Buprenorphine Drug Information

Classification

Buprenorphine (Suboxone, Subutex) is a semi-synthetic thebaine derivative that has both analgesic and opioid antagonist properties. As an analgesic, buprenorphine is approximately 25 to 40 times more potent than morphine and as an opioid antagonist it is roughly equivalent to naltrexone. Buprenorphine is prescribed in the hydrochloride form and therapeutic dosages range from 0.3 - 0.6 mg when given parenterally, or 0.2 - 0.4 mg sublingually, every 6 - 8 hours. The use of larger daily doses (2 - 16 mg daily) have been used successfully for the treatment of opiate withdrawal or maintenance. Overdose symptoms include confusion, dizziness, pinpoint pupils, hallucinations, hypotension, respiratory difficulty, seizures and coma. Fatalities due to buprenorphine overdosage alone and by poly-drug use have been reported.

Metabolism

Buprenorphine is rapidly metabolized in the liver by the cytochrome P450 system to form a pharmacologically active N-dealkylated metabolite, norbuprenorphine and glucuronide conjugates. Buprenorphine and norbuprenorphine are excreted in urine almost exclusively as glucuronides with very little free drug being detected. Studies indicate that concentration of free buprenorphine and norbuprenorphine in urine can be less than 1 ng/mL following therapeutic administration, but can range up to 20 ng/mL in abuse situations. Total buprenorphine and norbuprenorphine concentrations in urine, ranging from 0.5 - 2936 ng/mL and 4.0 - 4462 ng/mL respectively, have been reported following daily doses between 0.2 - 24 mg. The corresponding median norbuprenorphine to buprenorphine ratio was 0.23. However, there is significant inter- and intra-individual variability in the ratio because the elimination kinetics of norbuprenorphine are slower; therefore, the ratio is greatly influenced by dosage and sample time. Approximately 95% of a labeled dose is excreted within 144 hours, 68% in the feces and 27% in the urine.

Abuse

Like methadone when buprenorphine is taken by an individual who is addicted to heroin or other opioid, buprenorphine reduces craving and helps the person remain drug-free. Because of its opioid effects, buprenorphine can also be abused, particularly by individuals who are not physically dependent on opioids. Compared with methadone, buprenorphine has a relatively lower risk of abuse, dependence, and side effects, and it has a longer duration of action. Because buprenorphine is a partial opioid agonist, its opioid effects, such as euphoria and respiratory depression, as well as its side effects, reach a ceiling of maximum effect, unlike with methadone or heroin. For this reason, buprenorphine may be

safer than methadone, as long as it is not combined with sedatives such as tranquilizers or alcohol. The side effects of buprenorphine are similar to those of other opioids and may include nausea, vomiting, and constipation. Both buprenorphine and buprenorphine with naloxone can result in the opioid withdrawal syndrome if used by people on high doses of other opioids. Symptoms of opioid withdrawal can include: dysphoria, nausea and vomiting, muscle aches and cramps, sweating, tearing, diarrhea, mild fever, running nose, insomnia, and irritability.

Laboratory drug testing: Methods of Analysis

Enzyme immunoassay (EIA) is used as a screening method for the detection of buprenorphine. The assay has equal cross reactivity to norbuprenorphine, the primary urinary metabolite of buprenorphine. Confirmation of screened positive urines should be performed by a specific method such as gas chromatography-mass spectrometry (GC/MS) or liquid chromatography-tandem mass spectrometry (LC/MS/MS).