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Clinical profile of patients with multi nodular goiter

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Abstract
The thyroid gland maintains the level of metabolism in the tissues that is optimal for their normal function. Thyroid hormones stimulate the 0_2 consumption of most of the cells in the body, help regulate lipid and carbohydrate metabolism, and are necessary for normal growth and maturation. The thyroid gland is not essential for life, but its absence causes mental and physical slowing, poor resistance to cold, and, in children, mental retardation and dwarfism. This is a randomized prospective clinical study of multinodular goitre patients admitted in attached to Medical Collage. A total number of 50 cases studied in a span of 24 months. Complete clinical examination, and necessary laboratory investigations were performed. Movement with deglutition was present in all patients l(100 percent), multiple nodules in both lobes in 30 cases (60 percent), nodules confined to left lobe in 7 cases (14 percent), right lobe was seen in 13 cases (26 percent) was seen.

Keywords: Multi nodular goiter, TSH secretion, TRH

Introduction
Thyroid gland mainly develops from the thyroglossal duct. Parafollicular cells are derived from the caudal pharyngeal complex (derived from 4th and 5th pharyngeal pouches) separate by midline swelling called the tuberculum impar. Immediately behind the tuberculum, the epithelium of the floor of the pharynx shows a thickening in the midline. This region is soon depressed below the surface to form a diverticulum called the thyroglossal duct.
The site of origin of the diverticulum is now seen as a depression called the foramen caecum. The diverticulum grows down in the midline into the neck. Its tip soon bifurcates. Proliferation of the cells of this bifid end gives rise to the lobes of the thyroid gland. This duct later becomes solid and finally disappears. With further development, the thyroid gland descends in front of the hyoid bone and the laryngeal cartilages. It reaches its final position in front of the trachea in the 7th week. By then, it has acquired a small median isthmus and two lateral lobes. The thyroid begins: functioning approximately at the end of the 3r d month, at which time the first follicles containing colloid become visible. Follicular cells produce the colloid that serves as a source of thyroxine and triiodothyronine. Parafollicular or C cells derived from the ultimobranchial body serve as a source of calcitonin. [1]
The thyroid gland maintains the level of metabolism in the tissues that is optimal for their normal function. Thyroid hormones stimulate the 0_2 consumption of most of the cells in the body, help regulate lipid and carbohydrate metabolism, and are necessary for normal growth and maturation. The thyroid gland is not essential for life, but its absence causes mental and physical slowing, poor resistance to cold, and, in children, mental retardation and dwarfism. Conversely, excess thyroid secretion leads to body wasting, nervousness, tachycardia, tremor, and excess heat production. The thyroid gland also secretes calcitonin, a calcium- lowering hormone. [2]
Thyroid function is regulated primarily by variations in the circulating level of pituitary TSH. TSH secretion is increased by the hypophysiotropic hormone TRH and inhibited in a negative feedback fashion by circulating free T_4 and T_3.
Human TSH is a glycoprotein that contains 211 amino acid residues, hexoses, hexosamines and sialic acid. When TSH is administered, thyroid function is stimulated. Whenever TSH stimulation is prolonged, the thyroid becomes detectably enlarged. Enlargement of the thyroid is called goitre. The negative feedback effect of thyroid hormones on TSH secretion is exerted in Part at the hypothalamic level, but it is also due in large part to an action on pituitary, since T_4

and T_3 block the increase in TSH secretion produced by TRH. Infusion of T_4 as well as T3 reduces the circulating level of TSH, which declines measurably within one hour. World-wide the most frequent single cause of endemic Multinodular Goitre is still iodine deficiency. [3]

In areas where the iodine supply is scarce, a TSH mediated compensatory mechanism is set into motion. As a consequence the thyroid gland diffusely enlarges and as time passes by it gradually becomes nodular.[4] Iodine deficiency is not only the cause of endemic goitre because a high prevalence of goitre has been reported from areas where iodine supply is abundant and because Multinodular Goitre continues to be a highly prevalent disorder in areas such as Switzerland, where iodine deficiency has long been eradicated.

The foregoing section on pathogenesis should make it clear that non endemic nodular goitre, are the late results of intrinsic disorders of intracellular growth control mechanism, just as in other clonal and polyclonal benign tumors.

Whereas thyroid stimulating immunoglobulins cause the goitre of graves' disease, specific Growth stimulating immunoglobulin's are considered by some authors to be a causative factor in a fraction of nodular goitres. [5]

Methodology

This is a randomized prospective clinical study of multinodular goitre patients admitted in attached to Medical Collage. A total number of 50 cases studied in a span of 24 months. Complete clinical examination, and necessary laboratory investigations were performed.

Inclusion criteria

Patients with enlargement of thyroid gland, with more than one nodule palpable or enlarged thyroid gland with nodular surface. Both toxic and non-toxic multinodular goitres were included in the study.

Exclusion criteria

Diffuse hyperplastic goitre, Solitary nodule of thyroid, Thyroid enlargeme nt with the clinical features suggestive of malignancy and multinodular goitre patients not undergoing surgery were excluded. The pre- operative treatment in most cases consisted of supportive treatment to control of toxicity in cases of toxic multinodular goitre. Patients operated after getting medical fitness for surgery. The operated specimen was sent for histopathologic examination in all cases. Movement of vocal cords were noted at the end of the operation in every case.

Results

In the present study the maximum age recorded was 75 years and minimum age recorded was 19 years with the mean age 36.36 years. Highest incidence was observed in the age group 31- 40 years (36 percent)

Table 1: Age Distribution

Age in Years	Number of Total	Percentage
0- 10	0	0
11- 20	4	8
21- 30	13	26
31- 40	18	36
41- 50	10	20
51- 60	3	6
60 and above	2	4
Total	50	100

Table 2: Sex Distribution

Sex	Number of Cases	Percentage
Female	47	94
Male	3	6
Total	50	100

In the present study, out of 50 cases, 47 were females and 3 were males, with a female to male ratio 15.7:1

Table 3: Age and Sex Distribution

Age in Years	Males	Females	Total Number of Cases	Percentage
0- 10	0	0	0	0
11- 20	1	3	4	8
21 -30	0	13	13	26
31 -40	1	17	18	36
41 -50	1	9	10	20
51 -60	0	3	3	6
60 and above	0	2	2	4
Total	3	47.	50	100

Table 4: Symptomatology

Symptoms	Number of Cases	Percentage
Swelling infront of neck	50	100
Pain and discomfort	10	20
Palpitation	5	10
Dysphagia	1	2
Dyspnoea	1	2
Increased sweating	4	8
Increased appetite	3	6
Weight loss	3	6

All patients were presented with swelling infront of the neck (100 percent). Other symptoms were Pain and discomfort in 10 cases (20 percent), Palpitation in 5 cases (10 percent), Dysphagia in 1 cases (2 percent), Dyspnoea in 1 cases (2 percent), increased sweating in 4 cases (8 percent), increased appetite in 3 cases (6 percent) and Weight loss in 3 case (6 percent).

Table 5: Physical Signs

Physical Signs	Number of	Percentage
Mobility with deglutition	50	100
Left lobe enlargement	7	14
Right lobe enlargement	13	26
Both lobe enlargement	30	60

Movement with deglutition was present in a ll patients (100 percent), multiple nodules in both lobes in 30 cases (60 percent), nodules confined to left lobe in 7 cases (14 percent), right lobe was seen in 13 cases (26 percent) was seen.

Discussion

In the present study, the maximum age recorded was 75 years and a minimum of 19 years, out of 50 cases 18 belong to age group 31- 40 (36%) years. maximum distribution was observed in 3rd and 4th decade and least was seen in 7th decade onwards.

In the study conducted by Ahuja majority of cases belong to the 3rd and 4th decades, least was in the 7th decade. Kapoor MM reported that out of 226 cases. The majority 145 (64%) cases were in the age group of 21- 40 years with maximum distribution in the third decade and least in the 7th decade, 12 (5.3%) cases. The present study is comparable to the above studies.

The MNG is common in 3rd - 4th decades the reason being more TSH fluctuation noted during adolescence and in reproductive age group. It was observed in the current study out of 50 cases 47 (94%) were females and 3 (6%) were males with a sex ratio of female to male is 15.7:1. Nygaard B[6] reported that out of 69 cases, 62 cases (89.9%) were females and 7 cases (10%) were males with sex ratio 8.8: 1. Study by Antonio Alfonso[7] showed a female to male ratio of 7: 1. In the study conducted by Ahuja, out of 205 cases 160 (78.1%) were females and (21.9%) were males with a sex ratio of 3.5: 1. In all above studies there is a female preponderance. The result of the recent study is comparable to the above studies. Almost all the thyroid related disorders are common in women and MNG is not an exception, the reason being more TSH fluctuation seen in women during adolescence, pregnancy, child birth and so on.

All patients were presented with swelling infront of the neck (100 percent). Other symptoms were Pain and discomfort in 10 cases (20 percent), Palpitation in 5 cases (10 percent), Dysphagia in 1 cases (2 percent), Dyspnoea in 1 cases (2 percent), Increased sweating in 4 cases (8 percent), Increased appetite in 3 cases (6 percent) and Weight loss in 3 cases (6 percent).

In ma jority of patient the duration of swelling prior to presentation was 1- 3 months in 11 (36.67%) cases. In 5 (16.67%) patients presented with duration more than 5 years.

Involvement of both the lobes was seen in majority of patients 30 (60%). Predominant right lobe involvement was seen in 13 cases (26%). Left lobe involvement was seen in only 7 (14%) case.

Grossly, the thyroid is enlarged and its shape is d istorted, one lobe being frequently larger than the other. The thyroid capsule may be stretched but intact. On cross section, multiple nodules are seen, some surrounded by a partial or complete capsule. Secondary changes in the form of hemorrhage, calcification and cystic degeneration are common. Microscopically, there is a wide range of appearances. Some nodules are composed of huge follicles lined by flattened epithelium, others are extremely cellular and hyperplastic and still others are composed predominantly or exclusively of Hurthle Cells. Some of the dilated follicles have a conglomerate of small active follicles at one pole (so called Sanderson's polsters) others have papillary projections facing the lumen of cystic follicle, a feature that may lead to confusion with papillary carcinoma. [8]

It is not unusual to find, within a nodule predominantly composed of large dilated follicles, sharply outlined solid or micro follicular clusters of follicular cells. It has been suggested that nodular goiters grow by episodic replication of these clusters, which have been referred to as foci of secondary proliferation and which have been found to express immunohistochemical the P_{21} proto- oncogene product.

Rupture of follicles leads to a granulomatous reaction to the colloid, with appearance of histiocytes and foreign body type giant cells. Areas of fresh and old hemorrhage, cause fibrous trabeculation and foci of calcification are common. Occasionally, osseous metaplasia is seen. Greatly thickened vessels with calcified media may be present at the periphery. A variable number of chronic inflammatory cells are present in the stroma in many of the cases, indicating the co- existence of chronic thyroiditis. The larger their number, the higher the chances of postoperative hypothyroidism. The presence of the highly atypical nuclei in a case of nodular hyperplasia should raise the possibility of previous exposure to radioactive substances if present in the nodule themselves, and of dyshormogenic goitre if present between the nodules. It is not possible to predict on the basis of the morphologic appearance whether the patient has clinical or laboratory evidence of hyperthyroidism. [9]

Toxic multinodular goitres usually occur in individuals older than 50 years of age, who often have a prior history of a nontoxic multinodular goitre. Over several years, enough thyroid nodules become autonomous to cause hyperthyroidism. The presentation is often insidious in that hyperthyroidism may only become apparent when patients are placed on the low doses of thyroid hormone suppression for the goiter. Some patients have T_3 toxicosis, whereas other patients have apathetic hyperthyroidism, atrial fibrillation, or congestive heart failure. Hyperthyroidism can also be precipitated by iodide containing drugs such as contrast media and the anti-arrhythmic agent amiodarone.

An anterior cervical or retrosternal / intrathoracic space occupying mass is present. Symptoms and signs range from none (incidental finding) to varying degrees of pressure symptoms and signs: from a sensation of fullness to grotesque disfiguration with inspiratory stridor, disturbances in swallowing, superior vena cava obstruction (rarely), and Horner's syndrome (rarely) – caused by pressure on the trachea, esophagus, cervical veins, and sympathetic nerves, respectively. Hoarseness is a rare symptom, but when present, the possibility of thyroid malignancy should be contemplated. [10]

Conclusion

Patients with nontoxic multinodular goiter by definition do not have any symptoms or signs of thyroid dysfunction. However, many such goiters have a growth potential and, with that, the potential for increasing autonomy and hypersecretion of thyroid hormone. Because the condition is slowly evolving and most often seen in the elderly, the symptoms of hyperfunction are at variance with those seen in Graves ' disease.

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