Pharmacology

Clinical applications on NSAIDs

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Objectives

 By the end of this lecture the student should :

 Know the main clinical problems encountered with NSAIDs
 Explain the causes and find solutions for them.

Case 1

1-An 8 year old girl has fever and muscle aches from viral infection.

A-Which one of the following drugs would be the most appropriate to treat her symptoms?

a-Acetaminophen

b-Aspirin.

c-Celecoxib.

B-Why are you don't choose the other drugs?

-Aspirin should be avoided in children because of association with Reyes syndrome.

-Celacoxib is indicated mainly for alleviation of pain.

Reye's syndrome (RS) is rare disorder that affects all organs of the body but is most harmful to the brain and the liver—causing an acute increase of pressure within the brain and, often, massive accumulations of fat in the liver and other organs.

The cause of RS is unknown. Studies have shown a link between aspirin (salicylate) and the onset of Reye's syndrome. Because of this association, healthcare professionals do not recommend the use of aspirin for children.

Case 2

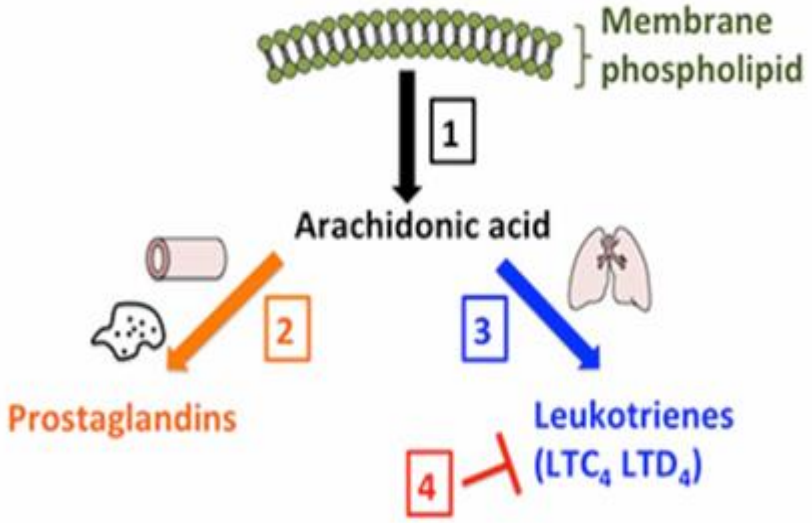
NSAIDs such as aspirin can produce a type of allergic response in some patients. Which step, if blocked, is responsible for causing this drug allergy?

A- Step 1

B- Step 2

C- Step 3

D- Step 4



Case 3

A patient with history of DVT on warfarin treatment developed bleeding per rectum after few days treatment with indomethacin?

1- what are the possible cause?

Drug interaction because warfarin is anticoagulant and indomethacin affects platelets action and displaces warfarin from protein binding sites.

2- what are the other possible complaints may appear?

Gastric pain- neuropathy- analgesic nephropathy.

Case 4

Hypertensive patient on captopril treatment presented to rheumatologist with joint pain and swelling with fever , ibuprofen was prescribed for him as small dose for few days, the patient continues taking it for longer time by his own? What are the expected outcomes? Explain

Answer

Impaired renal function presented as reduced urine output, nausea, vomiting, proteinuria elevated blood urea and serum creatinine and electrolytes disturbances. Due to concomitant use of NSAIDS with ACE inhibitor (captopril).

Case 5

A 45-year-old female is scheduled for an elective laparoscopic cholecystectomy. During the pre-operative assessment, she mentions she takes Celecoxib 200 mg daily for rheumatoid arthritis. She has no other significant medical history. What is your decision for this case?

Answer

Surgical operation should be postponed for 7- 10 days, because aspirin binds irreversible with thromboxane A2 so it is commonly discontinued 7- 10 days prior to surgery to regenerate a new platelet to avoid bleeding.

Case 6

An 18-year-old female is brought to the Emergency Department by her friends. They found an empty bottle of aspirin (500 mg tablets, 30-count) in her room. She admits to taking "a whole bunch" about 4 hours ago in a suicide attempt. What is the effect of mild and high toxic dose of aspirin on acid base balance and how can you treat it?

Answer

Mild toxic dose of aspirin

1- Mild toxic dose of aspirin leading to increasing excretion of $NaHCO_3$ → Metabolic acidosis

2-The body tends to correct the metabolic acidosis through activation of respiratory center →

washing of Co_2 (hyperventilation) → Respiratory alkalosis

high toxic dose of aspirin

1- metabolic acidosis due to excretion of $NaHCO_3$

2- no correction occurs due to inhibition of respiratory center → Retention of CO_2

→ Respiratory acidosis

Death due to both metabolic and respiratory acidosis

Case 7

A 70-year old man has a history of ulcer disease. he has recently experienced swelling and pain in the joints of his hand. his physician wants to begin therapy with NSAIDS .

A-Is that possible?

A-yes, it is possible because NSAIDS have analgesic and anti-inflammatory action through inhibition of COX enzyme this leading to inhibition of PGs.

B-What is the effect of these drugs on Git?

Gastric pain- peptic ulcer due to inhibition of PGE1, PGE2 and PGI2

C-How to overcome these side effects.

Misoprostol is a prostaglandin analog that can reduce gastric acid and pepsin secretion and promote the formation of mucus in the stomach. It is indicated for the purpose of decreasing the risk of ulcer activation in patients taking NSAIDS.

Case 8

A 64-year-old man presents with mild to moderate musculoskeletal back pain. He states that he has tried acetaminophen without relief. His medical history includes diabetes, hypertension, hyperlipidemia, gastric ulcer (resolved), and coronary artery disease.

Which is the most appropriate NSAID regimen to treat this patient's pain?

A. Celecoxib
B. Indomethacin and omeprazole
C. Naproxen and omeprazole
D. Naproxen

Case 9

John is a 63 year old alcoholic with a 5 year history of ulcers. Recently when self-medicating for a back condition John consumed 5 times the recommended daily dose of an over-the-counter pain reliever. Soon afterwards John developed a severe episode of nausea and vomiting. Twelve hours later his wife brings him to the local Emergency Department. After quizzing John about the identity of his analgesic, the ER physician draws blood samples for drug analysis and administers *N*-acetyl cysteine 140 mg/kg orally to prevent further toxicity. What analgesic did John most likely take to cause this problem?

a. Acetaminophen
b. Aspirin
c. Ibuprofen
d. Naproxen

Case 10

Among NSAIDS , aspirin is unique because it:

a. Irreversibly inhibits it’s target enzyme

b. Prevent gouty arthritis

c. Reduce fever

d. Reduce risk of colon cancer

Case 11

A 16-year old boy comes in emergency with aspirin overdose ,which are the most likely symptoms:

a. Bone marrow suppression ,aplastic anemia

b- Fever, hepatic failure.

c. Hyperthermia, metabolic acidosis and coma

d. Fulminant hepatic failure

Case 12

A 9 weeks pregnant lady presented with back and bone ache , what do u prefer for her, Aspirin or paracetamol and why?

Aspirin usually is not recommended during pregnancy unless you have certain medical conditions. Sometimes, health care providers advise pregnant people to take a low dose of aspirin if they have blood clotting disorders.

A low dose of aspirin is about 60 to 100 mg a day.