^{123}I ioflupane

DaTSCAN, FP-CiT

1. Indications

^{123}I-ioflupane is indicated for detecting loss of functional dopaminergic neuron terminals in the striatum:

In patients with clinically uncertain Parkinsonian syndromes, for example those with early symptoms, in order to help differentiate Essential Tremor from Parkinsonian Syndromes related to idiopathic Parkinson's Disease, Multiple System Atrophy (MSA) and Progressive Supranuclear Palsy (PSP)

In patients, to help differentiating probable dementia with Lewy bodies (DLB) from Alzheimer's disease. ^{123}I-joflupane is unable to discriminate between DLB and Parkinson's disease dementia.

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

Cocaine and amphetamines (including methylphenidate)

Cocaine and amphetamines are the most clear drugs (of abuse) that will influence the visual and quantitative analysis of ^{123}I ioflupane scans.

Bupropion shows inconsistent effects on DAT imaging, with a possible effect of approximately 20% which may influence visual and quantitative analysis of ^{123}I ioflupane studies.

This group of drugs has a high-affinity binding to the dopamine transporter and consequently will decrease ^{123}I-joflupane uptake.

Table 1. Withdrawal of drugs (of abuse) before investigation

Drugs	Days
Cocaine	2
Amphetamine/dexamphetamine	7
Methylphenidate	1
Bupropion	8
Modafinil	3

Opiates
Fentanyl may cause reduced [^{123}I]ß-CIT binding to striatal dopaminetransporter (DAT). For other opiates, it cannot be excluded that binding to ^{123}I ioflupane is influenced, but data are not strong enough to advocate withdrawing them before a routine ^{123}I ioflupane scan. Fentanyl transdermal patches should be withdrawn 4-5 days before a ^{123}I ioflupane, other presentations 2 days before.

Antidepressants
SSRI's (fluoxetine, fluvoxamine, paroxetine, citalopram, sertraline) and SNRI's (venlafaxine, duloxetine) increase striatal uptake of ^{123}I-joflupane by competition for DAT. There is evidence to suggest that SSRI's influence the quantification of ^{123}I-joflupane to DAT, but these effects are too small to hinder the interpretation of visual assessment. Withdrawal of SSRI's and SNRI's is not necessary.

Anticholinergic drugs
Cholinesterase inhibitors could have a small influence upon DAT imaging. It is unlikely however that cholinesterase inhibitors will significantly influence ^{123}I-joflupane imaging. Anticholinergic drugs may influence visual and quantitative interpretation of ^{123}I-joflupane studies by reducing ^{123}I ioflupane binding to DAT due to its relatively high affinity for DAT. Particularly benztropine and stopping benztropine is recommended 5 days before the study.
Scopolamine might increase striatal ^{123}I ioflupane binding ratios, withdrawal of scopolamine is not recommended for visual analysis of these scans but the potential for imaging interference should be considered when administering ^{123}I ioflupane to patients who are already receiving scopolamine.

Anesthetics
Animal studies showed clear effects of ketamine and isoflurane on DAT imaging. Withdrawal of ketamine and isoflurane 1 day before imaging is recommended.

5. Adverse reactions
Immune system disorders
Not known: hypersensitivity

Metabolism and nutrition disorders
Uncommon: increased appetite

Nervous system disorders
Common: headache
Uncommon: dizziness, formication (paraesthesia), dysgeusia

Ear and labyrinth disorders
Uncommon: vertigo

Gastrointestinal disorders
Uncommon: nausea, dry mouth

General disorders and administration site conditions
Uncommon: Injection site pain (intense pain following administration into small veins)

6. Biodistribution & pharmacokinetics
After intravenous injection ^{123}I-ioflupane is cleared rapidly from the blood; 5 min after injection only 5% of the administered activity remains in whole blood volume. Inclusion in brain tissue is rapidly, rising to 7% of the injected activity after 10 min and declining to 3% after 5 h. About 30% of the total activity of the brain tissue can be attributed to striatal uptake. After 48 h, about 60% of the injected radioactivity was excreted in the urine; with fecal excretion calculated at approximately 14%.

7. Stability
2,5 ml vial: 7 h from the activity reference time stated on the label.
5 ml vial: 20 h from the activity reference time stated on the label.

8. Literature

- SmPC DaTSCAN 74 MBq/ml oplossing voor injectie; I-123-ioflupane.
- Booij J, Kemp P. Dopamine transporter imaging with [123I]FP-CIT SPECT: potential effects of drugs. Eur J Nucl Mol Imaging 2008;35:424-38.