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Research Article

**EFFICACY OF RADIOACTIVE IODINE FOR THE  
TREATMENT OF HYPERTHYROIDISM****\*Dr. Noreen, \*Dr. Farkhanda Shoukat, \*Dr. Nousheen Fatima****\*Quaid-e-Azam Medical College, Bahawalpur Pakistan****Abstract:**

**Objective:** To investigate the results of radioactive iodine (RAI) in the treatment of hyperthyroidism.

**Study design:** A retrospective study.

**Location and duration:** In the Endocrinology Department, Nishtar Hospital, Multan for one year duration from July 2016 to July 2017.

**Method:** By Radioactive iodine 216 patients were treated. It has been shown to possess hyperthyroidism with function test (T3, T4 and TSH) and isotope discovery of the thyroid gland. RAI in 10 mci was given to all of them and were followed up for at least a year later one month later and every two months. The efficacy of the treatment was evaluated by thyroid function tests clinical features improvement.

**Findings:** 216 total patients were observed,  $37.01 \pm 11.24$  years was the average age. Women were 153 and males were 63. In 164 patients [66.05%] Graves' disease was noted, 37 patients [25.1%] have toxic multinodular goiter and 16 patients [9.3%] toxic adenoma. After one month only Symptoms improved in 11 patients, but for two months others needed antithyroid therapy. After 6 months treatment only 17 patients have hyperthyroidism.

**Conclusion:** For hyperthyroidism treatment radioactive iodine is very effective but has side effects such as fatigue, hypothyroidism and weight gain.

**Keywords:** Radioactive iodine, hyperthyroidism.

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**INTRODUCTION:**

Hyperthyroidism is a widespread endocrine problem globally, with two (2/1000) incidence in areas with adequate iodine. Many different disorders can cause hyperthyroidism. The exact cause and clinically assessed symptoms and severity is important, as clinicians will guide about treatment options. Since 1940 Radioactive iodine has been used to manage hyperthyroidism. Radioactive iodine safety, low cost and efficacy have been the definitive treatment in the majority of patients with this problem. In the United States, for hyperthyroidism the most popular treatment is Radioactive iodine but less famous elsewhere. Radioactive iodine is the 1<sup>st</sup> line treatment if there is no contraindication in patients with hyperthyroidism and the patients give informed consent.

**MATERIALS AND METHODS:**

This Retrospective study was conducted in the Endocrinology Department, Nishtar Hospital, Multan for one year duration from July 2016 to July 2017. The analysis was performed by the third generation of TFT (TSH, FT4 and FT3) radioimmunoassay in all patients presented with clinical symptoms of thrombosis, weight loss, tremor or excessive sweating. If high FT4 or FT3 with low TSH levels were seen, a thyroid scan was performed to know the thyrotoxicosis etiology. It is recommended that patients prefer to use radioactive iodine [pregnancy or lactation] if there is no contraindication to the disease with high intake of focal or diffuse. The side effects and efficacy of radioactive iodine are clearly

explained by giving information about other treatment methods (surgical or antithyroid drugs). According to the increasing size of patients receiving radioiodine doses of radioiodine, they were recommended to be away from children during the size evaluation by thyroid 5 MCI, 10 MCI or 15 MCI. Radioactive iodine was stimulated 48 hours after the woman and 6 months after the pregnancy. One month later the patients were followed up with TFT and then every 3 months with complete examination and symptoms. After six months of receiving radioactive iodine Patients remaining thyrotoxic since received another dose. The Surgery was performed if no response was obtained after 3 RAI doses. The patient's sex, age, hyperthyroidism, etc. [Multinodular goiter, Graves' disease, toxic adenoma], clinical appearance, treatment (medical, surgical or radioactive iodine) and results (euthyroid, hyperthyroid or hypothyroid) mode. Statistical analysis was performed with SPSS 7-5 (Statistical Package for Social Sciences). The mean  $\pm$  SD was evaluated for the quantitative data and for the categorical variables the frequency was evaluated. For categorical variables to analyze group differences Chi-square was used and  $p < 0.05$  was taken constant.

**RESULTS:**

322 total patients were diagnosed within 3 years and for at least one year were followed and all results were analyzed. Graves' disease was diagnosed as 211 patients [65.55%] with 1.81 [25.1% male with multinodular goitre toxicity and 31 [0.08] had a toxic adenoma.

Table-I: Clinical feature of 322 patients with thyrotoxicosis

| <i>Symptoms</i>          | <i>Patient No.</i> | <i>Signs</i>    | <i>Patient No.</i> |
|--------------------------|--------------------|-----------------|--------------------|
| Palpitation              | 291                | Diffuse goiter. | 171                |
| Tremors                  | 290                | Multinodular.   | 57                 |
| Weight loss              | 271                | Single nodule.  | 36                 |
| Nervousness              | 301                | Tremors.        | 301                |
| Heat intolerance         | 243                | Exophthalmoses. | 243                |
| Increased sweating       | 253                | Lid lag         | 183                |
| Increased appetite       | 187                | Lid retraction  | 157                |
| Dyspnea                  | 121                | Ophthalmoplegia | 21                 |
| Menstrual irregularities | 273                | myopathy        | 44                 |
| Diarrhea                 | 173                |                 |                    |
| Fatigue                  | 123                |                 |                    |
| Dysphagea                | 13                 |                 |                    |

As shown in Table I, tremor, palpitations, nervousness, cold intolerance and weight loss were the most common clinical manifestations. 290 patients (91%) were under 51 years old and above 50 years old patients ratio was 49%. 216 patients underwent subtotal thyroidectomy (65%), 73 patients (22.6%) antithyroid and 33 patients (10%). The results of the various treatments given are shown in Table II.

Table-II: Outcome of different modes of therapy

| Therapy           | Euthyroid   | Hypothyroid  | Hyperthyroid |
|-------------------|-------------|--------------|--------------|
| Medical (73)      | 43 (58.9)   | 17 (23.28)   | 13 (17.8)    |
| Radioiodine (216) | 42 (19.44)  | 157 (72.685) | 17 (10.82)   |
| Surgical (33)     | 11 (33.333) | 16 (51.515)  | 6 (18.18)    |

157 patients (73.48%) managed with radioactive iodine were euthyroid after two to six months. Thirteen patients within two to three months were in hypothyroid state. 42 [18.99%] patients were managed by radioactive six months later become euthyroid, but only 17 [10.82%]. Of these, 12 male and 5 female patients remained clinically and biochemically hyperthyroid. In all, another radioactive iodine [10  $\mu$ Ci] was used, giving a good response with hypothyroidism at 14. After the second dose of radioactive iodine, three patients remained hyperthyroid and a third dose of [15  $\mu$ Ci] was recommended, but only one was accepted and responded well. 43 patients were treated [58.9%], 17 patients [23.28%], and three months later, euthyroid hypothyroidism but 13 [17.8%] patients were treated with antithyroid drugs [neomercazol]. Surgically euthyroid patients were only 11 [34.03], [51.5%] 17 patients were hypothyroid and hyperthyroid were 7 patients [17.98%]. Common side effects of all treatment modalities were weight gain and fatigue, while with radioactive iodine treated patients (70%) and in surgically treated patients only 40%. Two patients who were treated with bilateral palsy of the vocal cords was surgically developed. Both require permanent tracheotomy. This makes hyperthyroidism treatment with radioactive iodine a standard treatment. Hypocalcemia was observed in 32 patients managed with radioactive iodine and surgical treatment was applied to 11 patients.

#### DISCUSSION:

Hyperthyroidism is a generalized endocrine disorder with a 2: 1000 global spread with sufficient iodine area. Identification of the cause of hyperthyroidism and clinical evaluation of the severity of symptoms is important because doctors will guide the choice of treatment. The clinical findings and causes of thyrotoxicosis in our patients were comparable to those published in the analysis. The disease is the most common caused by toxic multinodular goiter, a similar finding reported by others. Clinical manifestations of excessive sympathetic activity are co-presented, consistent with those reported. We noticed that in the last 10 years in Pakistan, hyperthyroidism increased from 1.77 and 1.49 to 3.88 and 3.1. Radioactive iodine (RAI) has been in use since 1940 to manage hyperthyroidism. The safety, low cost and efficacy is the preferred treatment for most patients with this disorder. The efficacy of all different treatment modalities can be compared to better results in the radioactive iodine group with higher hypothyroidism incidence [73.01]. In pregnancy radioactive iodine is contraindicated. Fetal thyroid tissue is destroyed at 10-12 weeks by radioactive iodine and causes cretinism. In the previous 10 days, menstruation does not increase the likelihood of pregnancy, but we would prefer to

exclude pregnancy with a pregnancy test or careful history. There were 17 cases resistant to radioactive healing [10.82], six months after treatment, hyperthyroidism remained, 14 patients received another dose, and two patients needed a third dose. Except hypothyroidism, radioactive iodine seems to be quite safe. The best treatment for our patients with hyperthyroidism was Radioactive iodine. The common side effects associated with hypothyroidism are fatigue and Weight gain. Radiation thyroiditis is the other side effect. A stay of 2 to 3 weeks can cause severe pain in the thyroid and cause an outbreak of hyperthyroidism. The Cooperative Thyrotoxicosis Labor Force was followed by 34,993 patients from 26 centers for cancer mortality after treatment with radioactive iodine. They did not report an increase in leukemia or cancer incidence after an average of 8.2 years of follow-up. A recent analysis of 1990, which represents an average follow-up of 21-year data, revealed that there was no increase in overall cancer deaths. However, unlike previous reports and other reports, long-term follow-up showed a small rise in the risk of thyroid cancer. In the UK another analysis of 7417 patients showed a major increase in the thyroid cancer incidence. In the previous report of the Cooperative Working Group, the risk of thyroid adenoma increased in adolescent radioactive iodine

recipients, but no cancer was found. Whether radioactive iodine therapy affects progress or progression of Graves ophthalmopathy is controversial. In the early studies, onset of ophthalmopathy and its progression was observed after or during the treatment of Graves's hyperthyroidism, but not by radioiodine.

### CONCLUSION:

In conclusion, in patients with early benign complications such as hypothyroidism, radioiodine is very safe and we recommend for all the cases of hyperthyroidism if there is no contraindication.

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