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MULTINODULAR GOITER;

Frequency of malignancy

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ABSTRACT… Objective: The object of this study was to determine the frequency and type of thyroid carcinoma in Multi nodular goiter (MNG) after surgical resection on histopathological basis. **Introduction:** Multi nodular goiter (MNG) is one of the common presentations of various thyroid diseases. Thyroid nodules have been reported to be found in 4% to 7% of the population on neck palpation. Although in comparison to solitary nodule, the risk of malignancy in MNG is low but certain studies are showing significant risk. **Material and methods:** This prospective, observational study was carried out in the surgical unit I of Ghulam Mohammad Mahar Medical college hospital sukkur from 2007 to 2012. 94 cases with clinical diagnosis of MNG were analyzed during this period. All the patients were admitted through opd with routine investigations plus investigations specific to thyroid including thyroid profile, thyroid scan, FNAC of dominant nodule before being subjected to surgery. All FNACs were carried out at agha khan university hospital Karachi. Histopathology of operated specimen was the main criteria for malignancy. **Results:** Among the 94 cases which were included in this study, 9 (9.5%) cases containing foci of malignancy. Incidence of malignancy commonly occurs in females, papillary carcinoma is being the commonest entity. **Conclusions:** The incidence of malignancy in MNG in this study is 9.5% that is quite high. So people should be educated and encouraged to attend the thyroid clinics for proper evaluation and early diagnosis of Malignancy.

Key words: Multinodular goiter, carcinoma, histopathology

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INTRODUCTION

Enlargement of thyroid gland is a common problem. Its true incidence is unknown though it is endemic in the northern areas of Pakistan especially in Swat, Dir. and Chitral districts of Khyber Pakhtunkhwa and certain areas of Sindh province especially sukkur and ghotki . The most common cause of goiter formation is iodine deficiency. According to UNICEF (1998) report, 70% of the total population in Pakistan is at risk of iodine deficiency disorder. Other causes include heredity, neoplasia, inflammations, drugs and exposure to radiations.

Thyroid cancer is uncommon, with an estimated incidence in various parts of the world as 0.5 to 10 cases per 100,000 populations. It accounts roughly for about 0.5% of all cancers in men and 1.5% of all cancers in women[1]. The most common types of thyroid cancers are differentiated, with papillary carcinoma 70%, follicular carcinoma 12% and the follicular variant of the papillary carcinoma 6% of all the thyroid cancers[2]. It may present solitary nodule or as a dominant nodule in a multinodular goiter. In Pakistan, thyroid cancer accounts for 1.2% cases of all malignant tumors[3].

Multinodular goiter MNG is one of the common presentations of various thyroid diseases. Thyroid nodules have been reported to be founded in 4% to 7% of population on neck palpation and 30% to 50% population on ultrasonography[4,5,6]. MNG had been traditionally thought to be at low risk for malignancy as compared to solitary nodule of thyroid[7,8]. Various studies showing the incidence rate of carcinoma in MNG varies from 4% to 17%[9,10,11,12,13].

The management of solitary nodule of thyroid has been refined by FNAC, unlike MNG, in which nodule of carcinoma cannot be differentiated clinically and radiologically amidst other benign nodules[14,15].

The objective of this study was to assess the incidence of malignancy in MNG in surgically resected specimens.

MATERIALS AND METHODS

This prospective and observational study was carried out from January 2007-2012 in Surgical Unit I Ghulam Mohammad Mahar Medical College hospital, Sukkur. 94 patients with clinical diagnosis of MNG were analyzed. All these patients were admitted through OPD with all routine investigations plus investigation specific to thyroid including thyroid profile, thyroid scan, ultrasound neck, FNAC of dominant nodule before being subjected to surgery. All FNAC were carried out through agha khan university hospital Karachi. Histopathologies of operated specimen were the main criteria for malignancy. None of these patients had a history of irradiation of neck or family history of thyroid malignancy.

Most of patients were euthyroid in status. Patients with solitary thyroid nodule, recurrent goiter, proven thyroid malignancy and metastatic cervical lymphadenopathy with occult primary were excluded from this study.

All pre-operative, operative and postoperative findings were recorded in detail in standard format and the results were evaluated.

RESULTS

In this prospective study, 94 cases were included without any specific consideration to age, sex and ethnic groups. Out of 94 cases, 12(12.8%) were male and 82(87.2%) were female with M: F ratio 1:6.8. Majority of patients presented with MNG between 3rd to 4th decades (Table I). Most of patients presented with the history of swelling in front of neck, while dyspnea and dysphagia were the next more significant complaints (Table II). 2 patients were supposed to have a malignancy on clinical grounds, which was later on proved on paraffin section (Table IV). In this study not a single of goiter with retrosternal extension was noted.

Out of 94 cases 2 were presented with signs of thyrotoxicosis and rest with euthyroid status. Not a single patient manifested any evidence of hypothyroidism (Tables III, VI).

Age group	No. of patients	Male	Female
11-20 years	02	01	01
21-30 years	07	01	06
31-40 years	45	04	41
41-50 years	35	05	30
51-60 years	04	-	04
> 60	01	01	-
Total	94	12	82

Table-I. Age distribution

Complaints	No. of Pts.	%age
Thyroid swelling	94	100%
Dyspnoea (on lying down)	18	19.1%
Dysphagia	08	8.5%
Pain in swelling	02	2.1%
Palpitation	04	4.2%
Features of thyrotoxicosis	02	2.1%
Hoarseness of voice (unilateral cord paralysis)	02	2.1%

Table-II. Presenting complaints

Total no. of patients	94
Euthyroid	92 (97.9%)
Hyperthyroid	2 (2.1%)
Hypothyroid	-

Table-III. Thyroid status on clinical assessment

Total no. of cases	Malignancy suspected clinically	
	Male	Female
94	01	01

Table-IV. Clinical suspicion of malignancy

On thyroid scanning 2 patients presented with hot nodule while rest were having cold nodule (Table V). Hormonal assay elicited 2 cases with hyperthyroidism and rest were euthyroid. (Table VI). All patients were subjected to FNAC from dominant nodule. Out of 94 cases, 7 were diagnosed having malignant goiter and rest were benign. (Table VII).

No. of patients	94
Hot nodule	02
Cold nodule	92
Warm nodule	-

Table-V. Thyroid scanning

Total No. of patients	94
Euthyroid	92
Hyperthyroidism	02
Hypothyroidism	-

Table-VI. Hormonal assessment

Total No. of patients	94
Benign	87 (92.5%)
Malignant	7 (7.4%)

Table-VII. FNAC based histopathological results

Type of malignancy	No. of pts.	Age (years)	Male	Female
Papillary carcinoma	6 (66.7%)	30-50	1	5
Follicular carcinoma	2 (22.2%)	40-60	1	1
Anaplastic carcinoma	1 (11.1%)	72	1	-
Medullary carcinoma	-	-	-	-
Others	-	-	-	-
	9/94 (9.5%)	-	3 (33.3%)	6 (66.8%)

Table-VIII. Tissue histopathology with age & sex presentation

FNAC accuracy rate was 77.8%. On histopathological grounds, 9 cases were diagnosed having malignant goiter. Females are affected more commonly then males. Malignancy was noted more commonly in 3rd to 4th decade of life. In this study overall incidence of malignancy in MNG was 9.5% with M:F ratio 1:2. Papillary carcinoma is the most common variant. (Table VIII)

DISCUSSION

Multinodular goiter is defined as the palpation of multiple distinct nodules in the enlarged thyroid gland. The etiopathogenesis of MNG in not clear. The malignancy predominantly occurred in females, so hormonal influence may be considered to be the etiological factor for malignant changes in goiter. Majority of patients come from iodine deficient areas. Some patients presented with prolonged history of goiter. These are the etiological factors known to induce malignancy[16]. The presence of thyroid stimulating immunoglobulins have been suggested as the various causes[14].

Thyroid nodules have been reported in 4% to 7% of the population on neck palpation (the incidence increases with age) and in 30% to 50% of the population by ultrasonography[4,5,6]. It has been observed that 50.5% of the solitary nodules which are felt on palpation are actually a part of the multi-nodular goiter[4]. The appreciation of the nodules may be hampered by the

presence of a short and thick neck[4]. Even the experienced physicians may fail to detect the nodules when they are less than 1 cm in diameter[4,17].

In MNG, surgery is offered for cosmetics, the compressive symptoms, toxicity and for the suspicion of malignancy. A long standing and hitherto unresolved issue is whether MNG is significantly associated with malignancy MNG had been traditionally thought to be at a low risk for malignancy as compared to a solitary nodule thyroid[7,8,18]. However, various studies have shown that the risk is quite high in MNG also. A study which was conducted by Benzarti et al in Tunis found a 9.5% incidence of malignancy in MNG [19,20]. Prades et al from France, however, reported quite a high incidence i.e. 12.2%[19,21].

FOREIGN LITERATURE

1. The incidence of malignancy in MNG is 17%[9].
2. The risk of malignancy is lower in MNG than in solitary nodule with reported malignancy rate between 4-10%[22].
3. The frequency of carcinoma in MNG was 7.5% in patients older than 21 years and 11.5% under 21years [23].

LOCAL LITERATURE

1. Study conducted at Chandka Medical College Larkana, showing the incidence of malignancy in MNG is 7.7%[12].
2. Study conducted at liaquat Medical College Jamshoro showing the incidence of malignancy in MNG varies from 4-7%[24].
3. Incidence of malignancy in MNG was 11.9% in one of study conducted at Jinnah Post graduate Medical Centre, Karachi[13].

In our study ,the incidence of malignancy in MNG is 9.5%, which is comparable to local and international studies. Out of 94 cases 82 were females and 12 were males with M:F ratio was 1:6.8. There is predilection of MNG in females[25]. Majority of patients with MNG in our study were in the range between 30-53 years ,with maximum incidence in 3rd and 4th decade[12]. The maximum incidence of malignancy in this study was analyzed in age range of 30-50 years which is comparable to literature[26].

In this study, malignancy predominantly occurred in females, so hormonal influence may be considered to be the etiological factor for malignant changes in goiter. Majority of patients come from iodine deficient areas.

Two patients presented with thyrotoxicosis and rest were euthyroid. In two patients, malignancy was diagnosed on clinical grounds, which was confirmed later on histopathology. One patient with papillary carcinoma presented with secondaries in lung and parietal bones and other with anaplastic carcinoma. Both these cases presented with hoarseness of voices with unilateral cord paralysis. Rest of cases presented as occult carcinoma. FANC showed malignancy in 7 cases with accuracy rate of 77.7%, which is comparable to literature[27].

A thyroid nodule should be viewed with suspicion if it is seen as a dominant nodule in the MNG, which is hard, irregular, fixed and rapidly increasing, seen along with cervical lymphadenopathy, recurrent laryngeal nerve palsy, extremes of age and the male sex. A patient with a history of neck irradiation or a family history of thyroid carcinoma (TC) should make the suspicion strong[19]. High-frequency, real-time ultrasonography and fine-needle aspiration cytology (FNAC) are the indispensible tools which are used in the pre-operative evaluation of MNG for malignant foci. The important sonographic findings which are suggestive of malignancy in the thyroid nodules are micro-calcifications, irregular margins of the nodules, a complex echogenecity and smaller nodules[4]. It has been postulated that the thyroid cancers would have manifested with more overt signs and symptoms of local invasion or metastasis by the time they had

reached significant size[4]. FNAC is a fast and inexpensive investigation which can be done to obtain cellular samples[4]. A series of reviews have reaffirmed its importance in the assessment of the thyroid nodules. However, a negative FNAC report does not exclude with certainty the possibility of a carcinoma, especially in MNG, where the error in sampling the right area is greater[9,10]. FNAC of a suspicious nodule under USG guidance s of great help[8,18]. Thyroid carcinomas account for 1% of all the malignancies and they are the most common endocrine tumors[19]. The incidence of TC varies considerably in different regions of the world. Globally, the incidence of TC has increased by up to five-fold during the past 60 years[7,28].

The tumors are rare in children and their frequency increases with age. Overall, females have a higher incidence of TC[19]. Ionizing radiation, iodine deficiency and other factors have been attributed for the increase in TC, but these findings are inconsistent[7]. Hormonal factors, lactation suppressant drugs and fertility medications have been implicated for the high incidence of TC in females[19]. However, recent studies have reported no significant risk associated with the use of hormone replacement therapy or fertility drugs[19,29,30]. It also has been proposed that the availability of better and more sensitive diagnostic tools may detect early malignancy[7,31].

Recent studies have suggested that the micro-carcinomas classically progress to a clinically evident disease if they are left untreated[31,32]. The treatment of papillary micro-carcinoma should be similar to that of papillary thyroid cancer[30,31].

CONCLUSIONS

Incidence of malignancy in MNG is significantly high and commonly occurs in females, papillary carcinoma being the most common variant. Incidence of malignancy is more common in iodine deficient areas, particularly with prolonged history of goiter and huge goiter. So iodine deficiency seems to be one of the major factors inducing malignancy. This needs to be further evaluated. Females are more prone to have malignancy then males probably because of hormonal influence, this also needs further evaluation. Peoples should be educated and encouraged to attend the thyroid clinics for proper evaluation and early diagnosis.

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everything is your fault.

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