Chapter-11
Pharmacology & Toxicology

D.Pharma 2nd Year Notes

Chapter- 11

Autacoids

- **Physiological role of Histamine, 5 HT and Prostaglandins**
- **Classification, clinical uses and adverse effects of antihistamines and 5 HT antagonists**

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Autacoids:

- Autacoids are substances produced by the body that have local effects and can act as regulatory or mediatory agents.
- They are released from cells into the extracellular fluid and are involved in various physiological and pathological processes.
- It also known as Local Hormone.

There are three main types of autacoids:

- **Prostaglandins:** Hormone-like compounds that play a role in inflammation, pain, and regulation of blood flow.
- **Leukotrienes:** Potent pro-inflammatory mediators that play a role in allergic reactions and asthma.
- **Histamine:** A neurotransmitter involved in the regulation of gastric acid secretion, bronchoconstriction, and allergic reactions.

Histamine –

- A **chemical found in some of the body's cells** - causes many of the symptoms of allergies, such as a runny nose or sneezing. When a person is allergic to a particular substance, such as a food or dust, the immune system mistakenly believes that this usually harmless substance is actually harmful to the body.

Physiological role of Histamine:

Histamine is a neurotransmitter that plays a critical role in many physiological processes in the body. Some of the key physiological functions of histamine include:

1. **Gastric Acid Secretion:** Histamine acts on the parietal cells in the stomach to stimulate the release of gastric acid, which is necessary for the digestion of food.
2. **Bronchoconstriction:** Histamine can cause the bronchial smooth muscles to contract, leading to bronchoconstriction. This is a key mechanism in asthma and other respiratory conditions.

3. **Allergic Reactions:** Histamine is released by mast cells in response to allergens and is a key mediator in the development of allergic symptoms such as itching, redness, and swelling.
4. **Vasodilation:** Histamine can cause the blood vessels to dilate, increasing blood flow and promoting tissue perfusion.
5. **Wakefulness and Alertness:** Histamine is involved in the regulation of wakefulness and alertness, and may play a role in attention and memory.

Antihistamines:

- Antihistamines are drugs that block the effects of histamine, a chemical released in the body during an allergic reaction.
- They are used to treat symptoms such as itching, runny nose, watery eyes, and sneezing caused by allergies, hay fever, and the common cold. Some common examples of antihistamines include diphenhydramine (Benadryl), loratadine (Claritin), and cetirizine (Zyrtec).
- Antihistamines are available over-the-counter and by prescription and can cause drowsiness in some people.

Classification:

- Amine derived: Histamine (amino acid: Histidine), Serotonin (Tryptophan)
- Peptide derived: Angiotensin, Bradykinin
- Lipid derived: Prostaglandins, Leukotrienes, Interleukins, Platelet Activating Factor, etc.

Clinical uses of antihistamines

Antihistamines are primarily used for the treatment of allergies and allergic symptoms, including:

- **Hay fever:** relief of symptoms such as sneezing, runny nose, and itchy eyes
- **Hives:** relief of skin itching and redness
- **Allergic conjunctivitis:** relief of eye symptoms such as redness, itching, and tearing

- **Allergic rhinitis:** relief of nasal symptoms such as stuffy nose and sneezing.
- **Anaphylaxis:** emergency treatment of severe allergic reactions
- **Nausea and vomiting** caused by motion sickness
- **Insomnia:** some antihistamines have sedative effects and are used as sleep aids

Adverse Effect:

- Drowsiness
- Dry mouth
- Blurred vision
- Constipation
- Urinary retention
- Confusion and dizziness
- Headache

5-HT (5-hydroxytryptamine) antagonists:

- 5-HT (5-hydroxytryptamine) antagonists, also known as serotonin receptor antagonists, are a group of drugs that block the actions of the neurotransmitter serotonin.
- It is also belongs to an autacoids which release in our body mainly found GIT, platelets and CNS.
- It is derived from an amino acid and

They are used for a variety of medical conditions, including:

1. **Migraines:** 5-HT antagonists are used to prevent and treat migraines.
2. **Depression:** 5-HT antagonists are sometimes used as adjunctive treatment for depression, particularly for patients who do not respond well to other antidepressants.
3. **Anxiety disorders:** 5-HT antagonists are used to treat anxiety disorders, including social anxiety disorder and obsessive-compulsive disorder.
4. **Nausea and vomiting:** 5-HT antagonists are used to prevent and treat nausea and vomiting caused by various conditions, including chemotherapy, surgery, and radiation therapy.

5. **Irritable bowel syndrome (IBS):** 5-HT antagonists are used to treat symptoms of IBS, including abdominal pain and diarrhea.

Physiological role of 5 HT:

5-Hydroxytryptamine (5-HT), also known as serotonin, is a neurotransmitter that plays a key role in many physiological processes in the body.

Some of the key physiological functions of 5-HT include:

1. **Mood regulation:** Serotonin is involved in regulating mood, and low levels of serotonin are associated with depression.
2. **Appetite regulation:** Serotonin plays a role in regulating appetite and is involved in the regulation of food intake.
3. **Sleep regulation:** Serotonin is involved in the regulation of sleep, with higher levels of serotonin promoting sleep and lower levels promoting wakefulness.
4. **Nociception:** Serotonin is involved in the perception of pain and is thought to play a role in the management of chronic pain.
5. **Cardiovascular regulation:** Serotonin has a role in regulating blood flow and is involved in the regulation of blood pressure.
6. **Sexual behavior:** Serotonin is involved in regulating sexual behavior, with higher levels of serotonin leading to decreased sexual desire and lower levels leading to increased sexual desire.

Adverse effects associated with 5-HT antagonists can include:

1. Nausea and vomiting
2. Dizziness and drowsiness
3. Headache
4. Sexual dysfunction
5. Dry mouth
6. Constipation

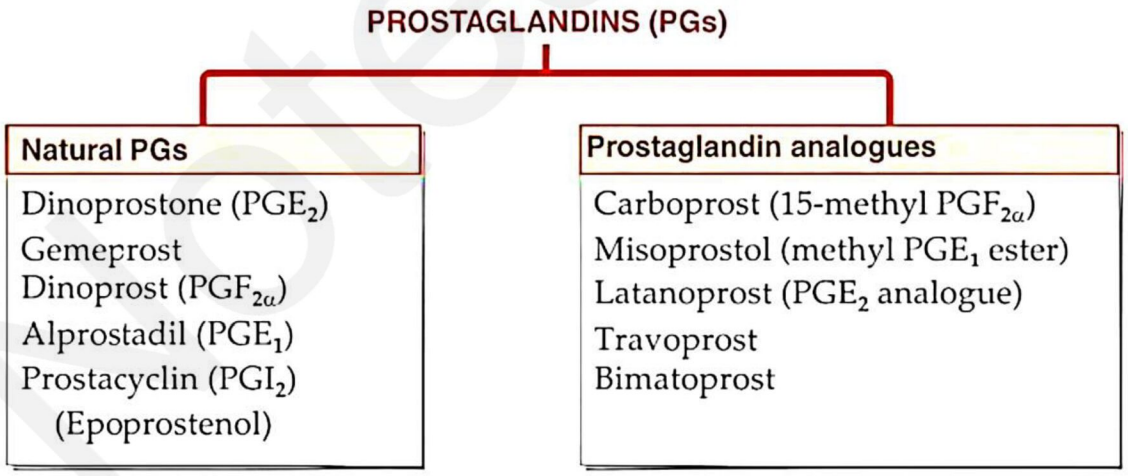
Prostaglandins

- Prostaglandins are a group of naturally occurring lipids that play important roles in various physiological processes.
- They are derived from the essential fatty acid arachidonic acid and are produced by many tissues in the body, including the lining of the stomach, blood vessels, and reproductive tract.

Some of the main functions of prostaglandins include:

1. Regulating blood flow and blood pressure
2. Controlling the contraction and relaxation of smooth muscle in the digestive tract and reproductive system
3. Regulating the production of mucus and bicarbonate in the gastrointestinal tract
4. Mediating pain and inflammation
5. Regulating the body's response to injury and infection.

Classification of Prostaglandins:



Physiological role of Prostaglandins:

Prostaglandins are hormone-like substances that are produced by the body and have local effects on various tissues. Some of the key physiological functions of prostaglandins include:

1. **Pain and Inflammation:** Prostaglandins play a crucial role in the regulation of pain and inflammation. They are involved in the production of pain and the development of inflammation in response to injury or infection.
2. **Regulation of Blood Flow:** Prostaglandins are involved in regulating blood flow, particularly in the blood vessels of the kidney and heart. They help to regulate blood pressure and prevent blood clots from forming.
3. **Protection of the Stomach:** Prostaglandins play a role in protecting the lining of the stomach from damage caused by stomach acid and other irritants.
4. **Regulation of Labor:** Prostaglandins are involved in the regulation of labor and delivery in pregnancy, causing the uterus to contract and helping to initiate labor.
5. **Fertility:** Prostaglandins are involved in the regulation of fertility and are necessary for the release of eggs from the ovaries and for the preparation of the uterus for pregnancy.