SNS COLLEGE OF ALLIED HEALTH SCIENCES

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Affiliated to Dr MGR Medical University, Chennai

DEPARTMENT : OPERATION THEATRE AND ANAESTHESIA TECHNOLOGY

COURSE NAME : PHARMACOLOGY

UNIT : ANTICOAGULANTS

TOPICS : DEFINITION, VITAMIN K ANTAGONISTS, DIRECT ORAL ANTICOAGULANTS, HEPARINS, OTHER ANTICOAGULANTS,

ANTICOAGULANTS

- Anticoagulants are drugs that inhibit the formation or extension of blood clots.

- They are commonly used in various clinical conditions to prevent or treat thromboembolic disorders. Anticoagulants work by interfering with different stages of the blood clotting process.

VITAMIN K ANTAGONISTS

Examples: Warfarin

Mechanism of Action:

- Inhibits the synthesis of vitamin K-dependent clotting factors (II, VII, IX, X) in the liver.

Pharmacodynamics:

- Warfarin prevents the carboxylation of clotting factors, decreasing their activity.

Pharmacokinetics:

- Well-absorbed orally, undergoes hepatic metabolism, and has a relatively long half-life.

Indications:

- Prevention and treatment of venous and arterial thrombosis, atrial fibrillation, and prosthetic heart valves.

Monitoring:

- International Normalized Ratio (INR) is regularly monitored to adjust dosage.

Contraindications:

- Pregnancy, liver disease, bleeding disorders.

DIRECT ORAL ANTICOAGULANTS(DOACs)

Direct Thrombin Inhibitors:

Examples: Dabigatran

Mechanism of Action:

- Inhibits thrombin directly.

Indications:

- Stroke prevention in atrial fibrillation, treatment and prevention of venous thromboembolism.

Monitoring:

- No routine monitoring; assess renal function.

Contraindications:

- Renal impairment.

Factor Xa Inhibitors:

Examples: Apixaban, Rivaroxaban, Edoxaban

Mechanism of Action:

- Inhibit factor Xa, a key factor in the coagulation cascade.

Indications:

- Prevention and treatment of venous thromboembolism, stroke prevention in atrial fibrillation.

Monitoring:

- No routine monitoring; assess renal function.

Contraindications:

- Severe renal impairment, pregnancy.

HEPARINS

Unfractionated Heparin (UFH):

Mechanism of Action:

- Enhances antithrombin III activity, inhibiting thrombin and factor Xa.

Indications:

- Immediate anticoagulation in acute situations (e.g., pulmonary embolism, deep vein thrombosis).

Monitoring: Activated Partial Thromboplastin Time (aPTT) is monitored to adjust dosage.

Low Molecular Weight Heparins (LMWH):

Examples: Enoxaparin, Dalteparin

Mechanism of Action:

- Selectively inhibits factor Xa.

Indications:

- Prophylaxis and treatment of venous thromboembolism, acute coronary syndromes.

Monitoring: Generally not required.

Fondaparinux:

Mechanism of Action:

- Selectively inhibits factor Xa.

Indications:

- Prophylaxis and treatment of venous thromboembolism.

Monitoring:

- Generally not required.

OTHER ANTICOAGULANTS

Direct Factor Xa Inhibitors:

- Examples: Betrixaban, Andexanet alfa (reversal agent for factor Xa inhibitors).

Vitamin K Antagonist Reversal Agent:

- Example: Vitamin K (reverses the effects of warfarin).

TECHNICIAN ROLE

- Monitoring: Regular monitoring of coagulation parameters is necessary for certain anticoagulants (e.g., INR for warfarin, aPTT for UFH).

- Dosing Adjustments: Individualized dosing is essential, and adjustments are often needed based on monitoring results and patient characteristics.

- Reversal Agents: Some anticoagulants have specific reversal agents (e.g., vitamin K for warfarin, idarucizumab for dabigatran, andexanet alfa for factor Xa inhibitors) in case of bleeding or urgent procedures.
- Renal Function: Assessing renal function is crucial for drugs excreted through the kidneys (e.g., DOACs).
- Patient Education: Educating patients on signs of bleeding, the importance of medication adherence, and interactions with other medications.

ASSESSMENT

- What is Anticoagulants ?
- What is Heparins ?