Lecture title: CNS Drugs

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B. Injectable Anesthetics

Advantages of Injectable anesthesia:

1. Minimal apparatus used.

2. Ease of induction.

3. Useful in head surgery.

4. Diminish the side effects of anesthetic in case of respiratory diseases, debility and shock.

Disadvantages of Injectable anesthesia:

1. The depth and the level of anesthesia cannot easily controlled.

2. Ease of occurrence of anesthetics overdose.

I. Barbiturates anesthetics

II. Non-barbiturates anesthetics

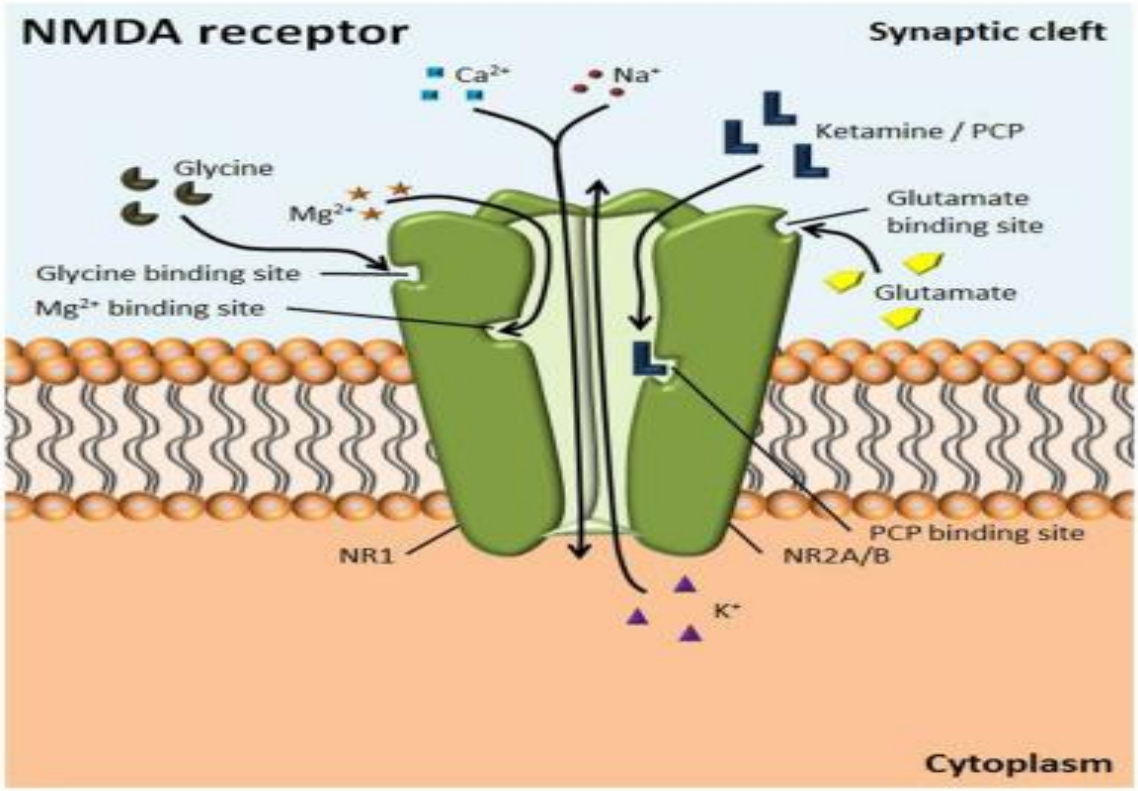
Ketamine

Mechanism of action:

Antagonizes aspartate receptors (N-methyl-D-aspartate (NMDA) receptors) leading to depression of the brain.

It is given I.M., I.V. and S.C. It produces stage I and II anesthesia with weak muscle relaxation therefore, it is usually combined with α_2 receptor agonists like xylazine, meditomidine and detomidine.

The analgesia is good and body reflexes like swallowing are maintained during ketamine anesthesia.



Contraindications:

1. Abdominal surgery.

2. Caesarian section (CS).

3. Liver and kidney diseases.

4. Head injuries because ketamine increases the pressure of cerebrospinal fluid (CSF).

Propofol

Mechanism of action:

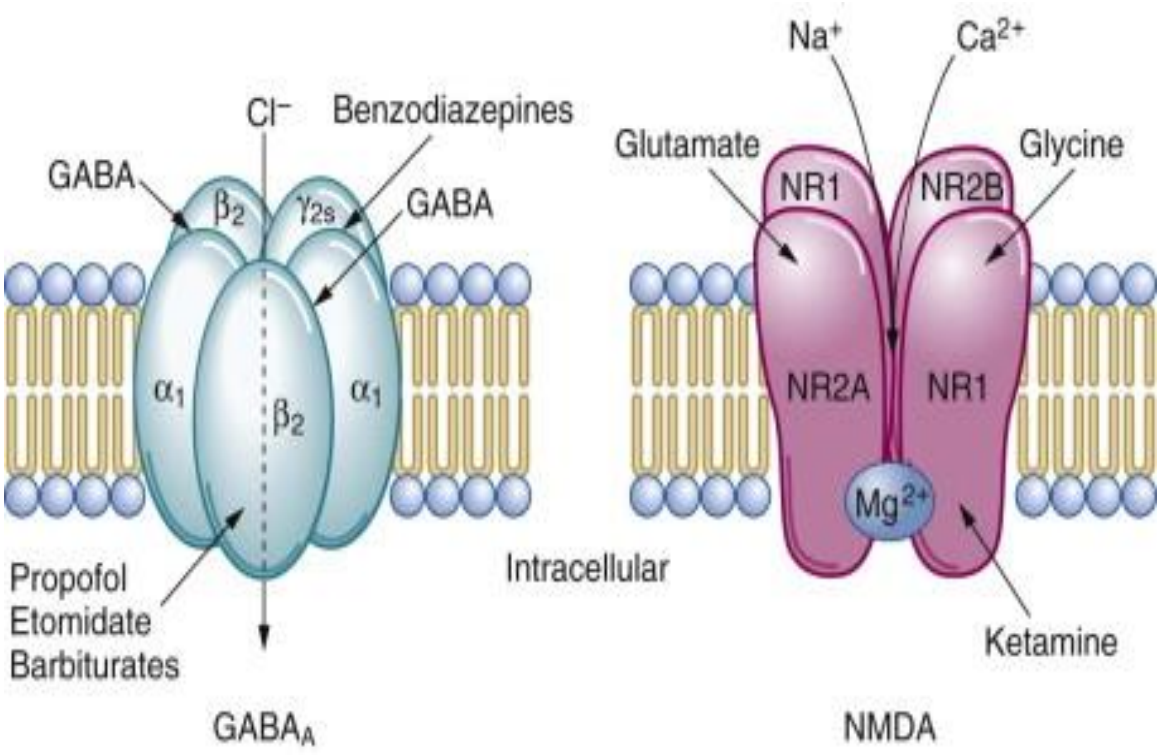
Potentiate the effect of GABA neurotransmitter leading to inhibition of the brain. It is usually used in dogs and cats and has rapid onset of action and short duration of anesthesia about 15-30 minutes. It produces good muscle relaxation but vomiting and hypotension may occur.

Etomidate

Mechanism of action:

Increases the effect of GABA neurotransmitter leading to inhibition of the brain. It is short acting I.V. anesthetic agent and has short duration about 3-5 minutes. It decreased corticosteroids production by suppression of the adrenal gland.

Chloralhydrate



2. Local Anesthetics

Mechanism of action of local anesthetics:

Local anesthetics prevents the local pain by blocking the sodium channel and reversibly prevent the depolarization of the nervous tissue.

It is injected at the site of action and it is called nerve block when it is injected around or close to peripheral nerve or nerve plexuses.

It is called epidural anesthesia when injected into the spinal cord spaces and do not interfere with the vital or local functions of the body.

The absorption of local anesthetics can be delayed by giving epinephrine which causes vasoconstriction that prolonged the duration of anesthetic action.

Types of Local Anesthetics:

1. Esters: e.g. Procaine and Tetracaine.

2. Amides: e.g. Lidocaine and Etidocaine.

Side effects:

1. Hypotension.

2. Urinary retention.

3. Difficulties with motor muscles.

4. Nausea and vomiting.

5. Seizure.

Clinical uses:

1. Relief of local pain.

2. Tail amputation in animals.

3. Insect bites.

4. Minor burns.

5. Local itching.

Local anesthesia induced physically

Ethyl chloride: is volatile liquid stored under pressure and released as a spray, it cools the skin and cause local anesthesia.

CO_2 ice: used to cauterize warts and induced local anesthesia.