

## Association of Multi-Nodular Goitre with Different Age Groups of Women

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### ABSTRACT

**Background:** Multi nodular goitre with hyperthyroidism is common in developing countries where the population is iodine-deficient.

**Aims:** Present study was tried to find out the relationship of age with multi-nodular goitre in women with different age groups.

**Methods:** Forty two women with biopsy and ultrasound confirmed multi-nodular goitre were included in the study. Women were underwent surgery in Surgical Department of Sir Ganga Ram Hospital Lahore. Their detailed information was entered in a proforma after taking their consent. Blood sample of patients was drawn and sent to laboratory for estimation of level of thyroid hormone and Thyroid stimulating hormone.

**Results:** Multi-nodular goitre was more common in old age group and less common in middle age group. It was observed that in all age groups only T3 was increased while the level of TSH and T4 was normal. 50% women showed the problem of hypertension and diabetes in middle age and old age. On the other hand in age group 20-30 years women visited have no disease other than the problem of multi-nodular goitre.

**Conclusion:** It is therefore concluded that multi-nodular goitre is common in women from puberty or adolescence to old age so there is need to check thyroid status in every age group as early awareness may prevent the advancement of disease which may lead to surgery.

**Keywords:** Multi-nodular goiter, women, age

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### INTRODUCTION

Multi-nodular goiter (MNG) is used to describe an enlarged, lumpy thyroid gland, more common in women than men and associated with hyperthyroidism. Risk factors include age, sex, environmental factors and family history<sup>1</sup>. The prevalence of multinodular goitre was 1% with age range 18-35 years<sup>2</sup>. However the prevalence in elderly individuals has a varied range between 0.4 and 2.0%<sup>3,4</sup>.

Multinodular goiter is believed to be based on two factors. The principal factor is genetic heterogeneity of follicular cells with respect to thyroid function (synthesis of thyroid hormone) and growth of thyroid gland. The second factor is the attainment of new potentials that were not observed in mother cells and become inheritable during further replication<sup>5</sup>. Causes of thyroid gland enlargement may include iodine deficiency, ineffective thyroid hormone production, mutation in TSH receptor, gland inflammation, and tumors in the thyroid<sup>6</sup>.

Significant hyperthyroidism, defined as serum TSH concentration <0.1 mIU/l and a serum total T<sub>4</sub> concentration >170 nmol/l. Size of thyroid nodules

>1cm were found in 12% of population and considered as hyperthyroidism<sup>1,3,4</sup>.

Goiter may grow large enough to compress adjacent structures like the airway or oesophagus. Patients may experience difficulty swallowing, choking sensation, voice change or difficult breathing. A rapid change in size of the goitre or nodule may suggest malignancy but usually does not. Large nodules more than 1/2 inch in size should be considered for fine needle aspiration biopsy. This biopsy technique may be used in selection of patients for surgery<sup>7,8</sup>. The technique of Ultrasonography has been used to find the changes in the size of nodules in patients suspected for thyroid malignancy. Thyroid surgery may remove compression as well as symptoms like difficulty in swallowing, cough etc. It can also cure thyroid gland over activity associated with nodules<sup>9</sup>.

Most goiters do not affect the function of the thyroid gland. However a goitre may be considered as toxic goitre when it secretes too much thyroid hormone. The majority of patients with benign or malignant thyroid nodules are euthyroid. In spite of this, serum TSH measurement is recommended in all patients presenting with a nodule<sup>10,7</sup>.

Present study was tried to find out the relationship of age with multi-nodular goitre in women with different age groups.

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## MATERIAL AND METHODS

Forty two women with biopsy and ultrasound confirmed MNG were included in the study. Women were underwent surgery in Surgical Department of Sir Ganga Ram Hospital Lahore. Their detailed information was entered in a proforma after taking their consent. Blood sample of patients was drawn and sent to laboratory for estimation of level of thyroid hormone and Thyroid stimulating hormone. Estimation of hormones was carried out by ELIZA technique. Statistical analysis was carried out by using SPSS 18.0. Percentages mean and standard deviation were calculated.

## RESULTS

Variation in demographic and biochemical parameters in different age groups is tabulated

(Table). It was observed that among three age groups, the multi-nodular goitre was mostly observed in middle age group i.e. in women with age range 31-49 years as compared to women with age range 20-30 years and 50-60 years. However on the basis of percentage, MNG was more common in old age group and less common in middle age group. It was also observed that multi-nodular goitre was more common in our women as compared to simple goitre. BMI was only high in women with age range 50-60 years. It was observed that in all age groups only T3 was increased while the level of TSH and T4 was normal. No family history was observed in all cases. 50% women showed the problem of hypertension and diabetes in middle age and old age. On the other hand in age group 20-30 years women visited have no disease other than the problem of multi-nodular goitre.

Table: Variation in demographic and biochemical parameters in different age groups. Values are given in parenthesis.

Age groups	Types of goitre and frequency	Percentage MNG	BMI (Kg/m <sup>2</sup> )	Level of thyroid hormones	Family history	Any other disease
20-30 years (12)	Goitre (02) Multi nodular goitre (10)	83.3%	23.0±1.9	Increase T3, Normal TSH and T4	No family history of thyroid problem	Nil
31-49 years (20)	Thyroid nodules (02), Goitre (03) Multinodular goitre (15)	75%	24.2±2.3	Increase T3 Normal TSH and T4	No family history of thyroid problem	Hypertension (05) Diabetes (06)
50-60 years (10)	Multi nodular goitre (10)	100%	26.5±2.5	Increase T3 Normal TSH and T4	No family history of thyroid problem	Hypertension (03) Diabetes (03)

## DISCUSSION

Multi nodular goitre is associated with a hyperthyroidism. It is common in developing countries where the population is iodine-deficient. This iodine deficiency can cause goitre with nodules. Risk factors are increasing age and female. Patients undergoing thyroid surgery due to Grave's disease, multinodular goiter and toxic nodular goiter<sup>11</sup>,

Present study observed that multi-nodular goitre is most common in our women in every age. However the highest percentage is found in old age and young age groups. However a study reported that prevalence of nodular goiter increased with age from 2.7-2% in women aged 26 to 30 years, to 8.7-6.7% in women aged 36 to 40 years, to 14.1 and 12.4% in women aged 45 to 50 years, and to 18.0 and 14.5% in women age >55 years<sup>12</sup>.

A study concluded that multinodular goitre is possibly a condition that has its commencement in adolescence. Study stated that mildly diffuse enlargement of the thyroid gland in young age may be due to a physiologic complex structural and hormonal changes occurring at this age. It usually

regresses, but may be persist especially in females<sup>13</sup>. Another study reported that there was a higher prevalence of MNG due to spontaneous hyperthyroidism in the older age group compared with younger patients. However study found that younger patients had more severe thyrotoxicosis<sup>14,15</sup>. It is proposed that toxic multinodular goiter generally affects older individuals with a history of a long-standing nontoxic multinodular goiter<sup>16</sup>.

Our study observed that in all age groups only T3 was increased while the level of TSH and T4 was normal. According to a study in well-formed goiter, the production rate of TSH is normal or even decreased<sup>17</sup>. Recently it is reported that mean age of women with MNG was 41.4 years. The age was independently and significantly associated with serum TSH levels<sup>18</sup>.

Present study observed normal level of TSH and T4 in all age group of patients. Our study is in contrast with number of studies who reported that autonomous thyroid function become over hyperthyroid<sup>19</sup>. However, a study observed infrequent transient increases of serum T3 and / or T4<sup>20</sup>.

Present study observed that 50% women showed the problem of hypertension and diabetes in middle age and old age. On the other hand in age group 20-30 years women have no disease other than the problem of multi-nodular goitre. According to a Study patients with type 2 diabetes have larger thyroid glands than those without diabetes. It is stated that hyperthyroidism is usually associated with failing glycemic control and increased need of insulin and also increase insulin resistance. It is proposed that thyroid dysfunction is common in diabetic patients and may be responsible for metabolic disturbances<sup>21</sup>. Another study found that hypertension has been associated with thyroid dysfunction, mainly with hyperthyroidism. Study showed a direct influence of hyperthyroidism on blood pressure and pulmonary vasculature. Possible mechanism may include an autoimmune process which may cause endothelial damage<sup>22</sup>.

## CONCLUSION

It is therefore concluded that MNG is common in women from puberty or adolescence to old age so there is need to check thyroid status in every age group as early awareness may prevent the advancement of disease which may lead to surgery.

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