, and other indications of increased stress (Parrott et al., 2014b). Many other psychoactive drugs can affect the HPA axis, not just stimulants such as cocaine, but also relaxants such as cannabis and their regular use may also differentially affect hair deposits of cortisol. In summary, the measurement of hair cortisol provides a very exciting new methodology for investigating the psychoneuroendocrinological effects of psychoactive drugs. In non-psychopharmacological research, the use of psychoactive drugs may comprise an important source of confounds, for both the accurate measurement of cortisol deposits, and for interpretation of the relationships between psychiatric illnesses that are linked to both altered cortisol production and psychoactive drug use. Future research should monitor their recent usage, possibly using brief questionnaires designed for this purpose (Parrott et al., 2014a). Their employment as co-variables may be particularly relevant for studies involving younger participants – such as university students.

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