

## ROLE OF NUCLEAR MEDICINE IN INDIA

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Nuclear Medicine today is a well established independent speciality in India. In last two decades Nuclear Medicine has made important strides. From modest beginning in early 60s, there are now over 200 medical establishments making use of radioisotopes. This had been possible because India has made huge investments in development of Atomic Energy. It has four operational power producing reactors and two are near completion. A new fast breeder reactor would be operational by the end of this year. Production of radio-pharmaceuticals is carried out at Bhabha Atomic Research Center (BARC), Bombay. One of the reactor 'CIRUS' has been located within the complex providing irradiation facility. A new reactor 'DHRUVA' will become operational from next month which would further help in meeting the increasing demand of radiopharmaceuticals by various hospitals. Most of the iodinated compounds required for clinical use e.g.  $I^{131}$  Hippuran  $I^{131}$ , Rose Bengal,  $I^{131}$  Albumin etc. are provided in their final injectable form.

The BARC has been supplying a solvent extraction based  $^{99m}Tc$  generator to nearly 35-40 institutions in India and 350-400 curies of  $Mo^{99}$  are being supplied annually. Due to low specific activity of  $Mo^{99}$  produced at CIRUS reactor, the preparation of column generators had not been possible. A wide range of kits for various  $^{99m}Tc$  labelled formulations e.g. sulphur colloid, phytate, EHDP, glucoheptonate, DTPA, HSA microspheres etc. are also supplied to the users.

### **RIA Kits:**

The BARC had been also active in producing range of RIA kits. Over 150 Kits of  $T_3$ ,  $T_4$  & TSH and about 20 kits of Insulin, HCG, HPL, HGH, Angiotensin-I are being supplied every month. Development of RIA procedures for infectious diseases have particular significance in tropical country like ours. Realising this need, an exclusive programme for development of RIA kits for filariasis, Malaria, Australia antigen etc. have been included in 7th five year plan.

### **Isopharm – Vashi, New Bombay**

To meet ever increasing demand for radio-pharmaceuticals, a new radio-pharmaceutical laboratory has been built at Vashi New Bombay known as Isopharm. This exclusive facility for production of radiopharmaceuticals with special features incorporated for handling of large quantities of radioactivity will go longway in meeting the entire requirements of radiopharmaceuticals of our country. The second most important aspect in practice of Nuclear Medicine is instrumentation.

We have ECIL a Govt. of India undertaking which manufactures all the equipments required for practice of Nuclear Medicine except Gamma-Camera. Gamma-Camera has still to be imported which being a costly equipment there are only 19 institutions which have gamma-cameras and ten with computers. The largest number of Nuclear Medicine Departments are in Bombay numbering 12. The radiation Medicine Centre run by Atomic Energy Commission of India is the largest unit and has been recognised as regional referral centre of WHO/IAEA for Nuclear Medicine in S.E. Asia region. The Another big institute belongs to Ministry of Defence located at Delhi. Both these institutes conduct research as well as postgraduate training programme.

### **Society of Nuclear Medicine (India):**

The Society is now 15 years old with membership of 362. It holds annual convention where nearly 70-80 original papers are presented in addition to guest lectures, symposia etc. With all this rosy picture, we feel that for a country of our size it is not enough. However, recently no large hospital (beds more than 250) has come up without provision for a Nuclear Medicine Department. The referrals have been increasing every year. In my own hospital, since we acquired computerised gamma camera in late 1981, there is rising pattern in all referrals except 'Brain' which have declined after we installed a CT scan. However, Radiation Medicine Centre where there is no CT scan facility there is no decline. With introduction of by-pass surgery in our hospital cardiac studies have increased, as we assess all cases going for bypass surgery before as well as after surgery.

Lastly, India has contributed some methodological advances in the field of Nuclear Medicine e.g.

1. Double tracer technique for Vit. B<sub>12</sub> absorption.
2. I-131 liver count as measure of PBI-131.
3. New Aerosol Apparatus for inhalation lung imaging.
4. Regional blood flow study to distinguish between liver space occupying lesions (Abscess; metastasis).
5. RIA for thyroglobulin and biochemical marker for thyroid metastasis.
6. New RIA for TB antigen.
7. Radiometry for drug susceptibility in tuberculosis.

Apart from usual hospital role, the Nuclear Medicine has helped in understanding pathophysiology of some diseases indigenous to India. The outstanding example is survey of Himalayan endemic goitre, where it has been established that neonate hypothyroidism is as high as 4%. Another contribution is; establishing viable assay for T.B. antigen and antibody for early detection of tuberculosis which is rampant in our country.

In conclusion, I would like to say that we in India are quite fortunate in this region that we are more or less self reliant in most of the ingredients required for practice of Nuclear Medicine. However, country is vast and Nuclear Medicine has still to reach to masses.