

⁸⁹Sr chloride

(Metastron[®])

1. Indications

⁸⁹Sr-chloride injection is approved as additive or alternative for external radiotherapy to reduce pain of bone metastases secondary at prostate carcinoma in the stadium where hormone therapy isn't effective anymore.

2. Preparation

Approved product, see summary of product characteristics (SmPC).

3. Quality control

Approved product, see summary of product characteristics (SmPC) and the European Pharmacopeia.

4. Interactions

Calcium-containing medication has to be stopped at least for 2 weeks before ⁸⁹Sr-chloride therapy.

Strontiumralenate: stop 4 weeks before and 2 weeks after therapy with ⁸⁹Sr.

5. Contraindications

⁸⁹Sr-chloride is contra indicated at hypersensitivity to any substance present in the product. It should not be used in patients with low number of neutrophils and blood plates nor in the case of serious damaged bone marrow. It is not used as primary drug for marrow compression secondary to spinal metastases as fast treatment is needed.

6. Adverse events

A small number of patients have reported a transient increase in bone pain the first few days after injection. This is usually mild and self-limiting, and controllable with analgesics. Some degree of haematological toxicity, including thrombocytopenia and leucopenia, is to be expected following administration of ⁸⁹Sr. Typically platelets will be depressed by about 30% within 4-6 weeks of therapy, compared to pre-administration levels. After 3-6 months number of platelets returns to the output value, though this process depends on the extent of neoplastic changes during therapy. More severe depression of platelet levels may be observed in some patients.

Another adverse event often seen is blushing.

7. Biodistribution & pharmacokinetics

Following intravenous injection, soluble strontium compounds behave like their calcium analogs, clearing rapidly from the blood and selectively localizing in bone mineral. Uptake of strontium by bone occurs preferentially in sites of active osteogenesis; thus primary bone tumours and areas of metastatic involvement (blastic lesions) can accumulate significantly greater concentrations of strontium than surrounding normal bone.

The extent of uptake and retention of ⁸⁹Sr will depend on the metastatic involvement of the skeleton. Strontium is retained in lesions with a long biological half-life compared to the physical half-life of ⁸⁹Sr, whilst strontium taken up into normal bone exhibits a half-life of about 14 days. The longer retention of ⁸⁹Sr in metastatic lesions enables the isotope to deliver a larger radiation dose to metastases whilst delivering a relatively small dose to bone marrow.

⁸⁹Sr which is not localized in the skeleton is excreted mainly via the urine with a small amount via the faeces.

Effects become evident 10-20 days after injection.

8. Stability

The shelf-life of this product is 28 days after the activity reference time. The product has to be stored below 25°C, neither in the fridge nor in the freezer.

9. Literature

- SmPC Strontium-89; Sr-89-chloride (Metastron®).
- KNMP kennisbank Strontium Sr 89 chloride.
- SmPC Strontiumchloride, 37,5 MBq/ml Polatom.