



## ANALGESICS

Drugs that **relives pain** without affecting consciousness.

### Classification:

Analgesics	
<b>Opioids</b> <ul style="list-style-type: none"><li>• Natural opioids</li><li>• Semisynthetic opioids</li><li>• Diacetyl morphine and phenol codiene</li><li>• Synthetic opioids</li></ul>	<b>NSAIDS</b> <ul style="list-style-type: none"><li>• Non-selective CoX inhibitors</li><li>• Selective CoX -2inhibitors</li><li>• Preferential CoX inhibitor</li><li>• Analgesic, Antipyretic</li></ul>

### Pharmacological Actions:

#### I. Analgesic action :

- Relives Musculo-skeleton pain, Dysmenorrhoea and pain associated with inflammation or tissue damage.
- These drugs relive pain without causing Sedation, Drug dependence.
- Aspirin deals with pain after inflammation i.e., both dental ad rheumatic pain.

#### II. Anti-inflammatory action:

- As it inhibits prostaglandin synthesis by inhibiting CoX enzyme synthesis.
- It also modulates increase in cell functions, stabilises lysosomal membrane and inhibition of chemo taxis.
- These days it provides symptomatic relief only.

#### III. Anti- pyretic action:

- It acts by inhibiting the Prostaglandin synthesis which in turn inhibits the formation of pyrogenes in hypothalamus.



- As hypothalamus is the thermal regulatory centre of the body, any variation in the thermostat, decreases the temperature of the body by causing cutaneous vasodilatation and sweating.

#### IV. Anti-platelet action:

- CoX enzyme formed irreversibly in platelet decreases platelet aggregation.

#### V. Acid-base and electrolyte balance:

- Aspirin in low dosage causes respiratory alkalosis which is compensated by excretion of alkaline urine.

#### VI. Action on Gastrointestinal tract (GIT):

- Aspirin – Enters in unionised state → Gets ionised in GIT → Cannot diffuse back → damages gastric mucosa.
- Aspirin → inhibits CoX inhibitor → Synthesis of PGE1 and PGE2 → gastric mucosal damage.

#### VII. Action on Respiration:

- Causes respiratory alkalosis.

#### VIII. Action on Cerebra-Vascular System (CVS):

- Aspirin at large doses → increases the Oxygen consumption → increases the Cardiac output.

#### IX. Action on Urate excretion:

- Decreases the uric acid secretion in distal convoluted tubule → Increasing the plasma uric acid level.
- Avoided in gout patients.

### Therapeutic uses:

- ✚ As Analgesic.
- ✚ As Antipyretic
- ✚ In Osteoarthritis and Rheumatoid arthritis.
- ✚ In Myocardial Infarction and Stroke.
- ✚ Delays labour during pregnancy.
- ✚ Used to treat pregnant hypertensive patients.



## Side effects:

- + Causes Nausea, Vomiting, Hypersensitivity Reactions, Epigastric Distress, Peptic Ulcers.
- + Salicylism :- (**HIVE-D**)
  - i. Hyperventilation
  - ii. Impairment(hearing vision)
  - iii. Vertigo
  - iv. Electrolyte imbalance
  - v. Dizziness
- + Reye's syndrome: Hepatic Encephalopathy.

## NON-STEROIDAL ANTI-INFLAMMATORY DRUGS (NSAID'S)

Note: Aspirin causes irreversible inhibition of CoX enzyme whereas other NSAIS'S cause reversible inhibition of CoX enzyme.

### Contraindication of Aspirin:

- + Should not be used to treat Hypertensive patients, Epigastric distress, Peptic ulcer.
- + Not to be used in children having Reye's Syndrome.
- + In Pregnant women.
- + In Hepatic necrosis.
- + Causes premature closure of ductus arteriosus.

Note: Paracetamol does not affect uric acid levels in our body. So, it is given in patients having Gout.