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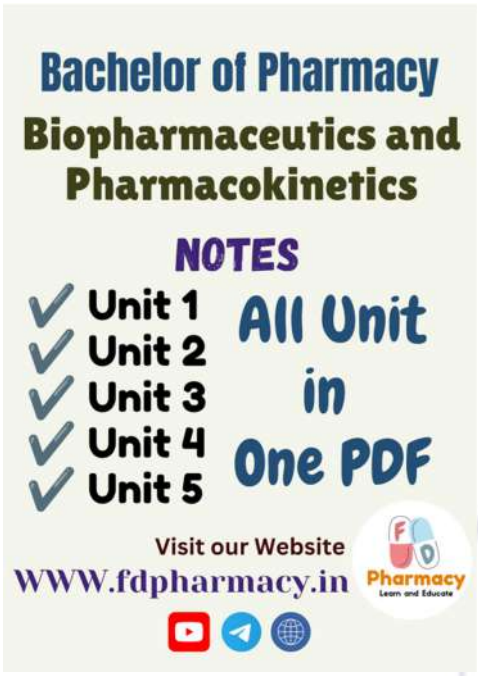
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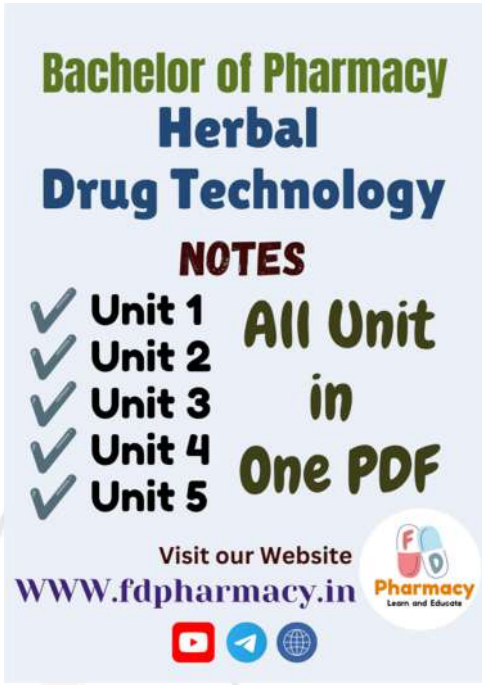
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PHARMACOLOGY - III

UNIT 1

TOPIC :

- e. Respiratory stimulants

Respiratory Stimulants

→ Respiratory stimulants are drugs that stimulate the respiratory center in the brain or improve the activity of respiratory muscles, thereby increasing the rate and depth of breathing.

→ They are mainly used in conditions where respiration becomes slow or depressed.

Uses of Respiratory Stimulants

- Respiratory depression due to drugs
- Neonatal apnea
- Chronic obstructive pulmonary disease (COPD)
- Post-anesthetic respiratory depression
- Sleep apnea
- Carbon dioxide retention states

Classification of Respiratory Stimulants

1. Central Respiratory Stimulants

- These drugs stimulate the respiratory center in the medulla.

Examples:

- Doxapram
- Nikethamide
- Pentylenetetrazol

2. Methylxanthines

- These stimulate respiration and relax bronchial smooth muscles.

Examples:

- Caffeine
- Theophylline
- Aminophylline

3. Respiratory Stimulants Used in Neonates

Examples:

- Caffeine citrate
- Theophylline

Mechanism of Action

Drug/Class	Mechanism of Action	Uses
Doxapram	Stimulates respiratory center and carotid body chemoreceptors	Drug-induced respiratory depression
Caffeine	CNS stimulant; increases sensitivity to CO_2	Neonatal apnea
Theophylline	Relaxes bronchial muscles and stimulates respiration	COPD, asthma
Aminophylline	Improves diaphragmatic contraction and respiration	Asthma, respiratory distress

Important Drugs

1. Doxapram

Mechanism

- Stimulates respiratory center in medulla and peripheral chemoreceptors.

Uses

- Post-anesthetic respiratory depression
- Drug overdose respiratory depression

Adverse Effects

- Hypertension
- Restlessness
- Sweating
- Convulsions (high dose)

2. Caffeine Citrate

Mechanism

- Stimulates CNS and respiratory center.

Uses

- Apnea in premature infants

Adverse Effects

- Irritability
- Tachycardia

3. Theophylline

Mechanism

- Inhibits phosphodiesterase → increases cAMP → bronchodilation and respiratory stimulation.

Uses

- Asthma
- COPD
- Apnea

Adverse Effects

- Nausea
- Palpitations
- Tremors
- Insomnia

Signs of Respiratory Depression

- Slow breathing
- Shallow respiration
- Cyanosis
- Confusion
- Low oxygen level

Precautions

- Use carefully in heart disease patients
- Monitor respiratory rate regularly
- Avoid overdose due to risk of seizures
- Dose adjustment needed in liver disease

Advantages

- Improve breathing
- Increase oxygen supply
- Useful in emergency respiratory depression

Disadvantages

- CNS stimulation
- Risk of convulsions
- Cardiac side effects