PYROSCINT

Multi-dose kit

Kit for use in the preparation of Technetium-99m tin pyrophosphate (TPT)

Code No.: MR-9

Hungarian Licence No.: OVEI-T-8817/01

ATC code: V0989A 63

QUALITATIVE AND QUANTITATIVE COMPOSITION Each vial contains:

- Reconstitution:
  - Sodium pyrophosphate decahydrate: 60.0 mg
  - Other ingredients: 4.50 mg
  - Acidum ascorbicum: 0.10 mg

The product is to be used after reconstitution of the kit labelling with addition of sterile sodium pertechnetate ([¹⁹⁹ᵐ]Tc) injection. Ph.Eur. to yield a diagnostic radiopharmaceutical imaging agent. Labels for the reconstituted product and labelling swabs (containing 70% isopropyl alcohol) are provided.

CLINICAL PARTICULARS

Diagnostic indications:

- a) Bone scintigraphy, especially recommended in the following cases:
  - Primary bone tumours
  - Bone metastases of other tumours (e.g. prostate, breast, lung cancer)
- b) Determination of blood volume
- c) Determination of cardiac function
- d) Spleen scintigraphy

Major indications are:

- angiographic scintigraphy for:
  - evaluation of ventricular ejection fraction,
  - evaluation of global and regional cardiac wall motion,
  - myocardial phase imaging,
  - organ perfusion and vascular abnormalities imaging,
- diagnosis and localization of occult parot-intestinal bleeding.
- Determination of blood volume.
- Spleen scintigraphy

Posology and way of administration

Administration is by intravenous injection.

For bone scintigraphy studies and visualisation of acute myocardial infarctus Tc-⁹⁹m-pyrophosphate is used directly. Recommended time of taking the tracer is 3-4 hours after injection of the labelled pyrophosphate.

Recommended time of imaging acute myocardial infarctus 60-90 minutes after administration.

Red blood cell (RBC) labelling methods

The stannous pyrophosphate lyophilisate (non radioactive substance) is first reconstituted with isosolic sodium chloride solution for injection. In vivo or in vivo/in vitro red blood cell labelling may be carried out from the recommended range of adult activity and adjusted according to body weight or surface area.

However the Paediatric Task Group of EANM recommends calculating the administered activity from the body weight according to the following table.

<table>
<thead>
<tr>
<th>Adult dose</th>
<th>Activity range (MBq)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 kg = 111</td>
<td>22 kg ± 5.02 ± 0.78</td>
</tr>
<tr>
<td>4 kg = 14</td>
<td>24 kg ± 5.34 kg ± 0.80</td>
</tr>
<tr>
<td>6 kg = 19</td>
<td>26 kg ± 5.66 kg ± 0.82</td>
</tr>
<tr>
<td>8 kg = 23</td>
<td>28 kg ± 5.48 kg ± 0.85</td>
</tr>
<tr>
<td>10 kg = 27</td>
<td>30 kg ± 5.58 kg ± 0.90</td>
</tr>
<tr>
<td>12 kg = 32</td>
<td>32 kg ± 5.69 kg ± 0.90</td>
</tr>
<tr>
<td>14 kg = 36</td>
<td>34 kg ± 5.68 kg ± 0.92</td>
</tr>
<tr>
<td>16 kg = 40</td>
<td>36 kg ± 5.71 kg ± 0.96</td>
</tr>
<tr>
<td>18 kg = 44</td>
<td>38 kg ± 5.73 kg ± 0.98</td>
</tr>
<tr>
<td>20 kg = 48</td>
<td>40 kg ± 5.76 kg ± 0.99</td>
</tr>
</tbody>
</table>

In very young children (up to 1 year) a minimum dose of 80 MBq is necessary in order to obtain images of sufficient quality. For spleen scintigraphy a minimum dose of 20 MBq is necessary. Because of the long lasting fixation of stannous salts on red blood cells, it is recommended not to repeat the procedure before 3 months.

Contra-indications

There are no specific contra-indications.

Special warnings and special precautions for use

- Special scintigraphy
  - It is recommended that in vivo Tc-⁹⁹m RBC labelling be performed prior to administration of indicated contrast media. Otherwise, labelling efficiency will be adversely affected.
  - Special precautions for use
    - Qualified personnel should only handle pyrophosphate labeled drugs as radioactive substances. Each individual must have been adequately educated regarding the use of the pyrophosphate labeled drugs.

PHARMACOLOGICAL PROPERTIES

Pharmacodynamic properties

Intravenous injection of stannous salts induces a 'stannous loading' of erythrocytes. Radioactive stannous pyrophosphate (Tc⁹⁹m) in the blood will be distributed to the organs and tissues in accordance with the normal haemolytic process. Foetal diuresis and frequent bladder voiding are recommended in the case of overdose with pertechnetate(Tc⁹⁹m).

pharmacokinetics

Intravenous injection of stannous salts induces a 'stannous loading' of erythrocytes. Radioactive stannous pyrophosphate (Tc⁹⁹m) in the blood will be distributed to the organs and tissues in accordance with the normal haemolytic process. Foetal diuresis and frequent bladder voiding are recommended in the case of overdose with pertechnetate(Tc⁹⁹m).

Pregnancy

Radioluclidean procedures carried out on pregnant women also involve radiation dose to the foetus. Only imperative investigations should therefore be carried out during pregnancy, when the likely benefit far exceeds the risk incurred by the mother and foetus.

Lactation

Before administering radiopharmaceuticals to a mother who is breast feeding consideration should be given as to whether the investigation could be reasonably delayed until after the mother has ceased breast feeding and as to whether the radiopharmaceutical could be stopped, bearing in mind the potential of activity in breast milk. If the administration is considered necessary, breast feeding should be interrupted for 12 hours and the expressed feeds discarded.

Effects on ability to drive and use machines

No effects on the ability to drive and operate machines are to be expected after use of this product.

Special precautions for use

For each patient, exposure to ionising radiation must be justified on the basis of local and national guidelines for the radiation protection. Adverse effects after the intravenous administration of both the unlabelled and the technetium-99m complexes have been reported in isolated cases (1-5 per 100,000 cases). The following effects have been described: headache, nausea, diarrhoea, dizziness, swelling of the arm, erythema and itching at the injection site, diarrhea and tinnitus, urticaria, generalized pruritus. Cardiac arrhythmia, facial oedema and coma have been reported.

Overdose

In event of the accidental administration of an overdose of the radiopharmaceutical very little supportive treatment can be undertaken except for the clinical necessity. Diuresis and frequent bladder voiding are recommended in the case of overdose with pertechnetate(Tc⁹⁹m).

TECHNICAL LEAFLET

Preclinical safety data

Quantitative assessment of the in vivo safety data specific to technetium labelled erythrocytes. The toxicity of pertechnetate ion and stannous salts has been studied and reported in the literature. Systemic toxic effects are only observed at relatively high doses.
- For splenic scintigraphy the effective dose equivalent resulting from an administered activity of 70 MBq is 2.9 mSv (per 70 kg individual) and the typical radiation dose to the critical organ (liver) is 39 mSv.

**List of excipients**
- Stannous chloride dihydrate
- Acidic sodium citrate

**Incompatibilities**
- None known to date.

**Shell life**
- Shelf life of PYROSCINT in vivo kit (hydrosol and radiopharmaceutical solution) is 24 hours at 2–8°C as quasi stable. The radiation dose will not increase over this period.

**Special precautions for storage**
- PYROSCINT in vivo kit (hydrosol and radiopharmaceutical solution) should be stored at temperature below 25°C in its original packaging. 
- The total activity per vial should not exceed 6.0 GBq. The final volume of the preparation should be between 2 and 5 mL. Place a vial of PYROSCINT in a lead container. Inject into the vial the appropriate volume of sodium pertechnetate(Tc-99m) and the required quantity of diluent so as to be within the volume and activity limits of the preparation.
- Withdraw a volume of dose, equivalent to the volumes of the solutions, in order to balance the pressures. Invert the vial several times in order to homogenise the preparation. Leave to react for a minimum of 15 minutes before use.

**Complete the label using the marking parameters and label the vial and lead container. The labelling yield can be checked by ascending chromatography.**

**Determination of the labelling yield**
- The chromatography conditions are set out in the table below.

<table>
<thead>
<tr>
<th>Chromatography conditions</th>
<th>Collodion</th>
<th>TcO4-</th>
<th>TcO3-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate</td>
<td>ITLC-SG (Gelman)</td>
<td>Sodium acetate 13.6% m/v</td>
<td>Methyl ethyl ketone</td>
</tr>
<tr>
<td>Mobile phase</td>
<td>Dioxin</td>
<td>Complex + collodion: 0.0 to 0.1</td>
<td>Complex + TcO4-: 0.9 to 1.0</td>
</tr>
<tr>
<td>Development</td>
<td>-</td>
<td>99m</td>
<td>99m</td>
</tr>
<tr>
<td>Development time</td>
<td>10 - 15 cm</td>
<td>10 - 15 cm</td>
<td>10 minutes</td>
</tr>
<tr>
<td>Hold time</td>
<td>10 minutes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Additional requirements**
- The sum of the activities of the collodion and the free pertechnetate(Tc-99m) form should not exceed the impurities in the two chromatograms, must not exceed 10% of the total activity.
- The disposal of waste should be in accordance with national and international regulation for radioactive waste.

**MARKETING AUTHORITY HOLDER**
- MEDI-RAD PHARMA Ltd
- 20306 Erd, Stamos u. 10-12.
- HUNGARY

**MARKETING AUTHORITY NUMBER**
- Hungary: OGYI-T-8817/01

**DATE OF REVISION TEXT**
- January 2007