PRODUCT MONOGRAPH

IODINE-131 METAIODOBENZYLGUANIDINE

Radiodiagnostic Agent
(Localization of Pheochromocytoma)

Edmonton Radiopharmaceutical Centre
Edmonton, Alberta
RN-8402
Date of Preparation:
September 5, 1984

NAME OF DRUG
IODINE-131 METAIODOBENZYLGUANIDINE

THERAPEUTIC CLASSIFICATION
Radiodiagnostic Agent for the localization of Pheochromocytoma

DESCRIPTION

Iodine-131 Metaiodobenzylguanidine is a sterile, pyrogen-free solution of Iodine-131 labelled Metaiodobenzylguanidine for intravenous administration. Each 18.5 MBq of Iodine-131 metaiodobenzylguanidine contains Metaiodobenzylguanidine Sulfate (0.1-0.25mg), Sodium Acetate (less than 0.4mg), Benzyl Alcohol (0.9%), in Normal Saline (0.9%). Final concentration is normally 37 MBq/ml at calibration time or as labelled.

ACTION

When administered intravenously in normal subjects some localization of Iodine-131 Metaiodobenzylguanidine occurs in the liver and spleen. This activity mainly clears by 48 hours after administration. Excretion is via the urine. Localization does not usually occur in the adrenal glands of normal patients. However, adrenal localization may be seen in a small fraction (20%) of normal patients, e specially at later time periods.

In patients with multiple endocrine neoplasia (MEN Type 2) and their kindreds, localization in the adrenals may frequently be seen. This may be due to adrenal medulla hyperplasia. Please refer to the report by Nakajo and co-workers (6) on the normal variations of Iodine-131 Metaiodobenzylguanidine distribution in man.

In patients with pheochromocytoma, localization is reported to occur in the lesion soon after administration. Imaging up to 48 hours after administration may be necessary due to interference at earlier times by the liver background.

There has been one report of false positive uptake in the contralateral adrenal medulla of a patient with pheochromocytoma (7).

INDICATIONS

Iodine-131 Metaiodobenzylguanidine may be useful in the localization of pheochromocytomas (1,2,3). It has also been reported to localize in one case of neuroblastoma(3).

CONTRAINDICATIONS

This radiopharmaceutical is contraindicated in pregnancy. Drugs that interfere with neuronal uptake and storage of catecholamines such as Reserpine, Cocaine, Oubaine and the Tricyclic Antidepressants have been reported to potentially inhibit the uptake of this agent in pheochromocytomas (5).

ADVERSE REACTIONS

No adverse effects attributable to the use of Iodine-131 Metaiodobenzylguanidine have been reported to date.

WARNINGS

Radiopharmaceuticals should be used only by qualified physicians who have been licenced by the appropriate government agency to use and administer radiopharmaceuticals.

Where the assessment of the risk/benefit ratio suggests use of this product in lactating mothers, nursing should be discontinued.

Ideally, examination of women of childbearing capability should be performed during the first few (10) days following the onset of the menses.

Adequate studies have not been performed to support the use in children under 18 years of age. The benefit/-risk ratio should be assessed before consideration of the use of this product in this age group.

PRECAUTIONS

Adequate shielding of Iodine-131 Metaiodobenzylguanidine must be maintained at all times to minimize radiation exposure to personnel and patients. The components of Iodine-131 Metaiodobenzylguanidine are sterile and non-pyrogenic. It is essential that the user adheres to strict aseptic procedures during use.

TOXICOLOGY

The safety of Metaiodobenzylguanidine was investigated in mice. Intravenous injection of 21.5mg/kg and 10.6mg/kg resulted in immediate death.

Five mice were injected intravenously with 4.26mg/kg Metaiodobenzylguanidine (approximately 1200 times maximum human dose on a weight basis) daily for five days. Animals were monitored for four weeks. There was no evidence of immediate or delayed gross effects at this dose level. Histological examination of tissue (lung, liver, heart and kidney) identified no morphological changes attributable to drug toxicity. Metaiodobenzylguanidine has been reported to inhibit monoamine oxidase by 50% at a concentration of 8 x 10^-6M (in vitro) (8). Concentrations of this order may be reached in some tissues in vivo following a diagnostic dose of Iodine-131 Metaiodobenzylgua nidine.

No adverse effects of Iodine-131 Metaiodobenzylguanidine have been reported in published clinical studies (2,3).

Edmonton Radiopharmaceutical Centre Iodine-131 Metaiodobenzylguanidine has been administered to over sixty patients. No adverse effects attributable to the drug have been noted.

PATIENT PREPARATION

It is recommended that 30 mg of Iodine, in the form of Lugols Solution or Potassium Iodide Solution, be administered the day preceding the injection of Iodine-131 Metaiodobenzylguanidine and for the following four days.

DOSAGE AND ADMINISTRATION

The recommended adult dose of Iodine-131 Metaiodobenzylguanidine is 18.5 MBq (500 uCi) administered by slow intravenous injection.

If an assessment of risk to benefit ratio suggests the use of this product in children then the pediatric dosage should be calculated as a percentage of the adult dose based on body surface area (Table 1).

The patient dose should be measured in a suitable calibration system immediately prior to administration. (See Table 2).

Table 1
Percentage of Adult Dosage for Patients of Varying Weight or Surface Area (4)

Weight		Surface Area	Percentage
Kg	lb.	Sq. Meters	Adult Dose
3	6.6	0.20	12
6	13.2	0.30	18
10	22.0	0.45	28
20	44.0	0.80	47
30	66.0	1.00	60
40	88.0	1.30	76
50	110.0	1.50	88
65	143.0	1.70	100
70	154.0	1.76	103

Table 2
Physical Decay Chart: Iodine-131 Half-Life 8.1 Days

Days	Fraction Remaining
0	1.000
1	0.918
2	0.842
3	0.773
4	0.710
5	0.651
6	0.598
7	0.549

RADIATION DOSIMETRY
Table 3
Approximate Absorbed Radiation Doses (From Lynn et al(2)

	Grays/18.5 MBq
Adrenal Medulla*	0.5
Thyroid (Blocked)+	0.007
Liver*	0.002
Heart Wall*	0.004
Spleen*	0.008
Ovaries	0.005
Whole Body+	0.001

+From Human Data
*From Animal Data

STORAGE
Iodine-131 Metaiodobenzylguanidine should be stored refrigerated at 4oC.

Expiry is 7 days after calibration.

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