Recreational drug users who switch from ecstasy to mephedrone don't understand the dangers

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Contrary to popular belief among recreational drug users, mephedrone has several important differences when compared with MDMA, commonly known as ecstasy. These differences mean that mephedrone could leave a user with acute withdrawal symptoms and indicate that it may have a higher potential for developing dependence than MDMA according to a study published in *British Journal of Pharmacology*.

"Although users report that mephedrone produces similar psychoactive effects to MDMA, these two drugs produce different changes in the brain and the adverse effects they produce, particularly when ingested with other drugs, will therefore be different," says Professor Richard Green, who works at the School of Life Sciences at the University of Nottingham and is a Trustee of the British Pharmacological Society.

In their review of current scientific and medical research, Professor Green and his colleagues concluded that there were only two harmful effects on users associated with MDMA that mephedrone did not replicate: monoamine neurotoxicity in the brain and hyperthermia, both of which can be problems with MDMA.

Reports show that users of mephedrone tend to take repeated doses over a short period. This binge use may induce more severe adverse consequences including the risk that they could become dependent on the drug, say the researchers.

Preclinical studies of mephedrone in laboratory animals indicate a number of reasons why the drug can become more rewarding than MDMA:

• Mephedrone rapidly gets into the brain, so it gives a quick effect. It is then rapidly broken down and cleared. This spike is likely to lead to a range of acute withdrawal symptoms that do not occur with MDMA, which has slower brain penetration, metabolism and clearance.

• The way that mephedrone interacts with neurotransmitter transporters and/or receptors in the brain means that it has a greater stimulant action than MDMA giving the user a highly positive mood, but it does so in a way that will also tend to have a high psychostimulant and abuse liability. While MDMA also produces a positive mood, the way it operates causes less of a psychostimulant effect than mephedrone.

"One of the key messages for medics and drug users is that even though psychostimulant drugs may initially seem similar, the differences in the way they work can be critical," says Green, who published the findings in the *British Journal of Pharmacology*. "The good news is that the effects seen in animal studies generally reflect the reported changes in humans, which gives us confidence that the warning signals on the relative risks of different drugs from these studies need to be taken seriously."

More information: A R Green, M V King, S E Shortall and K C F Fone. The preclinical pharmacology of mephedrone; not just MDMA by another name. British Journal of Pharmacology. 2014. Published Online: March 25, 2014. DOI: 10.1111/bph.12628

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