

Evaluation Results and Complications Treatment of Grave's Disease with Radioiodine (I¹³¹)

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Abstract: Patients with Graves' disease are usually treated with radioiodine after unsuccessful antithyroid drug medication, occurrence of side effects from antithyroid drugs or because of high risk of surgery. The aim of this study, is evaluation of the results and complications of treatment of Graves' disease with radioiodine. In a cross sectional descriptive-analytical study, 300 patients with Graves' disease who were treated with radioiodine in Endocrinology and Metabolism clinic of Tabriz Medical Sciences University between 2001-2004 were selected and followed up for one year regarding complications and response to treatment. Data analyzed by SPSS 11.5 software and T-test and Chi-Square test and the level of meaningfulness was considered as $p < 0.05$. 116(38.7%) of patients were male and 184(61.3%) of patients were female. Mean of age in male patients was 41.04 ± 11.70 years and mean of age in female patients was 41.27 ± 12.51 years ($p = 0.875$). Mean of radioiodine administration dosage in male patients was 13.53 ± 4.60 mCi and in female patients was 11.53 ± 5.03 mCi ($p = 0.001$). Thyroid size was significantly decreased after treatment ($p = 0.000$). 11(3.7%) of patients were involved to ophthalmopathy. Ophthalmopathy in two patients were intensification and in 33 patients were recovered. At one year followed up, 246(82%) of patients were euthyroidism. Treatment of Graves' disease with radioiodine is one of the most useful, safety and available treatment. Exacerbation of ophthalmopathy after radioiodine treatment was one of the most common complications. Prevalence of hypothyroidism was 18%. Radioiodine causes significant decrease in thyroid gland size.

Key words: Graves' disease, radioiodine, treatment, complications, antithyroid, patients

INTRODUCTION

Grave's disease is the most common cause of hyperthyroidism which accounts for 60-80% of thyrotoxicosis. The female/male ratio in this disease is 10-1. An ideal treatment for this disease has not been found yet. Radioactive iodine has been used to treat this disease over 60 years. The only side effect of treatment of this disease by using I¹³¹ is hypothyroidism but it is the best choice for treatment of Graves' disease.

After ten years of treatment, radioactive iodine causes hypothyroidism in 60-70% of patients.

Radioactive iodine therapy has short treatment duration than anti thyroid drugs. Therefore, because of the short treatment, easy administration method, suitable response and low cost for follow up treatment, use of

iodine therapy for thyrotoxicosis with every cause, has been recommended (Leary *et al.*, 1999).

Radioactive iodine is used for the initial treatment of graves and relapse after treatment by anti-thyroid drugs. There is a little risk of thyrotoxic crisis after treatment with radioactive iodine in general doses of 5-15 mci (Kapaln *et al.*, 1998; Fauci *et al.*, 2005). For prevention of thyrotoxic crisis, elder patients together with the patients with cardiac disorders should be treated with anti-thyroid drugs at least one month before radioactive iodine.

The risk of hypothyroidism after radioiodine treatment depends to the dose and it is at least 10 -20% in the first year and 5% every year after the first year, so the patients should be followed carefully at the first year and once every year in the next years.

The aim of this study is to evaluate the results and treatment complications of using radioactive iodine in patients with Graves' disease.

MATERIALS AND METHODS

In a cross-sectional and descriptive-analytical study, we selected 300 patients with Graves' disease that treated with radioactive iodine during 2002-2004 in the endocrinology and metabolism clinic of Tabriz University of Medical Sciences. Patients followed up at least for one year for complications and response to treatment. Variables under study were included: age, gender, intensity of signs, size of thyroid at the initial calling and 3, 6 and 12 months after treatment, previous treatments, ophthalmopathy and its intensity at the initial recognition and at the end of treatment, the initial and ultimate level of TSH, transient and acute complications of I131 therapy, hypothyroidism, success euthyroidism rate, doses of iodine given to the patients, changes in clinical signs after treatment by iodine, ultimate results of treatment by iodine regarding the size of thyroid and ophthalmopathy. The necessary information has been collected from the patient's records and then it has been used in the special questionnaires.

Data analyzed with SPSS 11.5 ant T-test and Chi-square. Descriptive findings reported as mean and present of frequency and the level of meaningfulness was considered as $p < 0.05$.

RESULTS

One hundred and sixteen (38.7%) of patients were male and 184(61.3%) of them were female. The mean age of male and female patients were 41.04 ± 11.70 and 41.27 ± 12.51 years, respectively and no significant difference was found between mean age in two genders ($p = 0.875$). One hundred and sixty patients had severe hyperthyroidism, 99 patients had moderate hyperthyroidism and 41 patients had mild hyperthyroidism.

The mean of TSH at initial visit and one year after treatment were 0.096 ± 0.082 and $5.41 \pm 2.25 \mu\text{U mL}^{-1}$, respectively and a significant increase was found in TSH level at one year after treatment in comparison with initial visit ($p < 0.001$). In most patients, the primary size of thyroid has been increased. The size of thyroid before and after treatment has been shown in the Table 1, which shows a significant decrease in the size of thyroid after treatment compared to before treatment ($p < 0.001$).

Eleven (3.7%) patients were affected by ophthalmopathy. Ophthalmopathy was exacerbated in 2 patients and improved in 33 patients. The frequency of

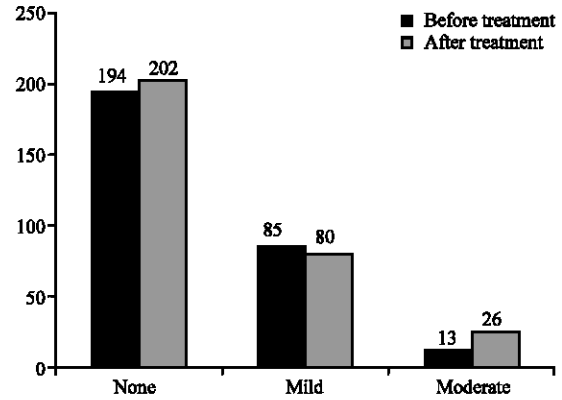


Fig. 1: Intensity and frequency of ophthalmopathy in before and after treatment

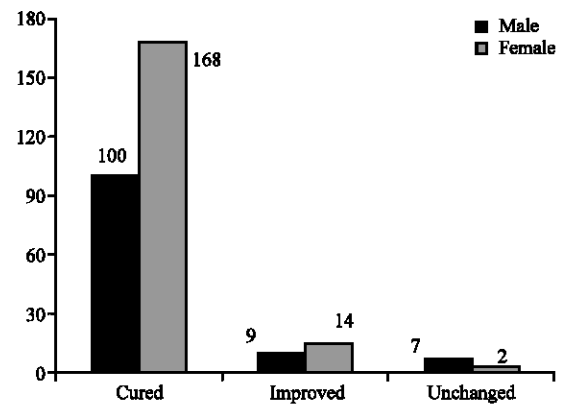


Fig. 2: Response to treatment and changes signs in two genders ($p = 0.049$)

Table 1: Frequency of thyroid size of patients in clinical examination

Thyroid size	Initial size	3 month after	6 month after	12 month after
Impalpable	0	29	57	100
Palpable	3	129	188	172
Double size	107	126	48	24
Triple size	150	15	7	3
Quadruple size	33	1	0	1
Huge	7	0	0	0

ophthalmopathy before and after treatment has been shown in Fig. 1. Most patients has been received Methimazol before getting iodine. Two hundred and sixty eight patients had gotten single iodine dose but 32 patients had gotten radioactive iodine more than one dose. The rate of response to treatment and decrease in intensity of signs in female patients was more than males. The signs of patients after treatment in both sexes have been shown in Fig. 2. At the end of study, 24 patients (18%) had hypothyroidism and were under medical therapy with levothyroxine Na and other patients had normal thyroid function and were euthyroid. The mean

received iodine dose in patients who were hypothyroid after treatment was 11.02 ± 4.3 mci and it was 12.28 ± 5.06 mci in patients who were euthyroid. The mean received iodine dose in the euthyroid patients was significantly more than the patients with hypothyroidism ($p = 0.041$). None of the patients showed the acute effects of radioactive iodine.

DISCUSSION

The primary size of thyroid has been increased in most patients with grave's disease and radioactive iodine caused significant decrease in the size of thyroid of these patients ($p < 0.001$).

Ruchala *et al.* (2005) showed that the size of thyroid has been decreased after radioactive iodine therapy.

The most important complication radioactive iodine is hypothyroidism (Chiovato *et al.*, 1999). After examining the grave's patients who were been treated by radioactive iodine, Walter and his colleagues asserted that 60% of their patients were euthyroid, 20% were hypothyroid and 20% were hyperthyroid (Walter *et al.*, 2004).

In our study, by one year follow up, just 18% of patients were hypothyroid and frequency of euthyroidism was 82% which was better than the results of the above study.

The initial level of TSH is one of the most important factors contributed in the results of treatment of grave's patients by radioactive iodine (Leary *et al.*, 1999).

In this study the mean level of TSH has been significantly increased after radioactive iodine therapy ($p < 0.001$).

Ruchala *et al.* (2005) with evaluation of grave's patients after radioactive iodine treatment showed that the mean of TSH level has been increased from $0.081 - 4 \mu\text{U mL}^{-1}$.

Hadi Ali and his colleagues established that grave's disease is a common disorder in the females and 70.7% of the patients were female and the mean age of them at the time of diagnosis was 38.17 year (Hadj *et al.*, 2004).

In our study, 61.3% of the patients were female and the mean age of them at the time of diagnosis was 41.8 year.

Occurrence and exacerbation of ophthalmopathy is one of the most common side effects of radioiodine treatment of patients with grave's disease (Chiovato *et al.*, 1999).

In our study, just in 4.3% of patients their ophthalmopathy and ocular signs have been intensified.

CONCLUSION

Treating the grave's disease with radioactive iodine is one of the most available and safe treatments.

Radioactive iodine is one of the useful and short-term treatments which have its own advantages and disadvantages. If there are no any contradictions for its use, radioactive iodine is a suitable treatment for the patients who are aguish and the relapse of the disease is less than the other methods of treatment.

One of the most common side effects of radioactive iodine in treating grave's disease is the intensification of ophthalmopathy.

In one year follow up, 18% of our patients had hypothyroid and radioactive iodine causes a significant decrease in the size of thyroid gland.

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