ORIGINAL ARTICLE

Journal of Contemporary Medicine and Dentistry
www.jcmad.com
ISSN [P-2347-4513]
ISSN [O-2349-0799]
Year: 2019
Volume: 7
Issue: 2
10-13

# A Clinical Study of Etiology and Management of Multinodular Goiter

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## Abstract

*The study was done to evaluate the clinical presentation, surgical management and its outcomes on the patients with multinodular goiter.* ***Methods:*** *This prospective study was conducted in the Department of General Surgery Prathima Institute of medical sciences, Karimnagar. A total of n=100 patients were studied during the study period out of which n=86 were females and n=14 were males. All patients who were clinically diagnosed as MNG were selected. A detailed investigation including CBP, urine analysis, FBS, liver functions serum cholesterol, an x-ray of the neck-AP and lateral views and chest X-ray and ENT examination. All patients were investigated for Thyroid profile and some patients for Thyroid Isotope scan before surgery and submitted for FNAC of the thyroid swelling. All patients underwent standard surgical procedures and all the excised thyroid specimen were sent for Histopathological examination.* ***Results:*** *Age group most commonly affected: 21 – 40 years, 60 cases (60 %) Next Age group affected: 41 – 50 years, 22 cases (22%) Total Male patients 14 (14 %) Total Female patients: 86 (86 %) Ratio of female to Male patients: 6:1. Colloidal goiter was diagnosed in 78% of the patients and Hashimoto's thyroiditis, follicular adenoma was in 6% respectively. Papillary carcinoma was in 6% and medullary carcinoma along with papillary carcinoma was in 4% of the patients.* ***Conclusions:*** *Multinodular goiter is common in females and the main indications of surgery in MNG are a cosmetic problem, pressure effect symptoms, secondary thyrotoxicosis and suspicion of malignancy. Subtotal thyroidectomy is the surgery of choice for MNG.*

***Keywords****: Multinodular goiter, Thyroid gland, surgical management*

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**Date of Acceptance: 06/05/2019**

## Introduction

The thyroid gland is the largest endocrine gland it is situated in the lower part of the front and the sides of the neck. The main functions of the thyroid gland include regulation of BMR; it also stimulates somatic growth, psychic growth, and regulation of calcium metabolism. The normal thyroid gland is not palpable, however, when enlarged it is palpable and enlargement of the gland is one of the important manifestations of thyroid disease. Generally, Goiter is the term used to denote any enlargement of the thyroid is called goiter. The enlargement may be either generalized or localized, which again may be, toxic or nontoxic. The nontoxic goiter is further divided on the etiological basis as endemic goiter and sporadic goiter. A solitary nodule is a goiter which on examination appears to be a single nodule in one lobe of the thyroid gland and no palpable abnormality in other areas of the gland. [1] The endemic goiter is defined as one where more than 10% of the population shows thyroid enlargement. [2]Diseases of thyroid gland especially multinodular goiter due to deficiency of iodine are prevalent in India. Lesions of thyroid are predominantly confined to females in the ratio of 5:1 and this has been

attributed to variations of thyroid hormone during female reproductive function and physiological events such as puberty, pregnancy, and lactation. Incidence of nodular goiter increases with increasing age and MNG can become malignant but is rare. We in the present study tried to evaluate the clinical pattern and presentation of patients with multinodular goiter histopathological study and methods of management of multinodular goiter.

## Materials and Methods

This Prospective study was conducted in the Department of General Surgery Prathima Institute of medical sciences, Karimnagar. Institutional Ethical committee permission was obtained for the study. Written consent was obtained from all the participants after explaining the nature of the study in their local language. A total of n=100 patients were studied during the study period out of which n=86 were females and n=14 were males. Inclusion criteria were the patients with clinical evidence of multinodular goiter were taken up for the study randomly, excluding malignancies detected preoperatively and the results were compared with other studies. All patients who were clinically diagnosed as MNG were selected. A detailed history was taken and special emphases were on the duration of the swelling, pressure symptoms, toxic symptoms, associated illnesses, previous exposure to neck radiations, history of anti-thyroid drugs use and positive family history. The primary reason for the presentation was to evaluate as to whether the patient has hypothyroid symptoms or hyperthyroid symptoms. A detailed investigation including CBP, urine analysis, FBS, liver functions serum cholesterol, an x-ray of the neck-AP and lateral views and chest X-ray and ENT examination. All patients were investigated for Thyroid profile and some patients for Thyroid Isotope scan before surgery and submitted for FNAC of the thyroid swelling. All patients underwent standard surgical procedures and all the excised thyroid specimen were sent for Histopathological examination. Patients were discharged after removing the sutures and were followed up to one year. They were advised to take the needful medications after surgery.

## Results

**Table 1: Age and Sex wise distribution**

| Age(Years) | Male | Female | Total | % |
|---|---|---|---|---|
| 01 – 10 | 00 | 00 | 00 | 00 |
| 11 – 20 | 00 | 04 | 04 | 04 |
| 21 – 30 | 02 | 28 | 30 | 30 |
| 31 – 40 | 02 | 28 | 30 | 30 |
| 41 – 50 | 04 | 18 | 22 | 22 |
| >51 | 06 | 08 | 14 | 14 |
| Total | 14 | 86 | 100 | 100 |

Age group most commonly affected: 21 – 40 years, 60 cases (60 %) Next Age group affected: 41 – 50 years, 22 cases (22%) Total Male patients 14 (14 %) Total Female patients: 86 (86 %) Ratio of female to Male patients: 6:1.

**Table 2: Incidence of pressure symptoms**

| Symptoms | Cases | % |
|---|---|---|
| Alteration in the voice | 00 | 00 |
| Difficulty in Swallowing | 16 | 16 |
| Difficulty inbreathing | 06 | 06 |
| Pressure symptoms | 78 | 78 |
| Total | 100 | 100 |

Most common pressure symptoms in 78% of patients second were difficulty in swallowing, followed by difficulty in 16% followed by difficulty in breathing 6% of the patient's table-2.

**Table 3: Incidence of Toxicity**

| Toxicity | Female | Male | Total | % |
|---|---|---|---|---|
| With Toxicity | 32 | 2 | 34 | 34 |
| Without Toxicity | 54 | 12 | 66 | 66 |
| Total | 86 | 14 | 100 | 100 |

**Table 4: Histopathology picture (HPE)**

| HPE Report | Cases | % |
|---|---|---|
| Colloid goiter | 78 | 78 |
| Hashimoto's Thyroiditis | 06 | 06 |
| Follicular Adenoma | 06 | 06 |
| Follicular Carcinoma | 00 | 00 |
| Papillary Carcinoma | 06 | 06 |
| Medullary Ca with papillary ca | 04 | 04 |
| Total | 100 | 100 |

Colloidal goiter was diagnosed in 78% of the patients and Hashimoto's thyroiditis, follicular adenoma was in 6% respectively. Papillary carcinoma was in 6% and medullary carcinoma along with papillary carcinoma was in 4% of the patients shown in table 4.

**Table 5: Complications of Surgery**

| Complications | Cases | % |
|---|---|---|
| Reactionary Haemorrhage | 00 | 00 |
| Transient Hypoparathyroidism | 08 | 08 |
| Permanent Hypoparathyroidism | 00 | 00 |
| Temporary Recurrent laryngeal nerve palsy | 05 | 05 |
| Permanent Recurrent laryngeal nerve palsy | 00 | 00 |
| Wound infection | 04 | 04 |
| Total | 18 | 18 |

## Discussion

In the present study, one hundred patients presenting with Multi nodularity of the thyroid gland without obvious evidence of malignancy were studied and evaluated in terms of history, clinical examination and subjected for relevant investigations, taken up for surgery with prior FNAC and histopathology of the operated specimen was done postoperatively. Of the hundred cases studied, 14 were males (14 %) and 86 were females (86%) with a female to male ratio of 6:1. Antonio Rios et al (2005) showed that 90% were females. [3]A study by Tsan et al; [4] showed female to male ratio was 7:1. A study by P. Sreenivas et.al (2016) has shown a 6:1 ratio of female to male. [5] Another study by Bombil et al; reported a sex ratio of 6:1.[7] KK. Sanjeeva et al; [6] study show a female to male ratio of 9:1. In this study the majority of the females 56%, (56 cases) presented in the age group between 21 – 40 years. A Study by P. Sreenivas et al; also shows similar prevalence [5] similar prevalence has also been reported in prospective studies by MM Rahman et al; [8] S Sengupta et al; [9] and Imad et al; [10] where prevalence was highest in Middle age group (30-40). The present study is compared to the above studies as this is of concern because most of the patients managed were in the reproductive age group. During our study period, totally 165 thyroid surgeries were done for various diseases of the thyroid. Multinodular goiter was the commonest indication for surgery with 100 cases; followed by solitary nodule of the thyroid (36 cases), Diffuse toxic goiter (25 cases) and Malignancy (4 cases). Most of the swellings – 86 cases (86%) were not associated with pain and only 14 cases (14%) had pain. Pressure symptoms were seen in 22% (22 cases) as against 29% in Antonio Rios et al; [3] study. In our study 16 cases (16 %) presented with difficulty in swallowing and 6 cases (6%) with difficulty in breathing. Against K K. Sanjeeva et al; [6] study where 6% presented with pressure symptoms 5% with discomfort and 1% with difficulty in swallowing. Thus, difficulty in swallowing was the commonest pressure symptom in the present study. FNAC of the thyroid was done in all the cases and the results compared with the histopathological report of the operated specimen. FNAC showed an incidence of 78% of colloid goiter, 14% of Hashimoto's thyroiditis and 8% of follicular neoplasm. On correlation of FNAC with Histopathological examination in the present study, it showed 84% incidence of non-neoplastic lesions, of which 78% were colloid goiter, 6% were Hashimoto's thyroiditis with a 16% incidence of neoplasia, of which 6% were follicular adenoma, 6% were papillary carcinoma and 4% were medullary carcinoma with papillary changes. No metastasis was detected. KK Sanjeeva et al; [6] study reported an incidence of 91% of non-neoplastic reports, of which 77% are colloid nodular goiters and 14% are Hashimoto's thyroiditis and 9% incidence of Neoplasia in MNG with 6% benign and 3% Malignant. We had 14 cases of MNG with thyroiditis and were operated for cosmetic reasons similar to KK. Sanjeev et al; [6] study. The main indication for surgery in our series was the cosmetic problem. The next common indication was for pressure effects of the goiter like dysphagia and dyspnoea and secondary thyrotoxicosis. The six cases of follicular neoplasms were operated to rule out follicular carcinoma. Of the 100 cases, 32 cases were subjected to total or near-total thyroidectomy and the remaining 68 cases underwent subtotal thyroidectomy. Unlike KK Sanjeeva et al; [6] where 59% of Cases underwent Subtotal thyroidectomy. In both the studies, maximum cases of multinodular goiter have undergone Subtotal thyroidectomy. Patients were put on thyroxine supplements when indicated. On follow up visits, patients were monitored for T3, T4 and TSH levels and evaluated clinically. Patients were assessed for any recurrence of

symptoms, recurrence of nodules, and hypothyroid features. There were 4 cases of wound infection which responded very well to broad-spectrum antibiotics. Against 2% of patients developed wound infections in KK Sanjeev et al; [6] study. In a study by Rosato et al; [11] wound infection was reported in 0.3% cases.

## Conclusion

Within the limitations of the present study, it can be concluded that Multinodular goiter is common in females and the main indications of surgery in MNG are a cosmetic problem, pressure effect symptoms, secondary thyrotoxicosis and suspicion of malignancy. Subtotal thyroidectomy is the surgery of choice for MNG. But a trend towards total thyroidectomy is replacing subtotal thyroidectomy in the management of MNG as recurrence of goiter is avoided and second thyroid surgery is difficult and associated with a high risk of complications.

***Conflict of Interest:*** *None declared*
***Source of Support:*** *Nil*
***Ethical Permission:*** *Obtained*

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