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An Assessment Of Opioid Poisoning

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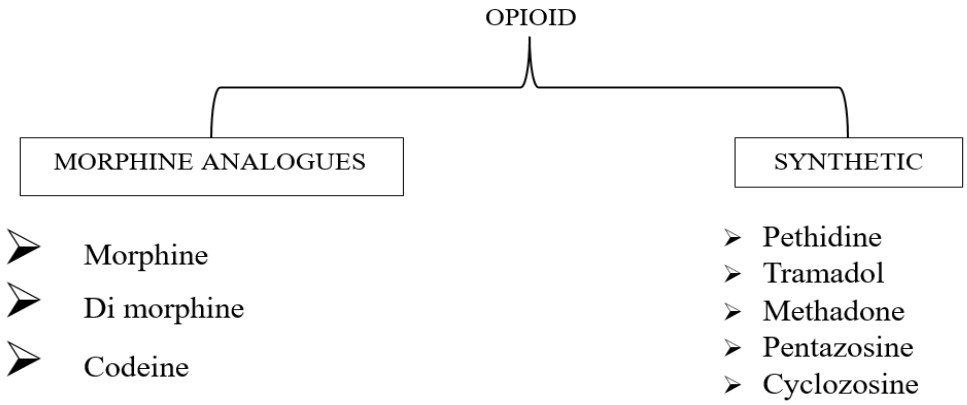
Abstract

Opioids are commonly used for management of pain. The term opioids include compounds that are extracted from the poppy seed as well as semi synthetic and synthetic compounds. Their regular non-medical use, Prolonged use, misuse and the use without medical supervision can lead to opioid dependence and other health related problems. Opiate dependence is the disorder of regulation of opioid use arising from repeated or continuous use of opioids. In worldwide, about 275 million people or {5.5 percentage of global population aged 15 to 64 yrs.} Used drugs At least once in 2019. Among them about 62 million people used opioids. Opioid use can lead to death due to effects of opioids on the part of the brain which regulates breathing. The number of opioid overdoses has increased in recent years in several countries in part due to the increased use of opioids in the management of chronic pain. Males, People of older age and people with low social economic status are at higher risk of opioid overdose than women. In this article we highlighted about various types of opioids, how it causes effects and symptoms for acute poisoning and chronic poisoning and suggested some of the safety measures and treatment guidelines regarding the opioid overdose condition.

Keywords: Opium, Analgesic, acute poisoning, fatal effects, naloxone, chronic poisoning, Respiratory depression, convulsions.

INTRODUCTION

Firstly, the term opioids include compounds that are extracted from the POPPY SEED as well as semi-synthetic and synthetic compounds with similar properties that can interact with opioid receptors in the brain. [1.CAROL STRIKE.et al 2019]



CLINICAL USE

- It is used as analgesic agent.
- Acute pain after surgery. [2. ARKELL, C et al 2018]
- Injury or trauma
- Cancer pain. [3. BARDWELL, G et al 2018]
- Pain arising from diseases
- **Analgesic** [4. V V PILLAY 2013]
- EXAMPLE,
  Fentanyl,
  Morphine. [5. BC CENTER FORDISEASE CONTROL 2017]
- **Cough suppression**: - Codeine, Dextromethorphan. [6. BRUNT, T. M, et al 2011]
- **Anti-diarrhoeal: -** Diphenoxylate, Loperamide.
- **Acute pulmonary edema: -** Morphine
- **Anesthesia: -** Fentanyl [7. CRESSMAN A.M et al 2017]
- **Opioid dependance: -** Methadone

FATAL DOSE [8. DASGUPTA.N et al 2018]

DRUGS	USUAL FATAL DOSE	USUAL THERAPEUTIC DOSE
Morphine	200mg	10 -15mg
Codeine	800mg (7-14mg/kg)	10 – 60mg
Etorphine	0.03 – 0.12mg	-
Heroin	50mg	-
Hydrocodone	100mg	-
Crude opium	500mg	-
Pethidine	1gm	50 – 150mg
Methadone	100mg	5 – 10mg
Pentazosine	300mg	30 – 60mg
Propoxyphene	1gm	100 – 150mg
Diphenoxylate	200mg	10 – 20mg

MECHANISM OF ACTION

It binds to opioid receptors in CNS. It results in diminished transmission and perception of pain impulse. [9. DUBINSKI.K 2018] Morphine produces spinal and supraspinal analgesia by acting on μ kappa receptors. μ Receptor opioids have dependence producing action due to euthoric action. Kappa receptors mediate psychomimetic effects Dysthoria. [10. GEREIN.K 2017]

TOXICOKINETICS

- Generally, these are readily absorbed from the GIT.
- It can be administered by SC and IM or IV injections.

Extent of protein binding is variable depending on the exact nature of opiate. [11. RESEARCH GATE. COM]
EG: Codeine – 7% protein binding
Butrenorthine - 96% protein binding
Morphine – 34% protein binding
The major metabolic pathway of morphine is conjugation with glucuronic acid to produce morphine- 6-glucuronide which is pharmacologically active. [12. KERR, T., & TUPPER, K. 2017]

I. Excretion occurs in urine as morphine-3-glucuronide.
II. Duration of action varies from 2 to 8 hrs.

CLINICAL SYMPTOMS

Acute poisoning:

- coma- respiratory depression [Breathing too slowly or too shallowly] [13. LAVOIE, J. 2017]
- Pin point pupils [May be dilated if hypoxia issevere].
- Bradypnea [Abnormally slow breathing rate][14.ONTARIO MINISTRY OF HEALTH AND LONGTERM CARE 2018]
- Cyanosis [blue hands and feet]
- Non-Cardiogenic pulmonary edema [Acute hypoxia]
- Hypotension [DECREASED BP]
- Hypothermia [Low body temperature]
- Urinary retention [[15. WHO [WORLD HEALTH ORGANISATION]]
- Hyperkalemia [high levels of potassium]
- Convulsions [Involuntary muscle contractions]

Chronic poisoning: -

- Unusual mood swings [16.NEW AND EMERGING OPIOID OVERDOSE et al 22 APRIL 2021]

METABOLISM

Periods of depression alternating with euphoria, Weight loss, Chronic constipation, Sweating. [17. RUDD RA, PAULOZZI LJ et al 2014], Tremors. In addition, an addict may have dermal scars [from IV abuse] and suffers from amnesia, confusion, hallucinations. [18. SEHGAL N et al 2012]

DIAGNOSIS

- CBP – Complete blood picture
- Needle mark & Dermal scars: Addiction
- Evidence of hypoglycemia, [19. DAVIS C, CARR D. 2017]
- Hypothermia and hypoxia.
- Urine analysis

TREATMENT ACUTE POISONING

1)Supportive therapy [20. ABOUK R et al 2019]

a. Maintenance of patient airway.
b. Endotracheal incubation, ventilation.[21. HILTON MT 2018]
c. Maintain adequate ventilation and oxygenation with frequent monitoring of atrial blood gases and pulse oximetry. [22. FRIEDMAN SR et al 2013]
d. Administration of activated charcoal as an aqueous slurry in patience with a potentially toxic injection who are awake and able to protect airway. [23. BCCORONERS SERVICE 2019]. Activated charcoal is most effective when administered within 1hr of ingestion.
2) Naloxone – It is the antidote of choice for opioid poisoning. [24. BARDWELL G, BOYD J et al 2018]
3) The use of physostigmine salicylate (0.04mg/kg IV) has been suggested for reversing respiratory depression**.** However, it is a dangerous antidote which has serious adverse effects.[25. POTIER C, et al 2014]

4) **Convulsions** may be treated with benzodiazepine in usual manner (5 – 10mg initially, repeat every 5 – 10min as needed) though this is frequently not necessary if naloxone is available monitor for respiratory depression[26. WALLEY AY et al 2020]. Hypotension, arrhythmia can be need for endotracheal intubation.
5) Evaluate for hypoxia, electrolyte disturbances, hypoglycemia with IV dextrose 50ml in an adult or 2ml/kg in 25% of dextrose for child. [27. MINOZZI S et al 2013].
6) **For hypotension –** infuse 10 – 20ml/kg of isotonic fluid and place in Trendelenburg position. If hypotension persists administered dopamine (5mcg/kg/min) or nor-adrenaline (0.5-1mcg/min titrate to maintain adequate BP).[28. AKBIK H, et al 2006]

Chronic poisoning:

1. Substitution therapy with methadone began at 30 – 40mg/day and then gradually decreases. [29. ZEDLER BK, et al 2017]
2. A β-blocker like propranolol (80mg) is said to be quite effective in relieving the anxiety and craving associated with opioid addiction**.** [30. ANDERSON K. DEATH AFTERTREATMENT FOR HEROIN DEPENDENCE].. But has no effect on physical symptoms. Alternatively, drugs such as clonidine, buprenorphine or naltrexone can also be used.
3. The regimen suggested is clonidine 0.1mg TID for 7 days followed by naltrexone 50mg BD for 14 days along with gabapentin 600mg BD for 21 days**.** [31. ROCKETT IR, et al 2015]
4. Antispasmodics for abdominal cramps associated with vomiting and diarrhea.
5. Tranquillizers or bed time sedation if necessary. [32. DOWELL D, et al 2016]
6. Psychiatric counselling**.**

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CONCLUSION

In this article we have enlightened about the opioids and various types and mechanism of action and providing information for first aid therapy and antidote for opioid overdose. Nowadays these opiate overdose cases are being raising so we should be aware how to manage overdosing and what prevention should be taken in such conditions. Death following opioid overdose is preventable if the person receives basic life support and the timely administration of the drug naloxone, naloxone is an antidote to opioids that will traverse the effects of an opioid overdose if administered in time.

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