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A Prospective Study of Thyrotoxicosis Clinical Presentation and Etiopathogenesis.

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ABSTRACT

Background: Thyrotoxicosis denotes the clinical syndrome that results from tissue exposure to excess circulating free thyroid hormones e thyroxine (3,5,30 ,50 -tetraiodo-L-thyronine; T4) and/or triiodothyronine (3,5,30 -triiodo-L-thyronine; T3). Aim: To study the clinical presentation and etiopathogenesis of thyrotoxicosis. **Methods:** Thyroid profile, x-ray neck and ECG were taken for the cases. Radio-Isotope study was not done since facilities are not available in our hospital. Surgery was the modality of treatment offered to all patients. **Results:** Most of the patients who were diagnosed to have thyrotoxicosis were in the age group 31-45 years. The incidence of thyrotoxicosis in females was high and the male. All the patients had a goiter. The most significant clinical features were palpitation, weight loss, diarrhea, sleep disturbances, excitability and heat intolerances in the order of frequency. **Conclusion:** From the evidence it is clear that after adequate control of toxicity with anti-thyroid drugs, surgery is the modality of treatment that can be safely offered to patients with thyrotoxicosis.

Keywords: thyrotoxicosis, hyperthyroidism, Graves' disease.

INTRODUCTION

Thyrotoxicosis is a disorder of excess thyroid hormone, whereas the term hyperthyroidism specifically describes increased thyroid hormone synthesis and secretion. The tissue effects of high concentrations of thyroid hormones have many clinical manifestations. Two main hormones are synthesized and released by the thyroid: thyroxine (T4) and triiodothyronine (T3). T4 is a prohormone and is present in higher concentrations than T3, whereas T3 is biologically active through interaction with specific nuclear receptors that are present in nearly all tissues. T3 regulates energy production and metabolic rate and has profound effects on cardiac, hepatic, and neuromuscular function, as well as on fetal and postnatal growth and development. Thyrotoxicosis can be associated with hyperthyroidism or can also occur in the absence of increased thyroid hormone secretion. The most common cause of thyrotoxicosis is Graves' disease, in which autoantibodies bind to and stimulate the thyrotropin (also called thyroid stimulating hormone [TSH]) receptors found on the surface of thyroid follicular cells, which results in excess production of T3 and T4. The next most common cause is autonomous overproduction of thyroid hormones by one (solitary toxic adenoma) or more (toxic multinodular goitre) nodules within the thyroid. The frequency of these causes varies with iodine intake. Graves' hyperthyroidism accounts for about 80% of cases in areas of adequate iodine intake, whereas toxic nodular hyperthyroidism is accountable for 50% of cases in areas of low iodine intake, the latter showing the natural history of goitre development, growth of new nodules, and development of thyroid autonomy over time. Iodine fortification in areas of iodine deficiency results in a temporary increase in incidence of thyrotoxicosis of all types, which shows the complex relation between iodine status and thyroid autonomy.

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AIM

To study the clinical presentation and etiopathogenesis of thyrotoxicosis.

MATERIALS AND METHODS

This is a prospective study of randomly selected patients who presented with hyperthyroid symptoms, of toxic goiter who were diagnosed and treated at the

Department of General surgery TVMCH during the period of June 2007 to November 2009. Each patients symptoms and signs were entered in proforma with detailed clinical examination in relation to thyroid. All the patients were subjected to basic investigations like complete haemogram, Blood – Urea, sugar, creatinine, chest x-ray. Thyroid profile, x-ray neck and ECG were taken for the cases. Radio-Isotope study was not done since facilities are not available in our hospital. Surgery was the modality of treatment offered to all patients. Out of 50 cases surgery was done for only 45 cases and for the remaining 5 cases surgery was deferred due to various reasons and these patients were treated with Anti-thyroid drugs only.The 45 patients who were planned for surgery were put on anti-thyroid drugs as part of pre-op preparations to euthyroid state and to prevent thyrotoxic crisis. Surgery in the form of subtotal or near-total or total thyroidectomy was done. All operated specimen was sent for Histopathological Examination and analyzed.Post-op complications were analyzed and the patients were regularly followed up. The patients in whom surgery was deferred were treated with anti-thyroid drugs. Total T4 level after 3 months after surgery (for 45 patients) and total T4 level after 3 months after medical therapy (for 5 patients) were measured and analyzed.

RESULTS

Patients were included in this study; most of the patients who were diagnosed to have thyrotoxicosis were in the age group 31-45 years. Most of the patients who presented with Graves' disease were in the age group of 15-30 years. Most of the cases with toxic Multinodular goiter were in the age group of 31-45 years. In our study the incidence of thyrotoxicosis in females was high and the male: female ratio in our study was 1:9. There was no familial incidence in our study. Most of the patients had toxic multinodular goiter 35 patients and none of our cases included in the study had a solitary toxic nodule. All the patients had a goiter. The most significant clinical features were palpitation, weight loss, diarrhea, sleep disturbances, excitability and heat intolerances in the order of frequency. With regard to pulse rate, 60% of cases had severe toxicity 3rd degree with a pulse rate of >110/mt. TSH, Total T4, total T3 level estimation was done for all cases. In all cases, the TSH was reduced, T4 and T3were raised confirming the Hyperthyroid state and indicating the severity of the disease. T4 estimation repeated for all cases 3 months after therapy (both surgery and drugs). All the patients in whom surgery was planned were given anti-thyroid drugs and taken up for surgery after adequate control of toxicity. 33 cases of subtotal, 8 near total and 4 total thyroidectomies were done.This prevented the complication of thyroid storm in the per-operative and in the post-operative period. After giving anti-thyroid medication, the euthyroid state was attained after an average of 3-4 weeks with a minimum of 2 weeks and a maximum of 8 weeks. During surgery and in the post-op period the complications were encountered and are summarized, 2 patients have developed Hypoparathyroidism which manifested as TetanyCarpo-pedal spasm, Positive Chvostek's sign, Positive Trousseau's sign, One patient developed symptom on the 2nd day, and other on the 3rd day.

Table 1 Age incidence

S. No	Age group	No of patients	Percentage
1	16-30	14	28%
2	31-45	28	56%
3	46-60	8	16%

Table 2: Sex incidence

S. No	Sex	No of patients	Percentage
1	Male	5	10%
2	Female	45	90%

Table 3: Clinical presentation

S no	Type of goiter	No of patients	Percentage
1	Primary – Diffuse toxic goiter	15	30%
2	Secondary – Toxic MNG	35	70%

Table 4: Clinical feature

S No	Clinical features	No of patients	Percentage
1	Goiter	All	100%
2	Tremor	19	38%
3	Palpitation	35	70%
4	Heat intolerance	21	42%
5	Excitability	20	40%
6	Sleep disturbances	30	60%
7	Weight loss	32	64%
8	Diarrhea	32	64%
9	Muscle weakness	19	38%
10	Menstrual abnormalities	3	6%
11	Ophthalmopathy	11	22%
12	Bruit	5	10%

Table 5: Grade of toxicity

S no	Grade	Range	No of patients	Percentage
1	I	<90	4	8%
2	II	90-110	16	32%
3	III	>110	30	60%

All the cases were followed up in the post-operative period until the study period. It was noted that none of our patients had recurrent thyrotoxicosis and there was no mortality with a little morbidity. The patients who underwent total thyroidectomy were given thyroxin replacement in the form of Eltroxin tablets in a dose of 0.1 mg/day. The histopathology of the operated specimen was studied and there was evidence of malignancy in HPE of an operated specimen of two patients; Hurthle cell carcinoma and papillary carcinoma thyroid. The mean T4 level for patients treated with surgery and anti-thyroid

drugs was analyzed 3 months after therapy. The T4 level in the patients treated with surgery has decreased significantly to a normal level (or) to just below the normal level.But in cases treated with anti-thyroid drugs the T4 level decreased to an average level of 12-14 ηu/ml which is just above the normal level.Out of 5 patients treated with anti-thyroid drugs. Only one case came for routine follow up and the other 4 patients did not turn up after 3 months. And the significance of drug therapy in them could not be assessed properly.From the available data in general it can be stated that surgery is the appropriate form of treatment that can be safely offered to patients with thyrotoxicosis in our set up. Since patients do not come for routine and regular follow up.There was no incidence of thyroid storm or Respiratory distress or recurrent thyrotoxicosis. All the patients are living normally without any symptoms.

DISCUSSION

The variety of presentations of Graves' disease has been well documented in the literature. Fatigue can be a presenting feature of hyperthyroidism, and was seen in several of the study patients. MornexandOrgiazzi' attribute this complaint to neuromuscular manifestations related to hyperthyroidism. It is also thought that in some cases, fatigue may be related to thyrotoxic myopathy or thyrotoxic periodic paralysis.[5] Another common complaint in these cases was nervousness. This complaint is welldocumented,[6] and may be related to several systems, including the central nervous, muscular, and cardiovascular systems. Nervousness may also be the result of tachycardia and tremor.[7] Mcgaffee and Lippman,[4] suggest that" catecholamines and thyroid hormone interact to produce anxiety and hyper-alertness. An increase in in thyroid hormone induces further overproduction of catecholamines. Also, catecholamine receptors are sensitized by T3 and T4."The patients in this study presented with gastrointestinal complaints such as anorexia, nausea, vomiting, abdominal pain, and weight loss. Abdominal pain can be a predominant symptom, although it is not common.the8 Dreyfus' described a similar case, where the patient presented with epigastric pain and vomiting with their solution of such complaints within 36 hours after initiating therapy.[9] Rosenthal et a1,[6] described seven cases of thyrotoxic vomiting. It has been proposed that the vomiting associated with thyrotoxicosis is mediated through the action of thyroid hormone on the chemoreceptor trigger zone. Others have proposed that hypomagnesemia may be responsible for the vomiting.[10]

CONCLUSION

From the evidence it is clear that after adequate control of toxicity with anti-thyroid drugs, surgery is the modality of treatment that can be safely offered to patients with thyrotoxicosis. This present study confirms the observation made by the reputed authors and emphasizes the importance of perfect and sufficient pre-operative preparation, meticulous surgical technique, detailed knowledge about the anatomy of the thyroid, parathyroid and associated nerves to assure complete remissions with negligible morbidity and nil mortality.

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