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*Original Article*

# Frequency of Malignancy in Solitary Thyroid Nodule and Multi-nodular Goitre

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**Abstract**

*This cross sectional study with purposive sampling based on 50 cases of solitary thyroid nodule and multi-nodular goitre for operation in department of Otolaryngology and Head-Neck surgery of SSMC & Mitford Hospital, Dhaka and Dhaka Medical college, Dhaka during January 2009 to December 2009. Objectives of this study to find out relative frequency of malignancy in solitary thyroid nodule and multi-nodular goitre (by histopathology). Each case was studied by history taking, physical examination and relevant investigations. In this series, male to female ratio was 1:7. Mean age of the patients of nodular goitre was 36.5+12.33 years and the highest number of patients were found in age group 31-40 years.*

*After operation, histopatholoical report analysis was done and found that nodular colloidal goitre was 52%, follicular adenoma was 24% and auto-immune thyroiditis was 6%. Among the malignancies papillary carcinoma was 66.66%, follicular carcinoma was 22.22% and anaplastic carcinoma was 11.11%. The relative frequency of malignancy in solitary thyroid nodule was 28% and in multi-nodular goitre was 8%. As there is a chance of malignancy is high so it should get serious medical attention.*

***Key words:*** *Thyroid nodule, Solitary thyroid nodule, Multi-nodular goitre, Malignancy, Histopathbology.*

## Introduction

Thyroid nodules are common in clinical practice. There may be solitary within a normal thyroid gland or dominant within a multi-nodular goitre .The incidence of thyroid nodule has been on rise in recent decades mainly due to the wider use of neck imaging[1].

Nodules are usually multiple, forming a multi-nodular goitre. Occationally, only one macroscopic nodule is found, but microscopic changes will be present throughout the gland, this is one form of clinically solitary nodule Nodules appear early in endemic goitre and later (between 20 and 30 years) in sporadic goitre[2].

Palpable thyroid nodules occur in 4-7% of the population but nodules found incidentally on ultrasonography suggest a prevalence of

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19-67%. The majority of the thyroid nodules are asymptomatic. Because about *5%* of all palpable nodules are found to be malignant, the main objective of evaluating thyroid nodules is to exclude malignancy[3].

Iodine deficiency is the main cause of goitre development in Bangladesh. In Bangladesh, goitre is prevalent in bank of river Jamuna, northern part of the country and also hilly areas in Sylhet and Chittagong. In clinical practice, we consider nodular goitre either with solitary nodule or multiple nodules in different stages of development[4].

Nodules in the thyroid gland are important for their malignant potential. It is the highest among the cancer affecting endocrine glands. Cancer of the thyroid gland occurs at earlier ages in most parts of the world. It is commonest between 20-40 years of age[5].

Risk factors that increase the probability of malignancy of a thyroid nodule are age under 30 years or over 60 years, male sex (8% in male versus 4% in female), history of head neck irradiation in childhood and family history of medullary thyroid carcinoma or multiple endocrine neoplasia (MEN) type 2[1].

Early diagnosis helps in early treatment, results in good outcome. But late diagnosis indicates advanced stage of disease with unsatisfactory treatment and poor prognosis. Frequency of malignancy in thyroid nodules varies among different studies in our country & abroad. In our country, one of the study was found, the percentage of malignancy 21.44% & 8.1% in solitary nodule & multi-nodular goitre respectively[5]. Another study showed chance of malignancy 9.89%[6]. One of the study in abroad found, 5% of the thyroid nodules as malignant[7].

Purpose of this study was to find out the relative frequency of malignancy in solitary thyroid nodule and multi-nodular goitre.

## Methods

This cross-sectional comparative study was done in the department of Otolaryngology & Head-Neck surgery of Sir Salimullah Medical College Hospital and Dhaka Medical College Hospital during the calendar year 2009. 50 admitted cases of solitary thyroid nodules and multi nodular goiter matching the inclusion and exclusion criteria were included in this study.

## Results

**Table- I**

*Age distribuition in solitary and multi-nodular goitre, (n=50)*

| Age (years) | Solitary thyroidnodule | Multi-nodulargoitre | Total (%) |
|---|---|---|---|
| 11-20 | 5 | 2 | 7 (14%) |
| 21-30 | 3 | 2 | 5(10%) |
| 31-40 | 8 | 13 | 21(42%) |
| 41-50 | 7 | 5 | 12(24%) |
| 51-60 | 2 | 1 | 3 (6%) |
| 61-70 | 0 | 2 | 2 (4%) |
| Total | 25 | 25 | 50 (100%) |

**Table- II**

*Sex distribution in solitary and multi-nodular goitre, (n=50)*

| Sex | Solitary thyroidnodule | Multi-nodulargoitre | Total (%) |
|---|---|---|---|
| Male | 4 | 2 | 6 (12%) |
| Female | 21 | 23 | 44 (88%) |
| Total | 25 | 26 | 50(100%) |

**Table- III**

*Distribution of habitat of patients*

| Habitat | Solitary thyroidnodule | Multi-nodulargoitre | Total (%) |
|---|---|---|---|
| Urban | 6 | 5 | 11 (22%) |
| Rural | 19 | 20 | 39 (78%) |
| Total | 25 | 25 | 50 (100%) |

**Table- IV**

*Histopathological diagnosis*

| Diagnosis | Solitary thyroid nodule | Multi-nodular goitre | Total (%) |
|---|---|---|---|
| Multi-nodular colloid goitre | 0 | 15 | 15 (30%) |
| Single nodular colloid goitre | 11 | 0 | 11 (22%) |
| Follicular Adenoma | 7 | 5 | 12 (24%) |
| Papillary carcinoma | 6 | 0 | 6 (12%) |
| Follicular carcinoma | 1 | 1 | 2 (4%) |
| Medullary carcinoma | 0 | 1 | 1 (2%) |
| Anaplastic carcinoma | 0 | 1 | 1 (2%) |
| Auto immune thyroiditis | 0 | 3 | 3 (6%) |
| Total | 25 | 25 | 50 (100%) |

**Table- V**

*Frequency of malignancy in solitary thyroid nodule & multi-nodular goitre.*

| Types | Malignant | Non malignant | Total (%) | Relative frequency (%) |
|---|---|---|---|---|
| Solitary thyroid nodule | 7 | 18 | 25 (50%) | 28% |
| Multi-nodular goire | 2 | 23 | 25 (50%) | 8% |

$z = 2$ $p<0.05$

**Table-VI**

*Distribution of thyroid malignancy (n = 14)*

| Name of malignancy | Number of cases | | Percentage |
|---|---|---|---|
| | Solitary thyroid | Multi-nodular goitre | |
| Papillaruy carcinoma | 6 | 0 | 66.66% |
| Sollicular carcinoma | 1 | 1 | 22.22% |
| Anaplastic carcinoma | 0 | 1 | 11.11% |

## Discussion

In this study, 50 patients with thyroid swelling (solitary & multi-nodular goitre) were studied. Mean age of the patients of nodular goitre was 36.5±12.33 years and the highest frequency (42%) was in 31-40 years. Which correlated with study of Rahman. Nath, Sattar[5,8]. The youngest patient in this study was a girl of 15 years with a papillary carcinoma and the oldest patients was a lady of 70 years with medullary carcinoma. The youngest patient and oldest patients of this study both had been suffering from malignant thyroid disease, the extreme of ages show less incidence of thyroid disease but has a more chance to be malignant.

In this series, out of 50 patients, male were 6 (12%) and female were 44 (88%). Male female ratio was (1:7.31). This ratio was shown 1:5 by Rahman[5] (2000), I:4 by Welkar[3], 1:2.5 to 4.1 Zuberi[9]. This female preponderance is reflected in all studies including the present. The cause of high female to male ratio in this series can be explained by most of the patients are from non-endemic area. Here we may recall the finding of kilopatric et al who found a male to female ratio of 1: 14 in non endemic area, which was 1:1 in endemic area.

In this study the commonest occupational group was house wife (58%). It was due to the fact that thyroid disorders are female prone owing to the presence of eostrogen receptors in the thyroid tissue[2].

The most of the patients in this series came from rural areas (88%) having a socio-economic status < 10,0007 per month (54%).

In this series, after operation, histopatho-logical report analysis was done and found that nodular colloid goitre was 52% (30% + 22%), follicular adenom was 24%, papillary carcinoma was 12%, follicular carcinoma was 4% & auto immune thyroiditis was 6%. Among the malignancies papillary carcinoma was 66.66%, follicular carcinoma was 22.22% and anaplastic carcinoma each was 11.11%. It was almost similer to study of zygmunt and Meckenzic[10].

In this series, relative frequency of malignancy in solitary thyroid nodule was 28% and in multi-nodular goitre was 8% which co relate with study of Asraf,[5,6,8] Rahman[5] and Satter. In study of Rahman in solitary thyroid nodule, malignancy was 21.44% and in multi-nodular goitre was 8.1%. Another study shown & chance of malignancy 9.89%[6]. One of the study in abroad found 5% of thyroid nodule was malignant[7]. It is observed that relative frequency of malignancy was higher than that of others. It might be happened due to small sample size, sampling bias, by chance, advanced stage of disease our patients took surgical treatment in advanced stage of disease. In this study frequency of malignancy differs significantly with age & sex, older patients and male sex are more prone to develop malignancy ($p < 0.05$).

In this study observed that follicular carcinoma occurred in the age group 31-40 years but follicular carcinoma usually occurs in the age group 50-59 years. So it is a matter of thinking that follicular carcinoma is occurring in early age group. But it may be a good sign that our patients are becoming aware regarding thyroid nodule and are attending in the hospital for early surgical treatment.

**Summary**

Clinically nodular goitre is the most common problem of thyroid disease in all ages. Clinical importance of thyroid nodule is exclusion of malignancy. Female was more commonly affected than male. The highest number of patients were found in age group 31-40 years. All the patients were in euthyroid state clinically & also biochemically. Clinically solitary nodular goitre was found 56% and rest was multi-nadular goitre.

After operation histopahtological examination (gold standard investigation) revealed nodular colloidal goitre 52%, follicular adenoma 34%, papillary carcinoma 12%, follicular carcinoma 4%, anaplastic carcinoma 2% and auto immune thyroiditis 6%. Among malignancies papillary carcinoma was 66.66%, follicular carcinoma 22.22%, anaplastic carcinoma each was 11.11%. Relative frequency of malignancy in solitary thyroid nodule and in multi-nodular goitre was 28% and 8% respectively.

## Conclusion

A significant proportion of solitary thyroid nodule & multi-nodular goitre may be malignant. So, it should get appropriate medical attention. Our people should be offered the early treatment of thyroid nodule is better and late treatment of even asymptomatic thyroid nodule may be fatal.

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