The Effect of Oral Contraceptive Pills on the Detection of Illicit Drugs in Biological Fluids: Animal Based Mode

Study by: Alaa Abdulrahman AL-Banna
Supervisor Dr. Feras Darwish El-Hajji
Co-supervisor: Dr. Muna Barkat

ABSTRACT

***1.1 Background*:**
Prescription and non-prescription drugs were manufactured and invented to treat and enhance physical and psychological health state. Unfortunately, reports of drugs misuse and abuse started to increase with time. People who are 12 years and older are involved in drugs abuse worldwide. Starting with pain relief, euphoria feelings, gain self-confidence, and ending with sport performance enhancement were all other reasons for drug abuse and addiction. Governments start to fight this phenomenon and agencies were established to monitor study and limit those actions using urine-drug- screenings kits to detect drugs abuse. Abusers start developing methods to manipulate and pass those tests through many adulteration techniques applied on tested urine samples. Diuretics intake, commercial detoxifying reagent and urine exchange are some of many ways are used to manipulate drug-screening tests. Many observations from community pharmacists of the use and intake of oral contraceptive pills (OCPs) by male abusers to mask illicit drugs abuse in urine tests were recorded. A study in 2017 was conducted in Iran related to test the claims of using OCPs in order to manipulate urine morphine tests. My own observations as an owner of a community pharmacy of purchasing OCPs regularly by male abusers. Those were the reasons to start a study conducting the effect of OCPs on the detection of illicit drugs in urine tests. Our study used a combined oral contraceptive microgynon® and yasmin® among illicit drugs abused rats to detect the effect of oral contraceptives on the results of urine drugs screenings.

1.2* Methods*:
Wister Albino male rats were sectioned into two units where each unit has six groups, ten rats in each group. Pregabalin and diazepam (benzodiazepine) are our tested illicit drugs. Microgynon®(levonorgestryl/Ethinylestradiol)(LE/EE) and yasmin® (drospirenone/Ethinylestradiol)(DRSP/EE) are our tested combined oral contraceptives. Both units deal with the same illicit drugs but differ in the oral contraceptive (OCPs) used. Unit one groups handle microgynon®where group 1 is the control group where the tested rats didn't take any drugs or vehicles. Group 2 is where the rats take Pregabalin for 7 days (abused group). Group 3 took diazepam for 12 days (abused group). Group 4 took microgynon® only for 7 days. Group 5 took pregabalin until abused state is reached and the Microgynon® intake starts for another 7 days. Group 6 reached abused state of diazepam before microgynon®intake starts for another 7 days. Unit two groups handle yasmin®as the tested OCPs where group 1 is the control group same as the previous one. Group 2 is where the rats take Pregabalin for 7 days (abused group). Group 3 took diazepam for 12 days (abused group). Group 4 took yasmin® only for 7 days. Group 5 took pregabalin until abused state is reached and the yasmin® intake starts for another 7 days. Group 6 reached abused state of diazepam before yasmin®intake starts for another 7 days. Urine samples were collected and tested several times among 60 hours' period for the completely first four groups in both units. Urine samples were collected and tested

several times among 24 hours after each OCPs dosing for the 5th and 6th group in both units. Urine drug screening kits (ALL TEST®) were used to detect the presence and absence of those illicit drugs. Rotarod and hot plate tests were applied on all groups of both units also to measure the effect of oral contraceptives intake on behavior and records among tested groups. Rounds per minute (rpm) counts at Rotarod test and the recorded time where rats start to express pain in hot plate tests are our parameters to detect any difference between the groups and relate them to OCPs intake.

1.3 Results:

At unit one, all Pregabalin abused groups were tested through ALL TEST® urine kits and the drug was clearly positively detected through the kits despite the administration of oral contraceptive pills. Results of Rotarod test and hotplate test recorded no difference between Pregabalin abused group and the one took oral contraceptive drug. Benzodiazepine abused groups showed uncertain presence nor absence of the drug metabolites in urine where further urine tests should be repeated. Results remain uncertain for another three days until no more detection of the drug result obtained. Rotarod and hot plate tests showed a slightly difference between the results of diazepam abused group and oral contraceptive/diazepam group. At unit two, different results were obtained with yasmin® where positive detection of illicit drugs obtained with some rats of the same group and another negative detection of the same illicit drugs with the other rats. Conflicted and unexplained results were obtained from yasmin® unit and no further tests were applied during our study.

1.4 Conclusion:

This study demonstrated that oral contraceptives have no effect on the detection of illicit drugs in urine but may contribute with uncertain results among specific drugs. More tests on different illicit substances are recommended and future studies are required to understand the rationale behind the improper use of OCP to mask illicit drug detection. Blood samples collection and analyzing through high performance liquid chromatography (HPLC) should be considered to evaluate more details that can't be tested through urine test kits. Educational campaigns are also required to spotlight the side effect of regular oral contraceptive intake by males on their health. Restrictions on OCPs dispensing may be considered to limit the misuse of them.