

## **<sup>99m</sup>Tc bisphosphonates**

<sup>99m</sup>Tc oxidronate (HDP<sup>®</sup>, Osteocis<sup>®</sup>)

<sup>99m</sup>Tc medronate (MDP<sup>®</sup>)

<sup>99m</sup>Tc butedronate (Teceos<sup>®</sup>)

### **1. Indications**

Bone scintigraphy, where it delineates areas of altered osteogenesis.

### **2. Preparation**

Approved product, see summary of product characteristics (SmPC)

### **3. Quality control**

The drug product complies with the European Pharmacopeia (PhEur) monograph for Technetium (<sup>99m</sup>Tc) medronate injection.

### **4. Interactions**

#### *Bisphosphonates*

Alendronic acid, ibrandonic acid, pamidronic acid, zoledronic acid: no action

Clodronic acid, etidronic acid: stop 2 weeks before scintigraphy.

#### *Tetracyclin*

Stop at least 2 h before scintigraphy.

#### *Iron-containing medication*

An increased extraossal accumulation of the radioisotope was reported for iron-containing ingredients.

#### *Aluminium containing drugs*

Notably antacids (Maalox<sup>®</sup>, Algeldraat, Regla pH<sup>®</sup>) may lead to abnormally high accumulation of <sup>99m</sup>Tc in the liver, presumably caused by the formation of labeled colloids.

### **5. Adverse reactions**

- Anaphylactoid reactions were reported with a wide array of symptoms ranging from mild skin reactions to anaphylactic shock, which however was only reported in isolated cases.
- Vegetative reactions (nervous system and gastrointestinal disorders). Single cases of severe vegetative reactions like circulatory collapse or syncope have been reported, however, most of the reported vegetative effects include gastrointestinal reactions like nausea or vomiting. Other reports include vasovagal reactions like headache or dizziness.
- Injection site reactions (e.g. cellulitis, inflammation, pain, erythema, swelling).

### **6. Biodistribution & pharmacokinetics**

Following intravenous administration, Technetium oxidronate is rapidly distributed throughout the extracellular space. Skeletal uptake begins almost immediately and

proceeds rapidly. 30 min post injection 10% of the initial dose is still present in whole blood. At 1 h, 2 h, 3 h and 4 h after injection these values are resp. 5%, 3%, 1,5% and 1%.

Clearance from the body takes place via the kidneys. Of the administered activity approximately 30% is cleared within the first hour, 48% within 2 h and 60% within 6 h.

## 7. Literature

- E. Dayan Sandler et al. Duration of Etidronate Effect Demonstrated by Serial Bone Scintigraphy. J Nucl Med. 1991;32:1782-4.
- Santos-Oliveira R et al. Radiopharmaceutical drug interactions: a critical review. Anais de Academia Brasileira de Ciencias 2008;80(4):665-75.
- SmPC TechneScan™ HDP, kit for the Preparation of Technetium Tc 99m Oxidronate.