

SOMNIFEROUS POISONS



- This group of poisons are called somniferous or narcotic because their preparations are used therapeutically to lessen pain and induce sleep. Though there are numerous examples of drugs that produces such effects ,this group includes only those that are derived from opium i;e the **opiates** .those who have similar action but not derived from opium are often designated as the **opioids**.

SOMNIFEROUS POISONS

- Narcotic drugs were the term employed to categorize these agents .examples are
- Opium
- Morphine
- Heroin
- codeine

Classification

- Opium and its derivatives are classified as
- 1 . **natural** e.g. morphine ,codeine
- 2 . **Semi synthetic** e.g. heroin.
hydromorphine,oxy morphine
- 3.**synthetic**;e.g.meperidine,
methadone,
fentanyl etc

opium

- Common name **afim**
- Opium is the dried extract of the **poppy plant** (papaver somniferum)



Opium

- Each plant bears 5-8 capsules which are incised to extract the serum. It is white when fresh later brownish.
- Its seeds are harmless and contains no opium (*KhashKhas*).



- Ripe and dried poppy capsules only contain traces of opium
- When fresh is internally moist The milky fluid on drying yields opium
- The crude opium is irregular flattened masses of brownish in color with a characteristic smell and bitter taste.
- Poppy seeds (khaskhas) are creamish seed used as food.

Active Principle

- Phenanthrene Group: Morphine, codeine and thebaine(non analgesic)
- Benzoisoquinoline group: have mild analgesic but no narcotic properties
- Papaverine, noscapine (narcotine).
- Besides these natural products there are number of synthetic substances collectively called *opioids* . Whereas natural products are called *opiates* .

Mode Of Action

Opoids act by acting on **specific opoid receptors**

There are three main receptors located at spinal and supraspinal sites in CNS

1 .The MU receptors: these are relatively selectively specific for opium producing central and peripheral analgesia, euphoria, respiratory depression, GIT dysmotility and miosis.

2.The k (KAPPA) receptors:

- spinal analgesia and miosis.

3.The d (DELTA)

- is important for spinal and supraspinal analgesia.

Toxicokinetics

- In general most opiates are readily absorbed well from GIT and parenterally.
- The effect of an oral dose is quite less due to first pass metabolism in liver.
- Substantial amount is degraded in liver before entering into the circulation. Bioavailability after an oral dose is about 25%.

- The major pathway is conjugation with glucuronic acid to produce morphine-6-glucronide which is also pharmacologically active.
- Unchanged and unconjugated morphine is excreted by colon and by kidneys .small amount is excreted into milk .
- Herion is reduced to morphine by the liver.
- Excretion is through urine as morphine-3-glucronide.
- Duration of action varies from product to product and is from 2-4-6-8 hours.

Clinical features

- *Tirade of pinpoint pupils, respiratory depression and coma is almost always considered as diagnostic of opiate poisoning. the effects occur in three stages*

1 .Stage of excitement

The stage is short

–The person feel better with increase sense of wellbeing, Talkativeness, Restless or hallucination, Flushing of face .the stage may be absent if larger dose is taken .in adults a euphoric feeling of well being usually comes early .In children convulsions are marked feature of this stage

2 Stage of stupor

Headache

Stage of stupor

- Nausea and vomiting
- Giddiness .Drowsiness
- Stupor
- Sense of weight in limbs
- Intense tendency to sleep
- Pupils constricted face and lips cyanosed
- Pulse and respirations are almost normal

3 Stage of narcosis

- Patient passes to deep coma from which he cannot be aroused
- Muscles are relaxed become flaccid, Diminished or absent reflexes
- Hypothermia ,Hypotension ,Bradycardia, Bradypnea
- Non cardiogenic pulmonary edema
- copious frothing from mouth.

Respiratory depression with slow ,sighing breaths the rate is 2 to 4 per min and irregular this result from the decreased response of a brainstem to carbon dioxide tension and is known as ,**cheyne stokes breathing**

- Convulsions
- Cyanosis of extremities
- death

Chronic poisoning

- Dermal scars resulting from repeated injections
- Constricted pupils
- Anorexia amnesia confusion hallucinations
- Constipation
- impotence

Withdrawal

Anticipatory (3-4 hours)	Early (8-10 hours)	Fully developed (1-3 days)	Protracted abstinence (Up to 6 months)
<p>Anxiety Craving Drug seeking behavior</p>	<p>Restlessness, yawning, nausea, sweating, rhinorrhoea, Lacrimation, stomach cramps and drug seeking behavior.</p>	<p>Tremor, vomiting, diarrhoea, muscle spasm, hypertension, tachycardia, fever, chills, Impulse driven drug seeking behavior.</p>	<p>Hypotension, Bradycardia, insomnia, anoxia, stimulus driven drug craving.</p>

Usual Fatal Dose

Opiate	Usual Fatal Dose	Usual Therapeutic Dose
Morphine	200 mg	10-15 mg
Codeine	800 mg	10-60 mg
Heroin	50 mg	—
Crude opium	500 mg	—
Pethedine	1 gm	50-150 mg
Methadone	100 mg	5-10 mg
Pentazocine	300 mg	30-60 mg
Propoxyphene	1 gm	100-150 mg
diphenoxylate	200 mg	10-20 mg

Diagnosis

- Needle marks, dermal scars.
- Hypoglycemia, hypothermia and hypoxia. Most opiate can be detected in blood or urine.

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Treatment

Acute Poisoning

- Supportive measures.
 - Maintenance of airways.
 - Endo-tracheal intubation and oxygen
 - Stomach wash

- **Naloxone is antidote** of choice and does not cause respiratory or circulatory depressant action , aim of naloxone administration is to reverse the respiratory and CNS depression .
- **Physostigmine** to reverse respiratory depression.
- Convulsions may be treated by **benzodiazepines.**

Chronic Poisoning

- Gradual withdrawal of opiates.
- Substitution therapy with less potent drug such as methadone is given as to care of withdrawal symptoms
- Beta adrenergic blocker to relieve anxiety and craving associated with addiction but has no effects on physical symptoms.
- Antispasmodic for abdominal cramps vomiting and diarrhea
- Tranquillizers for sedation, if required
- Psychiatric counseling

Medicolegal aspects

- Opiates and opioids are among the commonest of the drugs of abuse today
- Accidental deaths are relatively common from overdose especially among intravenous abusers of heroin
- Homicidal with opiates is rare
- Opium has been used to commit infanticide especially in the rural areas ,

Post Mortem

- Deep cyanosis, almost black coloured skin
- Blood is very dark. All internal organs are deeply cyanosed.
- Injection marks, dermal abscesses and scarring.
- Froth from mouth and nostrils
- Characteristic smell around mouth in case of oral ingestion of crud opium
- Tattooing (commonly indulged in by drug abusers)
- Emaciation.
- Gross pulmonary edema.
- Cerebral edema.
- Congestion of liver.
- Cyanosis

Heroin was created to find a safer type of morphine and was named presumably due to drugs heroic ability to mimic the effects of morphine without causing addiction

unfortunately heroine is infact highly addictive. heroine is preferred by the addicts due to its more intense action as compared to Morphine it is a white or brown powder depending on where it has

been processed. It can be smoked sniffed or dissolved in water and injected .

- **Autopsy findings** are relatively non specific however certain features can be useful pointers. Presence of injection marks on the antecubital fossa on the front of elbow or into one of the prominent veins of fore arms .
dorsum of the foot may be used when the head and arms have become unusable because of thrombosis and scarring. Tattooing is common among abusers sometimes to conceal old scars or fresh injections sites.

- **Internal abnormality** due to nocotism are not prominent at autopsy . examination of needles scars will reveal previous fibrosis in the intravenous addicts .The long term use of heroin itself causes no damage to the body organs that can be identified at autopsy.
- There may be subtle chronic changes in the reticuloendothelial system which probably result from persistent antigenic stimulation by the unsterile injection of foreign material.

- these changes include **enlargement of lymph nodes** near the liver and pancreas. Prominence of thymus ,mononuclear cell infiltrate in the portal triad of liver .The most striking changes in severe condition are edema of lungs with abundant froth filling bronchi and trachea protruding from nose and mouth this is called **heroine lung**

- **Pathidin** is a colorless crystalline powder with a bitter taste. it is synthetic analgesic having a Morphine like action .it usually produces mioses like all other opiates but not mydriasis .in general 100 mg of pethidine given parenterally is approx equal to 10mg of morphine . Pathidine abuse is not common