CNS pharmacology part2

Opioids

Opioid receptors are of three families (μ, κ, and δ)

Morphine is the prototype μ **agonist**

- *Morphine also* acts at κ receptors, decreasing the release of substance P

Actions:

- *Analgesia*; ↑pain threshold and alter perception of pain
- *Euphoria*: powerful sense of well-being, caused by disinhibiton of dopamine-containing neurons.
- *Respiratory depression*: ↓response to carbon dioxide
- *Cough suppression*
- *Miosis*; there is little tolerance to this effect. This is an important diagnostic feature because many other causes of coma/ respiratory depression produce pupil dilation.
- *Emesis*; stimulation of the chemoreceptor trigger zone
- GI: ↓motility. Constipation. ↑biliary tract pressure
- Cardiovascular: minimal, cerebral vessel dilation (caused by ↑pCO_2) → ↑CSF pressure *contraindicated in individuals with head trauma.
- *Urinary retention*

Contraindications and cautions

- *emphysema or cor pulmonale (* severe respiratory depression in those patients)
- *head injury (e*levation of intracranial pressure can be serious in those patients)
- Use with caution in patients with *asthma*, *liver disease or renal dysfunction*

Tolerance:

Tolerance to all drug actions develops except the pupil-constricting and constipating effects.

Cause physical and psychological dependence

Note: in this link https://drive.google.com/open?id=0BwRHXC4PKpePTVpGeF8xNkltUWs there are *very very useful* sketchy pharm videos to watch if you have time.

Other opioids

Receptor action	Drug	Notes
Full agonists	**Morphine**	
	Codiene	-Analgesic: used in combination with acetaminophen for management of pain -antitussive (has been replaced by *dextromethorphan*)
	Oxycodone and oxymorphine	
	Fentanyl	-Rapid onset -used pre and in operations
	Methadone "*Stupid product, heroin without the high*" House, M.D	-used in treatment of opiate and heroin addicts; substitutes for the drug of abuse, and then the patient is slowely weaned from it. -less euphoria - μ receptor agonist and NMDA receptor antagonist -can cause torsades
	Mepridine	-anticholinergic effects -used in obstetrics and in postoperational hypothermia -has an active metabolite (*normeperidine)*that is neurotoxic and can lead seizures -cause serotonin syndrome if administered with SSRIs -containdicated in renal insufficiency
Partial agonist	Buprenorphine	-precepitate withdrawal in users of full agonists -used for the treatment of opioid dependence in combination product with *naloxone*
Mixed agonist antagonist	Pentazocine	-agonist on κ receptors and antagonist at μ receptors -cause spinal analgesia and dysphoria -can precipitate withdrawal in morphine abusers
Antagonists	**Naloxone**	-used to reverse the coma nad respiratory depression of opioid overdose

Other analgesics:

Tramadol

- Also binds μ opioid receptor
- Weakly inhibits the reuptake of norepinephrine and serotonin
- Has been associated with misuse and abuse.