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**Research Article**

# Clinicopathological study of Multinodular goiter at AVBRH

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## Abstract

**Aim:** To study the clinicopathological features of multinodular goiter and its management at AVBRH, rural set up.

**Method:** Total 57 cases of multinodular goitre (MNG) were studied. Patients of all age group, of both sexes with complaints of swelling over neck were included. Patients were subjected for clinical palpation, ultrasonography (USG), Lymph Nodes examination, thyroid profile, Fine-needle aspiration cytology (FNAC) and accordingly treated with surgical and medical mode of management. All operated specimens were sent for histopathological evaluation.

**Results:** 17 patients (29.82%) were between age group of 20 to 30 yrs with a female preponderance.11 patients (19.29%) presented with single nodule on palpation but their USG findings showed multiple nodules. All the 57 studied subjects underwent FNAC, out of which 51 cases (89.47%) turned out to be benign and 6 cases (10.52%) were malignant. Out of 57 patients 35 underwent histopathological examination of which 28 cases (80%) were benign and 7 cases (20%) were malignant.

**Conclusion:** Taking into consideration Histopathology report as a gold standard, correlation of FNAC finding with histopathology finding showed 100% sensitivity, 93.33% specificity with 71.42% positive predictive value and 100% negative predictive value.

**Keywords:** Multinodular goiter, FNAC, Histopathology

## 1. Introduction

Thyroid nodules are common clinical findings and have a reported prevalence of 4% to 7% in the adult population[1-3]. Discrete thyroid swellings are common and are present in 3-4% population in UK and USA.[4,5] Thyroid swellings are four times more common in females.[4] Importance of discrete thyroid nodule lies in the risk of neoplasia as compared to other thyroid swellings. Fifteen percent of isolated swellings are malignant.[5] FNAC has now supplanted most of the other tests for pre-operative evaluation of thyroid nodules.[6,7,8] Due to its simplicity, low cost and absence of major complications, this procedure is being performed on an increasing number of patients, which has led to the detection of thyroid cancers at earlier stages, resulting in better outcome of patients. However, only limitation is to differentiate between follicular adenoma and carcinoma. Ultrasonography has occupied a definite place in the management of diseases affecting various parts of the body, ever since its introduction to the medical field. The thyroid nodularity evaluation with normal or enlarged volume can be performed with a much higher sensitivity by high-resolution ultrasonography when compared with palpation. A palpable solitary nodule represents a multinodular gland in about 35% of patients. When treatment of MNG is considered the patient's overall health and comorbidities required critical assessment. The etiology and co-existent thyroid diseases associated with MNG often direct the ultimate type of treatment. Toxic and nontoxic MNG should be addressed separately, and the type of treatment should be directed at each of these types of MNG, as well as the issues related to the success of each treatment option. Treatments include non surgical and surgical approaches. Regional trends often influence the management of MNG.

## 2. Material and method

The present study was carried out in Jawaharlal Nehru Medical College and Acharya Vinoba Bhave Rural Hospital.

### 2.1 Inclusion criteria

The present study was carried out in Jawaharlal Nehru Medical College and Acharya Vinoba Bhave Rural Hospital, a Rural Medical College, located in the village of Sawangi Meghe, near Wardha, over a period of 30 months from April 2011 to August 2013 in patients presenting with multinodular goitre to the Department of General Surgery.

### 2.2 Exclusion criteria

a) Solitary Thyroid Nodule
b) Simple Thyroid swelling

## 3. Results

**Table 1: Distribution of multi nodular goitre according to age**

| Age group | No of patients | Percentage (%) |
|---|---|---|
| 20-30 Yrs | 17 | 29.82 |
| 31-40 Yrs | 12 | 21.05 |
| 41-50Yrs | 16 | 28.07 |
| 51-60 Yrs | 06 | 10.52 |
| 61-70 Yrs | 04 | 07.01 |
| 71-80 Yrs | 01 | 01.75 |
| 81-90 Yrs | 01 | 01.75 |
| Total | 57 | 100% |

The majority of patients presenting with MNG were in 2nd decade of life. Incidence of MNG was low in children and old people. Total of 17 patients (29.82%) were in age group of 20 to 30 years.

**Table 2. Distribution of cases according to sex**

| Sex | No of patients | Percentage (%) |
|---|---|---|
| Male | 12 | 21.05% |
| Female | 45 | 78.94% |
| Total | 57 | 100% |

Total 57 patients were included in the study, out of which 45 (78.94%) were females and 12 (21.05%) were males. This shows a female predominance in the presentation of multinodular goiter.

**Table 3. Number of nodules clinicaly palpable**

| Clinically Palpable | No of patients | Percentage (%) |
|---|---|---|
| 1 | 11 | 19.29% |
| 2 | 36 | 63.15% |
| 3 | 10 | 17.54% |
| Total | 57 | 100% |

The number of patients presented with two nodules in the thyroid swelling which was detected on clinical examination and palpation were 36 patients (63.15%) out of 57 studied patients. The remaining 11 patients (19.29%) presented with single nodule on palpation.

**Table 4. Number of nodules on USG**

| No of Nodules on USG | No of patients | Percentage (%) |
|---|---|---|
| 1 | 1 | 01.75% |
| 2 | 37 | 64.91% |
| 3 | 11 | 19.29% |
| 4 | 7 | 12.28% |
| 5 | 1 | 01.75% |
| **Total** | **57** | **100%** |

All the studied patients underwent ultrasonography where the numbers of patients reported with two nodules were 37 patients (64.91%), which confirmed the findings of palpation.

**Table 5. FNAC Results of the study group**

| FNAC Finding | No of Patients | Percentage (%) |
|---|---|---|
| Nodular Goitre | 35 | 61.40% |
| Adenomatous Goitre | 9 | 15.78% |
| Colloid Goitre | 1 | 01.75% |
| Papillary Carcinoma | 6 | 10.52% |
| Follicular Adenoma | 2 | 03.50% |
| Thyroiditis | 3 | 05.26% |
| Graves Disease | 1 | 01.75% |
| **Total** | **57** | **100%** |

FNAC was done in all 57 subjects. The subjects found to have nodular goiter were 35 (61.40%) and those found to have malignancy were only 6 subjects (10.52%).

**Table 6. Histopathological findings of the study group**

| H/P Finding | No of patients | Percentage (%) |
|---|---|---|
| Multinodular Goitre | 24 | 42%.10% |
| Adenomatous Goitre | 01 | 01.75% |
| Medullary Carcinoma | 01 | 01.75% |
| Papillary Carcinoma | 06 | 10.52% |
| Hashimotos Thyroiditis | 01 | 01.75% |
| Follicular Adenoma | 02 | 03.50% |
| Total | 35 | |

Out of 57 studied patients, 35 underwent biopsy, majority of which were benign thyroid lesions.

**Table 7. Correlation between FNAC and histopathological findings**

| True Positive (a) | False Positive (b) |
|---|---|
| 5 | 2 |
| **False Negative (c)** | **True Negative (d)** |
| 0 | 28 |

In our study sensitivity was 100%, specificity was 93.33%, positive predictive value was 71.42% and negative predictive value was 100%.

## 4. Discussion

The patients were between 17 to 90 years of age with a mean age of 41.49 years. These findings correlate with studies conducted by Chowdary *et al*[9], Hanumanthappa[10], who suggested occurrence of multinodular goiter in 2nd and 3rd decade of life.

In our study 45 out of 57 cases were females (78.94 %), which correlates with studies of Mans Akerman[11], Mazzaferi *et al*[12], Ellen *et al*[13] where there was strong evidence of female preponderance. Out of 57 studied subjects 11 patients (19.29%) presented with solitary nodule which turned out to be mulinodular on USG, which strongly proves the important role of USG as stated by Zhu *et al*[14], Andrew Holden[15], Varverakis *et al*[16].

In the present study none of the patients were posted for repeat FNAC due to inadequate sample. All the samples were adequate. The adequacy of the smear was 100% in our study, supported with studies of Cap *et al*[17], Bannur *et al*[18], where it was 92.5% and 90% respectively.

In our study out of 57 smears, 51 cases (89.47%) were benign and 6 cases (10.52%) were malignant which is contrary to the findings of Manderkar *et al* in 1995 [19] who found that from 1557 smears reported 89.58% were benign and 1.73% were malignant lesion and Bruch *et al* in 1996 [20] in a study of 348 patients reported benign lesion in 82.75% and malignancy in 4.31%. Comparatively our sample size was very small. Out of 57 smears, 35(61.40%) were nodular goiter, which is supported by findings of Silverman *et al*[21] (65.93%), Hawkins *et al*[22] (72.83%).

Silverman *et al* in 1986 reported out of 273 cases, 13 (04.76%) with thyroiditis. Hawkins *et al* in 1987 out of 1377 cases he reported 86 (06.24%) with thyroiditis. In our study we had a single patient (01.75%) with thyroiditis. Chu *et al* in 1979 [23] out of 109 cases he reported 15 (13.76%) with papillary carcinoma. Mair *et al* in 1989 [24] out of 27 cases he reported 3(11.11%) as papillary carcinoma. In our study 6 patients (10.52 %) presented with papillary carcinoma.

Taking into consideration Histopathology as a gold standard, correlation of FNAC finding with histopathology finding was done. Out of 57 FNAC studies, 35 patients underwent surgery and histopathological examination.

In the present study out of 35 histopathology reported, 28 (80%) cases were reported as benign which included 25(71.42%) reported as benign goiter, 1 (2.85%) was Hashimoto's thyroidits, 2 (5.71%) were follicular adenoma. Out of 35 histopahology reports, total of 7 cases were malignant, with a single (2.85%) medullary carcinoma and 6 (17.14%) found to be papillary carcinoma. Out of 25 cases of benign goiter, all 25 cases (100%) correlated with FNAC report as histopathology also suggested benign lesion. Cases of thyroiditis also failed to correlate (FNAC s/o follicular adenoma). From 2 cases of follicular adenoma only one case correlated with FNAC findings.

Out of 7 reported malignant conditions which include 6 (17.14%) papillary carcinoma and a single (2.85%) medullary carcinoma, from which only 5 correlated, as one medullary carcinoma was diagnosed as adenomatous goiter and one papillary carcinoma was diagnosed as nodular goiter on FNAC, so the correlation for malignancy was 71.42%.

Our study findings are similar to the findings of Goellner *et al*[25], Altavilla *et al*[26] and Manderkar *et al*.

In our study sensitivity was 100%, specificity 93.33%, Positive predictive value 71.42% and Negative Predictive value 100% which nearly correlates with the findings suggested by Sidharth Chacko *et al*.[27]

Fine Needle Aspiration Cytology is a sensitive and highly specific method of evaluating thyroid nodules for malignancy.[28]

## 5. Conclusion

In our study Multinodular goiter was commonly observed in females. Multinodular goiter is commonly observed in 2nd and 3rd decade of life. In most of the cases one can diagnose number of nodules clinically. However ultrasonography has an important role in detecting actual number of nodules. This information is very essential for further investigations and necessary management. In 11 patients who have clinically solitary thyroid nodule turned out to be multinodular on USG. Fine needle aspiration cytology is the most important investigation for multinodular goiter. Pre operative evaluation with ultrasound and FNAC can minimize the extent of surgery to be performed. Most of the times multinodular goiter turned out to be a benign pathology. Histopathological examination of the resected specimen proved useful to exclude malignancy.

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