Succinate-Sn for labeling with $^{99m}$Tc (DMSA)

Pharmacological Category.
Diagnostic agent used for renal gammagram.

Composition

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimercaptosuccinic Acid</td>
<td>1.00 mg</td>
</tr>
<tr>
<td>Dehydrated tin chloride</td>
<td>0.36 mg</td>
</tr>
<tr>
<td>Ascorbic acid</td>
<td>0.20 mg</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>5.0 mg</td>
</tr>
<tr>
<td>Injection water</td>
<td>c.s.p. 1 ml</td>
</tr>
<tr>
<td>Sodium hydroxide</td>
<td>c.s.</td>
</tr>
<tr>
<td>Hydrochloride acid</td>
<td>C.s.</td>
</tr>
</tbody>
</table>

Pharmacology

$^{99m}$Tc-DMSA is used for examining renal morphology and for determining the functional status of each kidney through renal fixation. $^{99m}$Tc-DMSA allows higher resolution images of the renal cortex. The calices and pelvis areas appear relatively “cold” compared to the cortex-medulla parenchyma due to the fact that urinary excretion of the complex is very weak. Thanks to its high renal concentration, this marker allows the visualization of kidneys, even in cases with marked renal failure.

Pharmacokinetics

The intravenous injection of $^{99m}$Tc-Succinate exhibits a marked affinity for the renal cortex. Its main active ingredient (DMSA) binds to plasma proteins and its blood clearance occurs mainly through tubular absorption. Renal activity increases 6-8 hours following injection of the complex and later reaches a stable level which represents around 45-60 % of the injected activity.

Indications

Used in Renal Gammagramy for examining kidney morphology and assessing the functional status of each kidney by measuring kidney fixation.

Contraindications

This preparation should not be administered to nursing mothers as sodium pertechnetate $^{99}$Tc is passed on to the maternal milk during this period.

Precautions

- This preparation should be administered only by qualified personnel duly authorized to handle radiopharmaceuticals.
- Administer to pregnant women only when strictly necessary as it is not known if this radiopharmaceutical can cause fetal damage or affect fertility.
- Do not administer to patients under 16 years of age unless the resulting benefits outweigh the possible risks.

Warnings

- Make sure that the patient and clinical staff working with radiopharmaceuticals receive as little radiation as possible.
- This preparation is sterile and non-pyrogenic and must therefore be handled aseptically.
- Do not use the solution more than one hour after reconstitution. Keep the preparation at room temperature.
- Labeling reactions with $^{99m}$Tc must maintain tin ions in its reduced state and consequently Sodium Pertechnetate $^{99m}$Tc injections with oxidants should not be administered.
- The reagents in the kit are not radioactive, however, after reconstituting with Sodium Pertechnetate $^{99m}$Tc the solutions must be stored in a protective armored casing.
- The content of the vial is supplied only for preparing $^{99m}$Tc -Succinate-Sn, and therefore should not be administered without prior reconstitution with Sodium Pertechnetate $^{99m}$Tc.

Adverse reactions

Administration of radiopharmaceuticals to patients will inevitably generate a certain amount of radiation, however somatic changes or genetic damage have been reported only during long term treatments. Although this risk may initially seem insignificant it must be borne in mind whenever treating a patient with radiopharmaceuticals. The use of these preparations is justified as long as the benefits outweigh the possible risks posed by the use of radioactive material.
Allergic reactions due to the use of radiopharmaceuticals in most cases exhibit several clinical symptoms such as fever, flush, nausea and a variety of rashes such as urticaria and erythema. Other types of allergic reactions associated with the endovenous administration of the radiopharmaceuticals: pain or irritation at the administration site of the preparation.

Dose.

**Diagnostic dose:** Intravenous injection

- **Adults:** The dose may range from 74 to 185 MBq (2 y 5 mCi). In adults with normal body weight (70 kg), a dose of 74 MBq (2 mCi) is recommended; in case of body weight deviations, the dose is calculated based on a dose of 0.05mCi/kg per body weight.
- **Children:** The total dose is calculated based on 0.05mCi/kg per body weight. The minimum dose is 15 MBq (0.4mCi).

Images will be obtained 3 hours after administering the preparation.

Instructions

Use a hypodermic needle to extract 4 to 5 ml of Sodium Pertechnetate \([^{99m}\text{TcO}_4^-]\), which may contain a maximum of 1850 MBq (50 mCi). The activity selected will depend on the patient’s body weight and on the type of study to be conducted. Remove all the air in the needle as soon as possible. Shake the vial for one or two minutes until the lyophilized has been completely dissolved. The final solution is colorless and transparent.

Storage

Store the product at 2 - 8°C.
The reconstituted product shall be stored at room temperature in a protective lead casing.

Radiological safety measures

The same measures normally used when handling open source diagnostic preparations, in keeping with the regulations in force in the country.

Presentation: