

**ILLICIT DRUGS - EXTERNAL SIGNS OF DRUG ADDICTION**

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**ABSTRACT:**

**Introduction:** Heroin is an extremely addictive substance, one of the most commonly abused drug worldwide. The substance derives from opium from the poppy plant before it is refined to morphine, then further chemically modified to become heroin. The different forms of heroin that are sold on the drug market can be smoked, snorted, or injected under the skin, into muscle, or directly into the veins. The aim of this study was to determine the basic macroscopic external signs of prolonged heroin drug abuse. **Materials and methods:** For the period 2011-2017 in the department of forensic medicine and deontology were performed 257 full forensic medical autopsies of deceased with positive toxicology analysis for illicit drugs. In 136 of the cases heroin was present. The deceased were in the age group between 20-40 years. **Results:** During the external examination on one hand, we observed the well-known changes to the skin presented by needle marks and bruising on the injection sites. On the other hand we found characteristic scars on the skin in the areas of multiple application of the drug as well as changes to the teeth and gums such as missing teeth, loss of enamel, multiple cavities, gingivitis, periodontitis, etc., which are more common in elderly people. **Discussion and conclusion:** Drug abuse affects people from all socioeconomic statuses and ages, especially young people. With some psychoactive substances like heroin, tolerance and dependence develop very fast and it can be extremely difficult to stop using drugs without effective professional treatment. Therefore, the on time diagnosis is essential.

**Key words:** *heroin addiction, external signs, skin changes heroin, teeth and gums changes*

**Introduction:**

Heroin is an extremely addictive substance, one of the most commonly abused drug worldwide. Many people use it recreationally in order to feel the euphoric high that comes with it, but unfortunately, that brief high comes with devastating consequences. The substance derives from opium from the poppy plant before it is refined to morphine, then further chemically modified to become heroin. The different forms of heroin that are sold on the "drug market" have different ways of administration depending mainly on the purity of the drug and the preference of the user. Heroin can be injected into a vein or a muscle; it can be smoked in a pipe or mixed with a marijuana joint or a regular cigarette [1]. In addition, its smoke can be inhaled through a straw, a process known as "chasing the dragon." As a powder, it can be snorted. Users who inject heroin feel its effects the quickest [1, 2]. When heroin is mainlined, users can usually

begin to experience a feeling of euphoria within seven to eight seconds, while when it is smoked, the user will typically feel its peak effects in 10 to 15 minutes [1, 3, 4]. No matter how heroin is used –injected, snorted or smoked – it is highly addictive due in part to the development of tolerance to the drug, which requires greater dosages to achieve the same results. After administration of heroin addicts display certain signs such as small pupils, confusion, and periods of alertness that are quickly followed by sudden drowsiness, dry mouth and shortness of breath [5, 6, 7]. Unfortunately, these signs are mostly missed at the beginning. Every medical practitioner should learn the most common signs of addiction so they can give help immediately to such patients, to avoid a fatal outcome.

The aim of this study was to determine the basic macroscopic external signs of prolonged heroin drug abuse from the forensic perspective.

### Materials and methods:

For the period 2011-2017 in the department of forensic medicine and deontology were performed 257 full forensic medical autopsies of deceased with positive toxicology analysis for illicit drugs. In 136 of the cases heroin was present. The deceased were in the age group between 20-40 years.

### Results and discussion:

During the external examination of deceased in the Department of Forensic medicine and deontology, medical University of Sofia in 57 of the cases we observed changes to the skin. Even though some symptoms of heroin abuse take weeks or months to develop, the first signs of this type of drug use [1] are the injection marks /IM/ (Figure 1). Heroin users who inject the drug intravenously for a long period often develop track marks on their inner arms, since this is the most common site for injections (Figures 2 and 3).



**Figure 1. A single injection mark (arm)**



**Figure 2. Track marks on inner surface of arm**



**Figure 3. Track marks (arm).**



**Figure 4. Track marks (groin).**

However, there are other areas of application such as inner surface of the legs, groin, inbetween the fingers of the hands or feet (Figures 4-6), or even in unsuspected areas like underneath the tongue (Figures 7 and 8), as we observed in one of our cases [2,3].



**Figure 5. Injection marks on feet**



**Figure 6. A needle inserted in the femoral vein**



**Figures 7: Injection mark underneath the tongue**



**Figure 8: Suffusion underneath the IM.**

Common complications after heroin injections are skin infections and abscesses (Figures 9 and 10), especially among chronic injectors who suffer from scarred or collapsed veins. Furthermore, these infections could be attributed to the lack of aseptic application of the illicit

drug, as well as the lowered immunity of the drug addict due the illicit drug itself or accompanying diseases such as AIDS/HIV [3, 4].



Figure 9. Abscess foot - healing process



Figure 10. Abscesses hands – healing process

In addition, we found presence of oval scars with funnel-like bottom in hidden sites of application, such as the inguinal area and the superior aspect of the penis (Figures 11 and 12). In some cases, there were necrotic changes of the skin surrounding the scars [4]. Also, fibrous tissue between the scar and the vessel, formation of chronic fistulas, infiltration with blood in cases of drug injection prior to death, thromboses of the underlying vessels, retraction of the vessels, purulent inflammation were observed during the internal examination of the deceased. Although, veins were affected in the majority of cases, injuries of arteries were also seen. Establishing of oval scars with funnel-like shape, in complex with skin and underlying soft tissues changes, refers to repeated intravenous or intra-arterial drug application. Such autopsy or possible biopsy findings give ground for consideration of possible drug abuse and taking samples for toxicological analysis.



Figure 11. Scars from repeated drug application - groin



Figure 12: Scars on penis



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It should also be mentioned that drugs can damage not only the skin but also teeth, and detrimental dental effects vary depending on the substance. In some of the cases observed of deceased with prolonged heroin abuse, we have noticed problems for teeth and gums, due to several factors [5, 6]. On one hand, it causes dry mouth, because less saliva is produced responsible for “cleaning the teeth”. On the other hand, it can make the drug addict clench or grind their teeth, which causes pain in the jaws, weakens the teeth and leads to loss of enamel and in some cases fractures of the tooth crown [7]. In addition, heroin addicts take less care of their oral hygiene; they do not visit regularly their dentist, which can let decay quickly get worse [5]. Opioids like heroin can cause craving for sugary drinks, candy and sweets as well. Due to the above-mentioned factors, people who inject heroin usually have rotten, discolored, broken, and missing teeth, as well as gum disease [6] and oral infections [7] (Figures 13-15).



**Figure 13. Rotten and missing teeth with decay, broken teeth of heroin drug addicts**



**Figure 14: Caries-non-resistant patient, DMFT over 10 with cheilitis and angulitis (mucosal recurrent lesions), negative for Hepatitis B and C, and AIDS; 26 years old male drug addict;**



**Figure 15: X-ray image of teeth; Missing tooth; 26 years old male drug addict**

All the above-mentioned changes to the teeth and gums such as missing teeth, loss of enamel, multiple cavities, gingivitis, periodontitis, etc., are more common in elderly people. Even though, during our examination we observed them in young people in the age range of 20-40 years.

#### **Conclusion:**

Drug abuse affects people from all socioeconomic statuses and ages, especially young people. With some psychoactive substances like heroin, tolerance and dependence develop very fast and it can be extremely difficult to stop using drugs without effective professional treatment. Therefore, the joint work of physicians and dentist and the on time diagnosis are essential.

Statement for Potential Conflicts of Interest: There is no potential conflict of interest.

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