

BEAT DRUGS FUND

Project: Surveillance of emerging drugs of abuse in substance abusers

Project reference no.: BDF 101021

Project Summary

There has been an increasing usage of novel psychoactive substances (NPS) in recent years worldwide. Some of these drugs have been reported to cause considerable harm and even fatalities. However, currently many of these NPS cannot be detected by routine drugs of abuse testing in most clinical laboratories. The aim of this study was to establish a chromatography-based analytical system for the detection of both conventional drugs of abuse (DOAs) and NPS in urine and hair; and subsequently, to apply this system in drug abusers and high-risk individuals as surveillance of DOAs, in particular NPS. In total, 2000 urine and hair samples were collected from susceptible populations, including subjects recruited from A&E departments, substance abuse clinics, various rehabilitation centres as well as youth outreach facilities. Sample preparation entails enzyme digestion and solid phase extraction for urine; and simultaneous micropulverization/ extraction for hair. Analytes were detected by liquid-chromatography tandem mass spectrometry (LC-MS/MS). Forty-seven conventional DOA analytes (28 parent drugs and 19 metabolites) and 47 NPS analytes (45 parent drugs and two metabolites) are covered by the established method, which has been validated according to international guidelines. Analysis of the 2000 urine and hair samples revealed the presence of three NPS in five samples - PMMA was detected in three hair specimens; TFMPP and methcathinone were detected in separate urine specimens. Of the conventional DOAs, codeine, methadone, heroin and ketamine were the most frequently detected analytes. To conclude, incorporation of novel psychoactive substances into the routine drugs of abuse testing service can allow surveillance of these continually emerging drugs. Early identification of NPS can help improve the clinical management of patients, and on a wider scale the legislation, education and preventive policies of the society.