TOPIC: PREMEDICANT DRUGS /PRE MEDICATION

Introduction

Preoperative medication consists of :

- **psychological**
- **pharmacological preparation**.

How the patient should be like before entering OT:

- **free from apprehension**
- **sedated**
- **arousable**
- **cooperative.**

Goals of preoperative medication

- To relieve *anxiety*
- *Sedation*
- *Amnesia*
- *Analgesia*
- *Drying* of airway secretions
- To decrease the chances of aspiration.
- *To produce haemodynamic stability*
- *To prevent PONV.*
- *To control infection.* *Reduction of anesthetic requirements*
- *Facilitation of smooth induction of anesthesia*
- *Prophylaxis against allergic reactions.*

Administration of premedication :

- ***1-2 hr** before the surgery*
- *night before.*

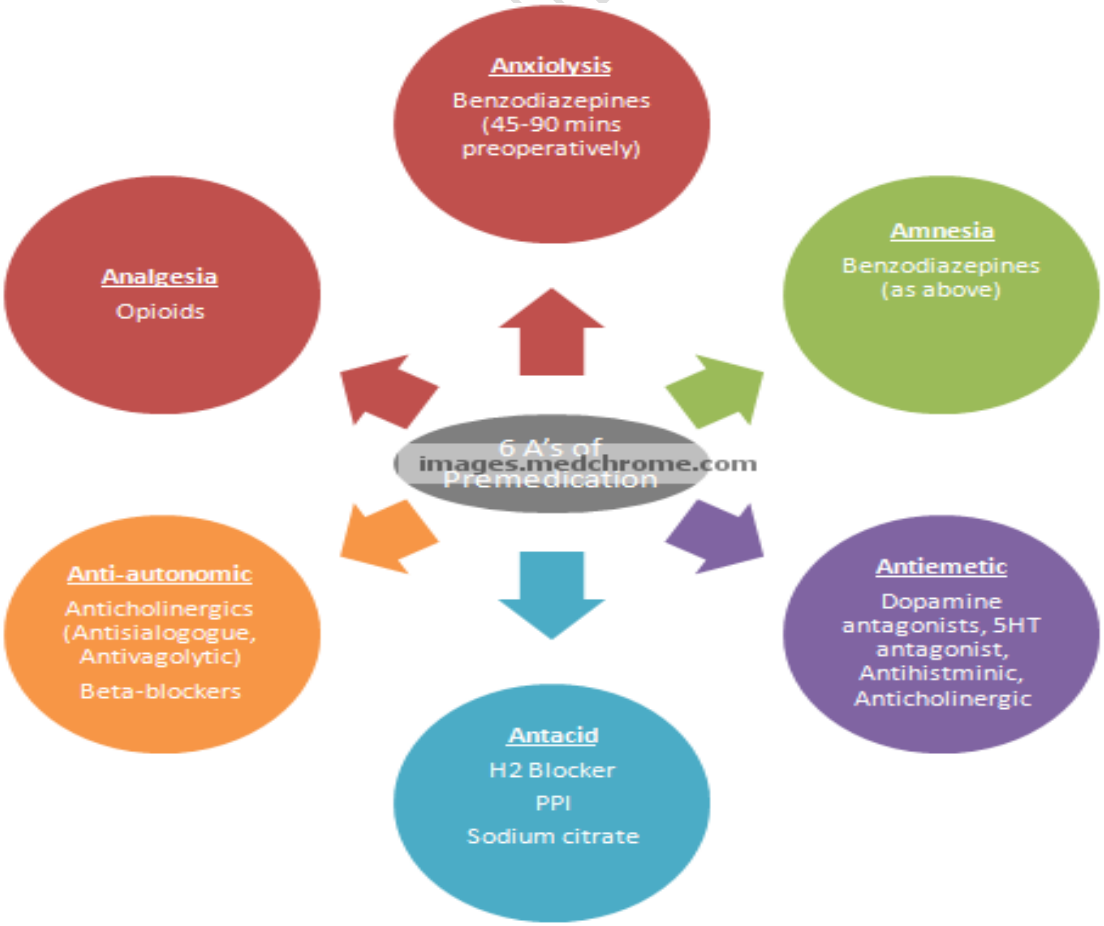
Prescribed medications:

- ☐ ***2 hours prior** to surgery*
- ☐ *small sip of water **(<30 ml)** orally*

Ideal premedicant drug should be:

- ☐ *Anxiolytic*
- ☐ *Analgesic*
- ☐ *Sedative*
- ☐ *Amnesic*
- ☐ *Safe for patient*
- ☐ *Painless and easy to administer*
- ☐ *Highly reliable and specific*
- ☐ *Rapid onset and rapidly cleared*
- ☐ *Free of side effect and interaction with other drugs*
- ☐ *Should not produce undue depression of cardiovascular, respiratory and central nervous system.*

GROUP OF PREANESTHETICS:



I. Anxiolytic / Sedative / Hypnotic:

- ☐ – ***Benzodiazepines*** *(still commonly used)*
- ☐ · *Diazepam*
- ☐ · *Lorazepam*
- ☐ · *Midazolam*
- ☐ · *Alprazolam*
- ☐ – ***Barbiturates*** *(not used much)*
- ☐ · *Secobarbital*
- ☐ · *Pentobarbital*

Benzodiazepines:

- ☐ *Produce **anxiolysis, amnesia and sedation***
- ☐ *Act predominantly on **GABA** (Gamma –Amino butyric acid) receptors in the CNS.*
- ☐ *Minimal respiratory and cardiac depression*
- ☐ *Do not produce nausea and vomiting*
- ☐ *They are **not analgesics***
- ☐ *Crosses placental barrier and may cause neonatal depression*

Diazepam:

- ☐ *Can be used as a sole agent as for cathetrisation, cardioversion, bronchoscopy.*
- ☐ ***Doses** :*

  0.25 to 0.5 mg/kg orally

  0.25 mg/kg IM

  0.3 to 0.6 mg/kg IV as an inducing agent

- ☐ ***Flumazenil**, is effective in reversing the sedative effects*.

Lorazepam:

- ☐ *A new and effective **sedative/amnesic/Anxiolytic***

- *Has stabilising effect on cardiovascular and respiratory systems*
- ***Twice as potent as midazolam.***
- ***Used for lengthy procedures.***
- ***Obesity*** *prolongs the sedative effects of Lorazepam.*
- ***Dose*** *for premedication :*
- *Oral – 50 µg/kg, not more than 4 mg (can be given 90 min before anesthesia)*
- *0.03–0.05 mg/kg IM*
- *Sedation : 0.03–0.04 mg/kg IV*

Midazolam:

- *Water soluble benzodiazepine with painless administration*
- *Amnesic effects are more potent than sedative effects.*
- *choice of drug for out patient surgery and paediatric premedication*
- *Capable of crossing the BBB (Blood Brain Barrier) with effects ranging from tranquillization to full anaesthesia.*
- *Respiratory depressant*
- *Hazardous in hypovolemic patients.*
- *Patients with decreased intracranial compliance show little or* ***no change in ICP*** *with midazolam*
- *Usual* ***dose*** *: 0.15 to 0.3 mg/kg IV*
- ***Lesser*** *dose to be used in* ***elderly and obese patients***
- *0.5 to 0.75 mg/kg orally produces anxiolysis and degree of tranquillity within 30 min*
- ***Pediatric dose :*** *0.1 mg/kg IV or IM*
- *Intranasal midazolam 0.3 mg/kg has quicker onset of action than oral midazolam.*

(NOTE: Thus, midazolam is an acceptable alternative to barbiturates for induction of anesthesia in patients with intracranial pathology.)

II. Opioid analgesics

- *– Morphine*
- *– Pethidine*
- *– Fentanyl*

They differ in duration of action; can be given parentally.

- *administered preoperatively for **sedation***
- ***control hypertension** during tracheal intubation*
- ***analgesia***

*For preoperative analgesia, the use of IV **fentanyl** is preferred :*

- *rapid onset*
- *short duration*

❑ *Fentanyl is also available as transdermal patches.*

Morphine:

☐ *An opium alkaloid and a standard potent addictive analgesic /sedative/Anxiolytic*

☐ *May lead to GI spasm, biliary tract spasm, even renal tract spasm.(avoided in renal and biliary colic)*

☐ *Causes constipation and urinary retention*

☐ *Depresses respiration both in rate and depth*

☐ *Passes through placental barrier (effects foetus and prolongs child birth)*

☐ *1mg of IV morphine ≈ 4 mg of oral morphine*

☐ *Dose : 1.0 – 2.5 mg IV*

☐ *Morphine should be carefully used in :*

- *Extremes of ages*
- *Respiratory problems*
- *Liver and kidney pathology*
- *In patients with increased ICP*
- *Pregnancy*

Fentanyl:

☐ *Potent narcotic analgesic ; **100 times** more potent than morphine*

☐ *Metabolised in liver and excreted through urine and feces*

☐ *Respiratory depression and rigidity of respiratory muscles **which can be satisfactorily treated with naloxone.***

☐ *Less nausea and vomiting*

- ***Cautious*** *use in patients with COPD, head injury and patients on MAO(Monoamine Oxidase Inhibitor) inhibitors.*
- ***Dose*** *: 1-5 µg/kg IV.*

III. Anticholinergic drugs

Three drugs are in use as preanesthetic:

- *– Atropine*
- *– Hyoscine*
- *– Glycopyrrolate*

While the first two crosses the BBB, ***Glycopyrrolate*** *does not cross BBB and is not absorbed from GI tract.*

Doses:

Atropine *0.3 – 0.4mg IV :*

used to treat Bradycardia and to control secreations.

- ***Hyoscine(scopolamine)*** *0.4 mg IV :*

More antisialogogue, *causes sedation and amnesia, so* ***avoided in elderly patients***

- ***Glycopyrrolate*** *(dose 0.1 – 0.3 mg IV) :*

Longer duration of action and less tachycardia

Clinical effects of Anticholinergics:

- ***Antisialogogue effects*** *: Glycopyrrolate and Hyoscine are more potent than atropine, reduce secretions and Bradycardia after succinylcholine.*
- ***Sedative and amnesic effect*** *: In combination with morphine, Hyoscine produces powerful sedative and amnesia effects.*
- ***Prevention of Bradycardia :*** *Atropine is used prevent halothane Bradycardia.*

Comparative effects of Anticholinergics :

Side effects of Anticholinergics:

- ***CNS toxicity:*** *Atropine produces central Anticholinergic syndrome of the CNS, producing restlessness, agitation, somnolence and convulsions.*

Physostigmine *1-2 mg IV reverses the effects when given with Glycopyrrolate*

- *Reduction in lower oesophageal sphincter tone*
- ***Tachycardia & Hyperthermia***

- ☐ ***Mydriasis and cycloplegia****(miotic eye drops should be continued in patients with glaucoma)*
- ☐ *Unpleasant and excessive* ***drying of mouth***
- ☐ *Increased physiological dead space by 20-25%(compensated by increased ventilation)*

IV. Antiemetic

- ☐ *– Ondansetron*
- ☐ *– Metoclopromide – most commonly used*
- ☐ *–* ***Phenothiazines*** *– Promethazine used*

Antihistamines and antiemetics enhance gastric emptying and are used to prevent nausea, vomiting in patients which are the single most common factor delaying recovery in patients.

Additional usage includes:

- *Sedative property*
- *Relieving anxiety*
- *Anti-cholinergic effect*

Ondansetron:

- ❑ *Used for* ***prevention of PONV****(Post-Operative nausea vomiting) in a dose of 4 mg IV*
- ❑ *In children, a dose of 0.1 mg/kg* ***upto 4 mg*** *may be used in vomiting prone children*
- ❑ *Elimination half life is 3.5 to 4 h in adults*
- ❑ *Side effects include headache, constipation, diarrhoea, sedation, a sense of flushing, warmth and so on.*

Metoclopromide:

- ❑ *water soluble antiemetic drug used parenterally, orally and even rectally*
- ❑ ***Dose*** *: 0.15 to 0.3 mg/kg IV, effect lasts for 12h*
- ❑ *Increases the rate of gastric emptying, and causes some increase in peristalsis of gut*
- ❑ *May be used in emergency anaesthesia (for hastening the emptying of stomach)*
- ❑ *Indicated in patients with* ***hiatus hernia, obese, and duodenal ulcer.***
- ❑ ***Acts both centrally and peripherally***
- ❑ ***Central Action:*** *Acting as dopamine antagonist, acts on medullary vomiting center, producing anti-emetic effect.*
- ❑ ***Peripheral Action:*** *Enhances gastric emptying so that gastric components are passed earlier, preventing gastric aspiration.*

NOTE: Atropine should be withheld until induction of anaesthesia as it blocks effects of metoclopromide

V. Prevention of pulmonary aspiration:

- ☐ *No drug or combination is absolutely reliable in preventing the risk of aspiration*
- ☐ *Patients with no apparent risk of aspiration, these drugs are not recommended*
- ☐ ***Cimetidine** and **Ranitidine** are the two drugs in common clinical use which when used as premedication may increase the gastric **pH higher than 2.5** and decrease the **gastric volume < 25 mL***

NOTE: (< 25 ml) which is theoretically desirable to lower the incidence and severity of acid aspiration syndrome.

Factors predisposing to aspiration:

- ☐ *Emergency surgery*
- ☐ *Inadequate anesthesia*
- ☐ *Abdominal pathology*
- ☐ *Obesity*
- ☐ *Opioid premedication*
- ☐ *Lithotomy*
- ☐ *Difficult intubation/airway*
- ☐ *Hiatal hernia*

Summary of fasting recommendations to reduce the risk of pulmonary aspiration:

Ingested material	Minimum fasting period (hrs)
Clear liquids	2 hrs prior to surgery
Breast milk	4 hrs prior to surgery
Infant formula	6 hrs prior to surgery
Non human milk	6 hrs prior to surgery
Light meal (toast and clear liquids)	6 hrs prior to surgery

- ☐ **Reduce the secretion of acid** into the stomach by about 70% by blocking the effect of histamine on receptors in the stomach wall
- ☐ Used for **prevention of acid aspiration syndrome**

Ranitidine seems to be better than cimetidine due to:

- its *longer duration* of action
- its *lower incidences of side effects* and drug interactions

☐ **Doses** : *Cimetidine* – 400 mg (*PO*)

Ranitidine – 150 mg (*PO*), **90 to 150 min** before induction of anesthesia

☐ Also *effective* when given *IV* **45 to 60 min** before induction, but are unable to influence acid already present in the stomach, which depends on gastric emptying

☐ Oral *sodium citrate* **15-30 minutes** before induction can also be used for this purpose

VI. Preoperative Surgical Antibiotic Prophylaxis:

☐ *Antibiotic selection :*

Cephalosporin's (against skin microbes) e.g. ceftriaxone, cefotaxime, clindamycin, metronidazole

Vancomycin (anaerobic and gram-negative microbes)

☐ ***Timing :***

- *1 hour prior to incision*
- *2 hours before incision for Vancomycin*
- *Prior to tourniquet inflation*
- *Redose after two half lives (Cefazolin has half-life of 2 hours so redose if surgical procedure > 4 hours)*

Premedication in paediatric patient:

☐ *Includes **age-specific psychological preparation***

☐ *Topical anaesthetic creams are often prescribed for children before cannulation*

B. Pharmacological preparation for paediatric patient:

Oral premedication is preferred for patients without IV access

1. ***Midazolam** (0.5 – 0.75 mg/kg) in a flavoured oral preparation produces sedation**.** Roohafza, honey etc can be used as effective flavouring agents. Intranasal midazolam has faster onset but causes nasal burning.*

2. ***Paracetamol syrup*** *- 5-10mg/kg*

   10-15mg/kg rectally produces analgesic effects.

3. ***Ketamine*** *(5 – 10 mg /kg) prescribed 20 to 30 min before induction facilitates smooth separation from parents*

4. ***Opioid:*** *in the absence of an IV catheter, transmucosal administration of fentanyl (lollipop) is effective in producing sedation.*

Pre op Medication instruction guideline :

Medication to be continued on day of Surgery:

Anti hypertensive

- ☐ Diuretics
- ☐ Cardiac medication
- ☐ Antidepressant – anti anxiety
- ☐ Thyroid, asthma medication

NOTE; Patients on alcohol dependence should receive diazepam group of drugs to prevent withdrawal symptoms

(Withdrawal diuretics) -> Hypervolemia, pulmonary oedema, cardiac failure. Continue steroid therapy for pts at risk of adrenal suppression

Medications to be discontinued before surgery:

- ☐ Aspirin : * 7 days before surgery
- ☐ NSAIDs : * 48 hrs before plastic retinal surgery
- ☐ Oral hypoglycaemic drugs : * on the day of surgery
- ☐ Insulin : * 1/3rd dose in morning
- ☐ Warfarin : * 4 days before surgery
- ☐ Heparin : * 4 – 6 hrs before surgery
- ☐ MAO inhibitors : * 2 weeks before surgery

(MAO inhibitors produce severe interaction with sedatives, hypnotics, narcotic analgesics and anesthetics , so, discontinue to bring MAO level in the brain normal at that time. Insulin -> include glucose to provide energy, to include insulin to provide catabolism and reduce customary dose in the morning to decrease the risk of hypoglycaemia