World Academy of Science, Engineering and Technology
International Journal of Pharmacological and Pharmaceutical Sciences
Vol:13, No:07, 2019

Detection of Some Drugs of Abuse from Fingerprints Using Liquid Chromatography-Mass Spectrometry

Authors : Ragaa T. Darwish, Maha A. Demellawy, Haidy M. Megahed, Doreen N. Younan, Wael S. Kholeif

Abstract : The testing of drug abuse is authentic in order to affirm the misuse of drugs. Several analytical approaches have been developed for the detection of drugs of abuse in pharmaceutical and common biological samples, but few methodologies have been created to identify them from fingerprints. Liquid Chromatography-Mass Spectrometry (LC-MS) plays a major role in this field. The current study aimed at assessing the possibility of detection of some drugs of abuse (tramadol, clonazepam, and phenobarbital) from fingerprints using LC-MS in drug abusers. The aim was extended in order to assess the possibility of detection of the above-mentioned drugs in fingerprints of drug handlers till three days of handling the drugs. The study was conducted on randomly selected adult individuals who were either drug abusers seeking treatment at centers of drug dependence in Alexandria, Egypt or normal volunteers who were asked to handle the different studied drugs (drug handlers). An informed consent was obtained from all individuals. Participants were classified into 3 groups; control group that consisted of 50 normal individuals (neither abusing nor handling drugs), drug abuser group that consisted of 30 individuals who abused tramadol, clonazepam or phenobarbital (10 individuals for each drug) and drug handler group that consisted of 50 individuals who were touching either the powder of drugs of abuse: tramadol, clonazepam or phenobarbital (10 individuals for each drug) or the powder of the control substances which were of similar appearance (white powder) and that might be used in the adulteration of drugs of abuse: acetyl salicylic acid and acetaminophen (10 individuals for each drug). Samples were taken from the handler individuals for three consecutive days for the same individual. The diagnosis of drug abusers was based on the current Diagnostic and Statistical Manual of Mental disorders (DSM-V) and urine screening tests using immunoassay technique. Preliminary drug screening tests of urine samples were also done for drug handlers and the control groups to indicate the presence or absence of the studied drugs of abuse. Fingerprints of all participants were then taken on a filter paper previously soaked with methanol to be analyzed by LC-MS using SCIEX Triple Quad or QTRAP 5500 System. The concentration of drugs in each sample was calculated using the regression equations between concentration in ng/ml and peak area of each reference standard. All fingerprint samples from drug abusers showed positive results with LC-MS for the tested drugs, while all samples from the control individuals showed negative results. A significant difference was noted between the concentration of the drugs and the duration of abuse. Tramadol, clonazepam, and phenobarbital were also successfully detected from fingerprints of drug handlers till 3 days of handling the drugs. The mean concentration of the chosen drugs of abuse among the handlers group decreased when the days of samples intake increased.

Keywords : drugs of abuse, fingerprints, liquid chromatography–mass spectrometry, tramadol
Conference Title : ICTAP 2019 : International Conference on Toxicology and Applied Pharmacology
Conference Location : Paris, France
Conference Dates : July 18-19, 2019

Open Science Index, Pharmacological and Pharmaceutical Sciences Vol:13, No:07, 2019 publications.waset.org/abstracts/102148.pdf