

## Lesson 9: Adverse reactions (1)

# Aims

- Learning the following topics about adverse reactions of iodinated contrast agents:
- Serious adverse reactions
- Effect of administration route
- Localized reactions
- Systemic reactions

# Adverse reactions

- Most adverse reactions following exposure to iodinated contrast agents are .....
- mild to moderate.

# Adverse reactions

- HOCCM induce mild adverse reactions with a frequency of >10%.
- Mild adverse reactions:
  - Nausea
  - Vomiting
  - Injection pain

# Adverse reactions

- More severe reactions occur infrequently (<2%).
- Severe reactions:
  - Bronchospasm
  - Edema
  - Hypotensive shock
  - Renal dysfunction

# Serious adverse reactions

- Most serious and fatal reactions occur .....
- immediately or within 20 minutes (especially 1 to 3 minutes) after the start of injection.

## Serious adverse reactions

- Serious adverse reactions have been related to:
  - The drugs' high osmolality
  - The drugs' ability to bind calcium
- Serious adverse reactions in radiographic procedures occur more often during ..... than during other procedures.
- ..... angiocardiology

# Diatrizoate compounds (Sodium salts)

- The sodium salts are associated with a higher degree of toxic effects especially for patients with .....
- ..... cardiac, hepatic, or renal disease.
- When the sodium concentration increases →
- Peripheral vasodilation and other side effects increase



# Diatrizoate compounds (Meglumine salt)

- The meglumine salt is less toxic
- The problem:
- High viscosity
- Solution:
- The sodium salt and the meglumine salt, are often mixed to reach a compromise between toxicity and viscosity.

# Effect of administration route

- The route of administration influences .....
- the risk of adverse reactions.

## Adverse effects of oral/rectal route

- Adverse effects associated with oral/rectal administration are limited because .....
- gastrointestinal absorption is very poor.
- Adverse reactions:
- Transient diarrhea
- Abdominal cramping
- Especially when using:
- Large volumes of contrast agent
- High concentrations of contrast agent

# Injection into a joint

- Injection into a joint for arthrography is commonly associated with .....
- transient pain and swelling.
- Severe pain is due to .....
- the procedure rather than from exposure to the contrast agent.

# The intravascular route

- The intravascular route is associated with more serious adverse events.
- The intravascular route reactions:
  - Localized reactions
  - Systemic reactions

# Localized reactions

- Minor pain
- A sensation of warmth due to .....
- vasodilation
- Thrombophlebitis

# Systemic reactions

- Mild
- Severe

# Systemic reactions

- Neurological effects:
  - Headache
  - Vertigo
  - Vision disturbances
- More severe neurological reactions are seen with ..... procedures.
- cerebral arteriography



# Systemic reactions

- Cardiovascular adverse effects:
- Angina
- Hypotension
- Arrhythmias

# Cardiovascular adverse effects

- The effects of contrast agents on **calcium ions may play a larger role than osmolality in cardiac adverse effects** due to .....
- the ability of ionic contrast agents to reduce the availability of extracellular calcium to the myocardium.
- Calcium decreases →
- Adverse cardiovascular effects

# Kidney's damage

- The osmotic effect can cause the arteries of the kidneys to expand →
- Vasoconstrictors are released to compensate for the artery expansion →
- A rapid opening and closing action of the arteries →
- A diminished blood supply to kidneys →
- Total shut down of the kidneys

# Respiratory effects

- Mild symptoms:
- Coughing
- Laryngitis
- Rhinitis
- Severe symptoms:
- Bronchospasm
- Dyspnea
- Pulmonary edema

# Pulmonary edema

- The body must attempt to regulate the fluid overload in the vascular system. If the kidneys are non-functional, fluid overload to occur in other body systems.
- One of the major results of this event is pulmonary edema.

# Summary

- Serious adverse reactions
- Effect of administration route
- Localized reactions
- Systemic reactions