

COMBINED INTOXICATIONS WITH HEROIN AND COCAINE – SPEEDBALL. TWO CASE REPORTS

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ABSTRACT

Two cases of fatal outcomes due to combined poisonings with drugs – heroin and cocaine (“speedball”) are presented. Both cadavers were examined at the Department of Forensic Medicine and Deontology, Sofia – forensic medical autopsies, histological examination and toxicological analysis were performed in order to establish the cause and manner of death.

During the examination of the cadavers there were some similar findings: absence of needle stitches – a fact that refers to inhalatory administration of the drugs; presence of little-bubbled foam around the nostrils and mouth. By the internal examination there were established unspecific findings - the so called “white autopsy”: severe circulatory disorders with brain edema, severe acute lung cardiogenic edema - little-bubbled foam in the bronchi, as a result of the acute cardiac insufficiency. The toxicological analyses of standard samples from the cadavers showed presence of toxic concentrations of heroin and cocaine metabolites. By the histological examination were established nonspecific findings in the heart and lungs.

Combination between stimulant and opiate, cocaine and heroin in these cases, may lead to acute poisoning and overdosing after intake of “normal” dose as a result of superimposition of the direct and indirect toxic effects of the drugs. This may be the cause of acute heart failure and quickly occurring death.

Key words: drug abuse; combined intoxications; heroin, cocaine

INTRODUCTION

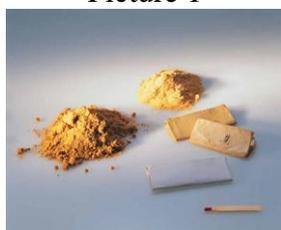
By the year of 2009 approximately 0,4% of Bulgarians use illicit substance. (Национален фокусен център за наркотици и наркомании, 2010г.). The biggest share of morbidity and mortality due to drug abuse are amongst heroin addicts. Heroin is mainly produced in Afganistan – Golden Crescent (Европейски център за мониторинг на наркотиците и наркоманиите, 2011г.; Illicit Drug Data Report 2003–04).

Heroin (Picture 1) is opiate derivative, isolated from opium poppy - *Papaver somniferum* (Illicit Drug Data Report 2003–04). Heroin psychical and physical dependence is quickly developed. There are many direct and indirect effects, which in great percentage of the cases lead to death (Александров, 2010; Alexandrov et al, 2012a; Alexandrov et al, 2012b; Shewan et al, 2005). Heroin is mostly administrated by intravenous injection or inhalation (Picture №2). The main effects of heroin include: sense of euphoria and pleasure; reduction of pain perception, anxiety, stress, hunger, libido; nausea, vomiting (Караджов, 2001). Heroin addicts need several milligrams daily to avoid the withdrawal syndrome (Shewan et al, 2005).

Death due to heroin abuse in most of the cases is a result of “overdosing” with “street” heroin, because in a standard dose of “street” street heroin there is often different quantity pure drug - acute intoxication. (European Monitoring Centre for Drugs and Drug addiction-2008; Европейски център за мониторинг на наркотиците и наркоманиите, 2011г.). Death may occur as a result of combined intoxication, aspiration of vomited stomach contents, accidents, suicides, disease and complications related to the chronic drug abuse, that depend on the continuity of drug abuse, way of administration, noncompliance with asepsis and antisepsis, impurities, especially in drug addicts using heroin intravenously (Александров, 2010; Alexandrov et al, 2012a; Alexandrov et al, 2012b).

Cocaine (Picture №3) is natural stimulant produced from the leaves of *Erythroxylon coca*, mainly in the Andean region – Columbia, Peru, Bolivia (Burnett, 2012; Европейски център за мониторинг на наркотиците и наркоманиите, 2011г.). After marijuana and hashish, cocaine is the second most traded drug worldwide (Европейски център за мониторинг на наркотиците и наркоманиите, 2011г.). The primary effect of cocaine is block of the norepinephrine reuptake and the secondary is releasing of norepinephrine in the synaptic cleft. Its anesthetic effect is a result of blockage of Sodium channels. Cocaine might be administrated intravenously or inhalatory, or to be smoked with crack pipes (Picture № 4) (Burnett, 2012). The main effects of cocaine are: vasospasm; increase of blood pressure; pulse acceleration; increase of respiratory frequency; sense of unlimited physical and psychical abilities; megalomania; agitation. Quick depletion of cocaine effects is very common, which is the cause taking it in the so called “rounds” periodically in every 20-30 minutes. The fatal outcome due to cocaine abuse may occur as a result of dysrhythmias, coronary incidences, MI, ischemic and hemorrhagic brain insults, agitated delirium, hyperthermia, cocaine-associated rhabdomyolysis, metabolic acidose (Burnett, 2012).

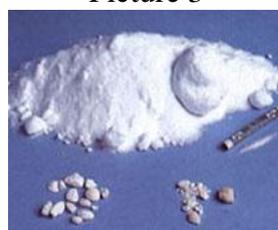
Picture 1



Picture 2



Picture 3



Picture 4



Combination of heroin and cocaine – speedball is often abused. First heroin is injected or snored and right after that cocaine is snored or injected, or crack is smoked. The dependence to this combination is very quickly developing, because of the effects of both drugs (Burnett, 2012).

MATERIALS AND METHODS

Full forensic medical examination of the cadavers including external and internal examination, histological examination, toxicological analysis.

CASES PRESENTATION

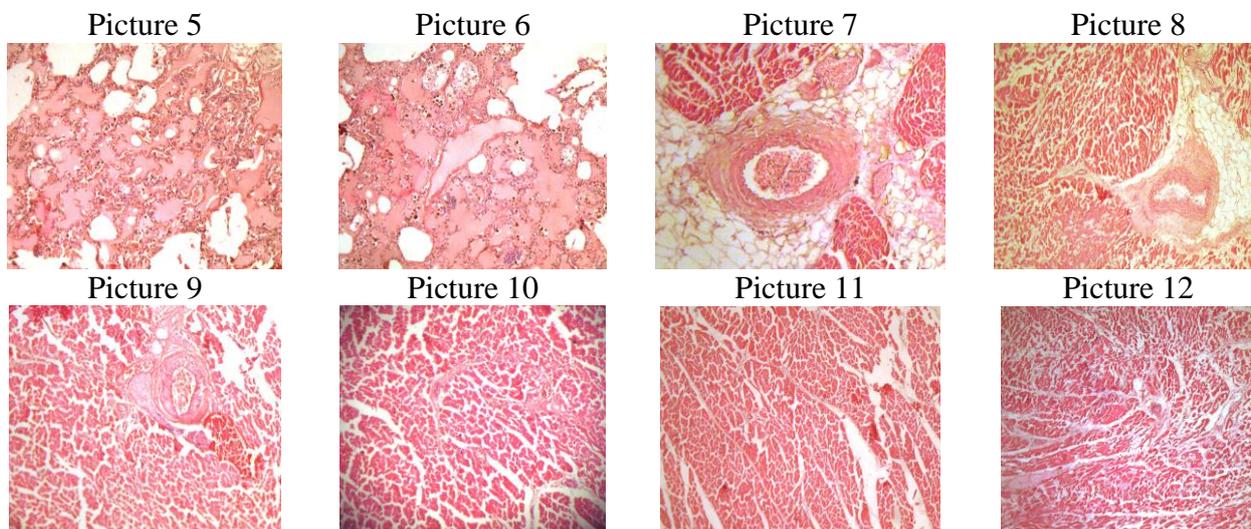
Two fatal outcomes due to heroin/cocaine abuse are presented. Key moment in the genesis of death was acute heart failure with acute cardiogenic lung edema and acute respiratory insufficiency.

The first of the cases was a deceased 32-years old man. By the external examination were established the following findings: well-developed muscle system, drying little-bubbled brownish foam around mouth and nostrils; bruxism appliance, teeth abrasio; no needle stitches. During the internal examination were found severe cerebral edema and congestion; severe lung edema and multiple dot-like hemorrhages under the pleurae; left ventricle hypertrophy; hepatosplenomegaly; fatty liver; arteriosclerotic nephrosclerosis; purulent pyelonephritis.

The second case is 21-years old deceased man. The cadaver looks older than he actually is, the muscle system is very well developed, there is the same as described foam around the mouth and nostrils, several tattoos, some of them with antisocial symbols, no needle marks. During the internal examination were established: severe cerebral edema and congestion; severe lung edema and multiple dot-like hemorrhages under the pleurae; hydrothorax in the left thoracic half; left ventricle hypertrophy; arteriosclerotic nephrosclerosis.

Toxicological analysis in both cases showed presence of cocaine and heroin metabolites in toxic concentrations.

The histological findings in both cases were: severe lung edema (Pictures №№5, 6), presence of hemosiderin laden macrophages (Picture №6); hypertrophy of small arteries and arterioles in the heart (Pictures №№7, 8, 9); myocardiofibrosis (Pictures №№.10, 11, 12).



DISCUSSION

In the both cases the cause of death was combined intoxication, with probable inhalatory administration of drugs, which led to quickly occurring death due to acute cardiac failure and severe cell ischemia. Tattoos with antisocial symbols might imply drug abuse as a form of antisocial behavior (Preda, 2011).

In both of the cases there were arterial hypertonic disease and ischemic heard disease, which is probably effect of drug abuse, especially of the 21-years old man. This can be explained with the increased production of vasoconstrictor factors such as endothelin, and decrease production of vasodilators such as NO, which is one of the main cocaine effects (Burnett, 2012; Preda, 2011). The result of these effects are multiple increases of blood pressure, coronarospasms and myocardial ischemia – early developing severe hypertonic and ischemic diseases (Александров, 2010; Alexandrov et al, 2012a; Alexandrov et al, 2012b; Karch, 2012). The presence of hemosiderin laden macrophages shows previous hemorrhages in the lung, connected with the inhalatory drug administration and local irritation of the administrated substances. The abrasions an erosions of teeth is a result of pathological increased muscle tonus of the masticatory muscles during heroin withdrawal and as a direct effect of cocaine (Александров, 2010). Tattoos with antisocial symbols might infer drug abuse as a form of antisocial behavior (Preda, 2011), which was the cause of wearing bruxism appliance.

CONCLUSION

Combined intake of more than one illicit substances carries a greater risk of fatal outcome. This fact can be explained with combining and potentiation of the toxic effects, which is the cause of overdosing with smaller quantities of the drugs of abuse.

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FIGURE LEGEND

Picture 1 – Heroin.

Picture 2 – Smoking of heroin steams.

Picture 3 – Cocaine.

Picture 4 – Crack pipe.

Pictures 5, 6 - Severe lung edema, HE, 10x25.

Picture 6 - Hemosiderin laden macrophages in the lungs HE, 10x25.

Pictures 7-9 - Hypertrophy of small arteries and arterioles in the heart. HE, 10x25.

Pictures 10-12 – Myocardiofirosis HE, 10x25.