

Opiates Drug Information

Classification

The term "opioid" refers to all drugs, natural or synthetic, with morphine-like properties. Both morphine and codeine are naturally occurring alkaloids derived from the seed pod of the opium poppy. Semi-synthetic opiates include heroin, a diacetyl derivative of morphine; hydromorphone, hydrocodone, and oxycodone derived by a simple modification of the morphine molecule. Synthetic opiates such as methadone and meperidine, mimic opiate effects but are not prepared from the poppy. The drugs may be administered by snorting, subcutaneous or intravenous injection, or smoking. Opioid compounds have analgesic and antitussive properties.

Metabolism

Morphine is rapidly absorbed. Plasma peak levels following an oral dose occur after 15-60 minutes, and following IV injection occur after 15 minutes. Extensively metabolized by the liver, only 2-12% is excreted as unchanged drug, while 60-80% is excreted as morphine-3-glucuronide. The half-life of morphine is 1.7-4.5 hours. Heroin is rapidly metabolized (plasma half-life is 3 minutes), first to 6-monoacetylmorphine (6-MAM) and further to morphine. The urinary excretion profile is similar to morphine, in that 7% is excreted as unchanged morphine and 50-60% as glucuronides. Trace amounts of 6-MAM, a specific metabolite of heroin, are also excreted for approximately 6-8 hours following heroin use. Following an oral dose, codeine is also rapidly absorbed and metabolized, principally to codeine-6-glucuronide, with 10-15% metabolized to morphine and norcodeine. Opiates may be detected in urine for 2-4 days following ingestion.

The interpretation of results for urines positive for opiates merit special consideration. Since codeine is metabolized to morphine, both substances may appear in the urine following codeine ingestion. However, the codeine concentration is generally greater than that of morphine. Street heroin also contains acetylcodeine, which metabolizes to codeine, therefore, both codeine and morphine may be present in the urine of some heroin users, although morphine generally predominates. In cases of low morphine and codeine concentrations in urine, it is not possible to determine whether codeine, morphine, or heroin were ingested. The presence of morphine alone would generally indicate either clinical morphine use or illicit morphine or heroin use. A specific metabolite of heroin, 6-monoacetylmorphine, is also at times detected and would definitely confirm illicit drug (heroin) use. Poppy seeds, which have not been effectively washed, contain trace amounts of codeine and morphine. When consumed in sufficient amounts, poppy seeds may produce urines which test positive for opiates.

Abuse

Opioid compounds have effects on the CNS and usually on the bowel. They produce analgesia, respiratory depression, euphoria, mood changes, confusion, and constipation. Tolerance and dependence develop with repeated use, with overdose being characterized by coma, respiratory depression, and pinpoint pupils. Discontinuing the drug in a dependent individual will precipitate a withdrawal syndrome. Heroin and morphine are the most commonly abused opioid compounds; however codeine, propoxyphene, oxycodone, hydrocodone, etc. are also extensively abused, as they are more readily available. Most heroin and morphine abusers inject or "mainline" the drugs intravenously, as this produces the most immediate and intense effects. The heroin or morphine "rush" is the most desired sensation which is characterized by an intense orgasmic sensation centered in the abdomen.

Laboratory drug testing: Methods of Analysis

The immunoassay methods such as enzyme immunoassay (EIA) detect codeine and morphine in free and conjugated forms at cutoff levels of approximately 300/2000ng/mL or less. Other opioids detected by immunoassay at higher cutoff levels are hydrocodone, hydromorphone, while the routine detection of oxycodone requires a more sensitive and specific immunoassay screen. Since the immunoassays do not distinguish between the various narcotics, a confirmation method is required that can specifically identify these compounds. Methods commonly used include gas chromatography/mass spectrometry (GC/MS) or liquid chromatography/tandem mass spectrometry (LC/MS/MS). These methods determine the total morphine and codeine content in the urine specimens. Since 90% of these compounds are conjugated in the urine, acid or enzyme hydrolysis is required to convert the conjugated form into the free form.

