MIBG Scan

Updated
9/8/2024

- **Indication**
  - To detect, localize, stage and follow neuroendocrine tumors and their metastases (pheochromocytomas, neuroblastomas, ganglioneuroblastomas, ganglioneuromas, paragangliomas, carcinoid tumors, medullary thyroid carcinomas, Merkel cell carcinoma, MEN2 syndromes), study of tumor uptake and residence time in order to decide and plan a treatment with high activities of radiolabeled MIBG, evaluation of tumor response to therapy by measuring the intensity of MIBG uptake and the number of focal MIBG uptake sites and confirmation of suspected tumors derived from neuroendocrine tissue.
- **Radiopharmaceutical:**
  - 10 mCi I-123 MIBG administered IV via a peripheral vein slowly over 5 mins
- **Patient Preparation:**
  - The patient will need iodine blockade of his/her thyroid using 130 mg potassium iodide capsules. One capsule the morning before, 1 capsule the morning of and 1 capsule the morning after MIBG administration. Patients allergic to iodine can receive 1 capsule of 400 mg potassium perchlorate the morning of MIBG administration.
  - Have the patient drink 16-20 oz of water 30-60 mins prior to exam to ensure adequate hydration.
  - Have the patient empty his/her bladder immediately prior to imaging. Instruct the patient to void frequently for a day following the exam.
- **Conflicting Examinations/Medications:**
  - Numerous substances interfere with MIBG localization. See following list for specific hold times.
  - Patients should hold caffeine for 24 hrs.
  - Patients with catecholamine-secreting pheochromocytomas and paragangliomas may be receiving alpha or beta-blockade and may be unable to hold these medications.
  - No Nuclear Medicine exams within the previous 24 hrs.
  - No barium GI exams within the previous 48 hrs.
- **Pregnancy/Lactation:**
  - Pregnancy testing is only needed in potentially pregnant patients who state they could be pregnant. See Pregnant, Potentially Pregnant and Lactating Patients policy for specifics.
  - Breast milk should be discarded for 2 days following I-123 MIBG administration.
- **Imaging Technique:**
  - Collimator - LEHR or medium energy high resolution
  - Photopeak - 159 keV 20% window for I-123
  - Image Preset Counts
    - Whole Body Images - 5 cm/min
    - Static Images - 500k counts/image or 10 mins/image
    - SPECT Images - 60 stops, 25-35 secs/stop
  - Matrix Size - 256 x 1024 (whole body), 256 x 256 (static), 128 x 128 (SPECT)
  - Patient Positioning - supine
- **Imaging Views:**
  - Standard Images
    - Obtain anterior and posterior whole body images (eyes to thigh) at 24 hrs.
    - Add static images of any focal findings at the discretion of the Nuclear Medicine Technologist.
    - Check with the Radiologist before discharging the patient to see if any additional static imaging of a particular area or 48 hrs imaging is needed.
  - SPECT Images (Only if Requested)
    - Check with the Radiologist to determine the anatomical coverage for SPECT images.
    - Obtain SPECT images with axial, coronal and sagittal reconstructions after the 24 hrs static images are obtained.
    - Obtain a 3D horizontal spinner.

- **Medications/Substances to Hold:**

amisulpride 72 hrs
amitriptyline 48 hrs
amlodipine 48 hrs
amoxapine 48 hrs
amphetamines 48 hrs
atomoxetine 5 days
brimonidine 48 hrs
caffeine 24 hrs
chlorpromazine 24 hrs
clomipramine 24 hrs
clozapine 7 days
cocaine 24 hrs
diltiazem 24 hrs
dobutamine 24 hrs
dopamine 24 hrs
doxepin 24 hrs
ephedrine 24 hrs
felodipine 48 hrs
fluphenazine 24 hrs
fluphenazine depot 1 mth
guanethidine 48 hrs
haloperidol 48 hrs
haloperidol depot 1 mth
imipramine 48 hrs
isradipine 48 hrs
labetalol 72 hrs
methylphenidate 48 hrs
mirtazapine 8 days
modafinil 72 hrs
nicardipine 48 hrs
nifedipine 24 hrs
nimodipine 24 hrs
nisoldipine 48 hrs
norepinephrine 24 hrs
nortriptyline 24 hrs
olanzapine 7-10 days
oxymetazoline 24 hrs
perphenazine 24 hrs
phenoxybenzamine IV 15 days
phenylephrine 24 hrs
phenylephrine 48 hrs
pimozide 72 hrs
prochlorperazine 24 hrs
promethazine 24 hrs
pseudoephedrine 48 hrs
quetiapine 48 hrs
reserpine 48 hrs
risperidone 5 days
risperidone depot 1 mth
salmeterol 24 hrs
terbutaline 24 hrs
thioridazine 24 hrs
tramadol 24 hrs
trifluoperazine 48 hrs
trimipramine 48 hrs
venlafaxine 48 hrs
verapamil 48 hrs

- **Notes:**
  - MIBG is an analogue of noradrenaline and guanethidine.
  - Adverse effects of MIBG administration include tachycardia, pallor, vomiting and abdominal pain and are minimized by administration via a peripheral vein slowly over 5 mins.
  - Physiologic distribution of MIBG is primarily in the liver, adrenal glands, kidneys and bladder. Lesser degrees of uptake can be visualized in the spleen, lungs, salivary glands, skeletal muscles and myocardium.
  - MIBG may also accumulate to variable degrees in the nasal mucosa, lungs, gallbladder, colon and uterus. Free iodine in the bloodstream may cause some uptake in the digestive system and in the thyroid.
  - Skeletal uptake should not be seen. Extremities should show only slight muscular activity.
  - MIBG soft-tissue uptake is observed in primary tumour and in metastatic sites including lymph nodes, liver, bone and bone marrow. Increased uptake in the skeleton (focal or diffuse) is indicative of bone marrow involvement and/or skeletal metastases.