

## **Primary Care Evaluation of Thyroid Disease: Which Clinical Group Needs Urgent Surgical Referral?**

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**Objective:** To identify the clinical groups of patients with thyroid disorders which need urgent surgical referral from the Primary Care Clinic.

**Methods:** The case records of all patients with various thyroid diseases referred from the Primary Care Clinic to the Surgical Clinics of King Khalid University Hospital, from January 1990 to December 1997 were retrospectively reviewed. Patients' characteristics, clinical findings and the final histological results were analyzed.

**Results:** Four hundred and twenty-eight patients comprised this study group, which included 390 female and 38 male subjects with a mean age of 41.7 (range, 12-70) years. One hundred and seventy-two (40%) patients were reported to have solitary thyroid nodule, 132 (31%) diffuse thyroid goiter and 124 (29%) multi-nodular goiter. The overall incidence of malignancy in all groups was 11.2%, solitary thyroid nodule showed the highest (14%) and diffuse goiter the lowest (6.1%) incidence of malignant tumors in this series.

**Conclusion:** The significant incidence of malignant lesions in solitary thyroid nodules demands urgent surgical consultation by the primary care physician. Diffuse goiter can be managed in Primary Care Clinic unless associated with gross thyroid dysfunction or malignancy.

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A wide spectrum of thyroid ailments manifests diagnostic confusion, which can lead to unnecessary surgical interventions. Majority of the thyroid lesions are benign; thyroid nodules being the commonest disorder presenting to the endocrine surgeon<sup>1</sup>. Thyroid cancer is rare, approximately 4 per 100,000 populations per annum, constituting only 1.0% of all malignancies, and 0.5% of all deaths<sup>2-4</sup>. Fewer than 10% of solitary thyroid nodules, defined as a discrete palpable swelling within an apparently normal gland, are malignant<sup>5,6</sup>. At the same time, it is occasionally difficult to clinically exclude malignancy in an enlarged gland. It is mandatory for the primary care physician to apply a rational, step-wise approach to various thyroid disorders.

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The present study is an attempt to formulate an evaluation strategy, which may help to distinguish those patients with thyroid illnesses who need an urgent surgical referral.

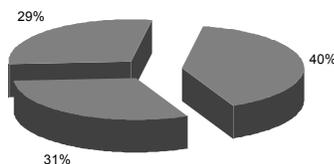
## METHODS

This retrospective study included the consecutive patients with different thyroid disorders referred from the primary care clinic (PCC) to the surgical clinics of King Khalid University Hospital from January 1990 to December 1997. The case records of the patients were reviewed for patients' characteristics, clinical findings and the histological results.

Epistat Package was used for statistical analysis whereby chi-square test was employed for the statistical comparison of the histological results. P value of  $< 0.05$  was considered significant.

## RESULTS

The medical records of 512 patients with thyroid disorders were reviewed. Seventy-three cases did not have any surgical intervention while the histological results of 11 patients could not be traced; therefore, these two groups were excluded from this study. Out of the remaining 428 patients (study population); there were 390 females and 38 males with a mean age of 41.7 (range, 12-70) years. The patients were divided into 3 clinical groups: solitary thyroid nodule (STN), multi nodular goiter (MNG), and diffuse goiter. STN was found to be the most frequent thyroid diagnosis reported in 172 (40%) followed by diffuse goiter observed in 132 (31.1%) (Fig 1). The incidence of malignant lesions was highest in STN group (14%) and lowest in the diffuse variety (6.1%) with an overall 11.2% incidence of malignancy (Table 1). Thirty-six patients had papillary carcinoma, 6 follicular carcinoma, 2 anaplastic carcinoma and 4 cases were reported to have lymphoma of the thyroid gland as illustrated in Table 2.



*Figure 1: Distribution of Various Thyroid Disorders (n=428)*

**Table 1: Final histological diagnosis of patients with thyroid disorders (n=428)**

Clinical Group	Histological Diagnosis			
	Malignant n (%)	Nodular hyperplasia n (%)	Adenoma n (%)	Others (grave's disease, cysts, thyroiditis...etc.) n (%)
STN* (172)	24 (14)	63 (36.6)	53 (30.8)	32 (18.6)#
DIFFUSE (132)	8 (6.1)	58 (43.9)	-	66 (55)+
MNG** (124)	16 (13)	91 (73.3)	10 (8)	7 (5.6)@

*STN\** Solitary thyroid nodule

*MNG\*\** Multi nodular goiter

# *P* value 0.04 significant

+ *P* value 0.9 not significant

@ *P* value 0.33 not significant

*NB* In diffuse type 38 cases presented with thyroiditis and 16 Grave's disease.

**Table 2: Distribution of malignant thyroid lesions (n=48)**

Clinical Group	Malignant n (%)	Papillary Carcinoma n (%)	Follicular Carcinoma n (%)	Anaplastic Carcinoma n (%)	Lymphoma n (%)
STN*	24 (50)	22 (45.8)	1 (2)	1 (2)	-
MNG**	16 (33.3)	10 (20.8)	3 (6.2)	-	3 (6.2)
DIFFUSE	8 (16.7)	4 (8.3)	2 (4.1)	1 (2)	1 (2)

*STN\** Solitary thyroid nodule

*MNG\*\** Multi nodular goiter

## DISCUSSION

Thyroid disorders are four times more common in women than in men and occur more often in people who live in geographic areas with iodine deficiency<sup>7</sup>. A solitary thyroid nodule in a child under 14 years of age has 50% likelihood of malignancy and similarly the malignancy

rate in a previously irradiated thyroid gland ranges from 20 to 25%<sup>8,9</sup>. A positive family history of thyroid or other endocrine disease should alert the clinician to the possibility of medullary thyroid cancer, which constitutes 7% of all thyroid malignancies manifesting as part of multiple endocrine neoplasia (MEN-II A or MEN-II B) syndromes<sup>10</sup>. The key features of clinical evaluation include size and location of the abnormality, the degree of firmness of the nodule if present, palpable cervical lymph nodes, vocal cord paresis or paralysis and tachycardia<sup>11</sup>. The frequency of palpable thyroid lesions varies in different parts of the world: 2.1-4.2% in United States, 5.1-6.5% in Europe and 1.3-3.9% in Japan<sup>12-14</sup>.

At least 50% of the clinically solitary nodules turn out to be part of MNG often with subtle micronodularity in the opposite lobe<sup>15</sup>. The consistency of a palpable thyroid lesion may be deceptive: not all cancers are hard as some papillary carcinomas are cystic and some follicular tumors are hemorrhagic and soft. Conversely, benign cold nodules may be hard due to calcification. The biochemical evaluation of thyroid function includes free thyroxine (FT4), free tri-iodothyronine (FT3) and thyroid stimulating hormone (TSH) assays. Attention should be focused to the log relationship between FT4 and TSH.

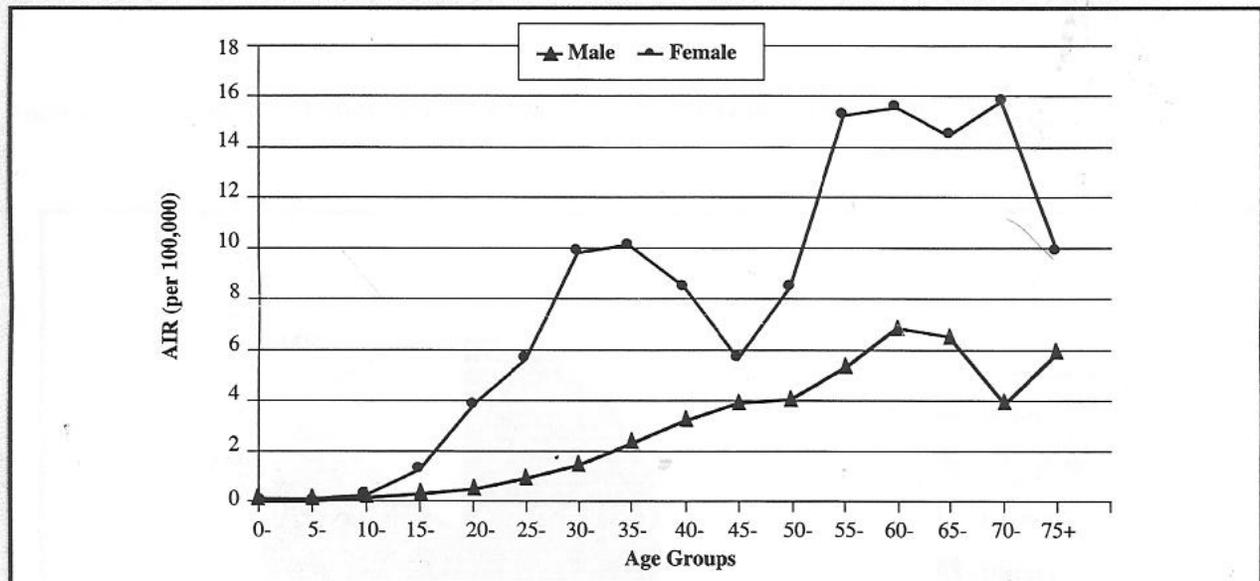


Figure 2: Average age specific incidence rate (AIR) for Thyroid Cancer in Saudi, 1997- 1998<sup>21</sup>

If FT4 levels decrease by 50%, TSH increases by 100%<sup>16</sup>. Thyroglobulin measurement adds little to the clinical judgment but is of tremendous value for monitoring patients after total thyroidectomy for malignant tumors and on thyroxine replacement. Ultrasonography of the thyroid gland is most useful in the assessment of the contralateral lobe in cases with solitary nodules or unilateral disease, in facilitating fine needle aspiration biopsy (FNAB) of impalpable nodules, and as a monitoring tool for those with MNG that does not warrant surgery<sup>17</sup>. Computed tomography (CT) is indicated selectively in patients with massive retrosternal, clinically malignant goiter or in planning median sternotomy for massive intra thoracic goiters. A particularly important part of the diagnostic laboratory evaluation is the use of radioisotope scan. Thyroid cancer occurs almost exclusively in hypofunctioning (cold) nodules that fail to trap iodine, whereas they rarely, if ever occur in autonomous

hyperfunctioning (hot) nodules<sup>18</sup>. However, like the thyroid function tests, the thyroid scan cannot accurately differentiate benign from malignant disease<sup>19</sup>. Most of the centers utilizing FNAB as a principal tool in the evaluation of thyroid lesions have achieved 35-75% reduction in the number of patients requiring surgery<sup>20</sup>, a rising malignancy yield at thyroidectomy, and a reduction in the thyroid nodule management cost by as much as 25%<sup>19,20</sup>.

The present study reported 14% incidence of malignancy in STN, which is significantly higher than 6.1% demonstrated in diffuse goiter ( $P < 0.05$ ). Such an observation necessitates an urgent surgical review of patients with STN as well as cytological analysis by FNAB in PCC to avoid delay in decision-making. A substantial rise in the incidence of thyroid cancer in Saudi Arabia reaffirms this recommendation (Fig 2)<sup>21</sup>. In the current series, the incidence of malignant lesions in STN was found to be strikingly higher than the figures published by Kuma et al (4.5%) and Mazzaferri (5-10%)<sup>22,23</sup>. In euthyroid patients with a nodule, FNAB should be performed, and radionuclide scan reserved for those with indeterminate cytology or thyrotoxicosis<sup>24</sup>. Suspicious cytology warrants surgical removal of the involved thyroid lobe. Controversies still prevail regarding the ideal management of MNG and diffuse goiters. The proponents of levothyroxine therapy maintain that such treatment serves as a suppresser of thyrotropin, which should, therefore, reduce the size of the gland<sup>25</sup>. On the other hand, Reverter et al found that suppresser doses of levothyroxine were ineffective in reducing the size of thyroid nodules or goiter itself<sup>26</sup>. This helps us to infer that the patients with MNG and diffuse goiter can be observed or initially treated with levothyroxine at PCC.

## CONCLUSION

**The patients with a family history of thyroid cancer or head/neck irradiation in the past, extremes of age (< 20 and > 65 years) and those with clinical diagnosis of STN in the primary care clinic need urgent surgical consultation. Diffuse goiter can be treated and followed up in PCC unless thyroid dysfunction or malignancy supervenes. This strategy would help identify the high risk group and minimize the delay in the appropriate management.**

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