

Prevalence of Hypothyroidism in Females with Exodontia: A Randomized Prospective Study

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Abstract

Introduction: Primary hypothyroidism is a condition characterized by the failure of the thyroid gland to produce sufficient thyroid hormones. Thyroid hormones play an important role in the regulation of growth, development, and metabolic functions of the body.

Objectives: Hypothyroidism and diabetes mellitus are the two most common endocrine disorders in clinical practice. The aim of this study was to estimate the prevalence of hypothyroidism and diabetes in patients visiting to oral and maxillofacial surgery department for tooth extraction.

Materials and Methods: This study was conducted in the department of oral and maxillofacial surgery for 1 year. Patients for this study were selected from among the ones who attended the OMFS department for teeth extraction and were on medication for hypothyroidism and diabetes. Patients were divided into two groups. Group A patients having hypothyroidism Group B having hypothyroidism and diabetes.

Results: Hypothyroidism was seen in 284 males (20.10%) whereas 568 (79.89%) females. Diabetes was seen in 33.92% males and 66.07% were females. Both hypothyroidism and diabetes was seen in 32.5% males and 67.5% females complications in both groups following things were noted. In 60% intraoperative bleeding was encountered, wound infection and dry socket was found in 35% delayed wound healing was noted in 32% patients, post extraction swelling and pain in 65% of cases.

Conclusion: The percentage of hypothyroidism and diabetes in females is much higher than males. We suggest that routine screening of population, especially females between 30 and 60 years of age should be done, and healthy stress-free lifestyle be practiced.

Key words: Diabetes, Dry socket, Extraction, Hypothyroidism, Thyroid stimulating hormone

INTRODUCTION

The shape of thyroid gland resembles butterfly at the base of the neck and it produces several hormones. Thyroid gland produces two very important thyroid hormones, thyroxin called thymoglobulin thyroxin T4. It is an inactive hormone, and is a reserve supply.¹ In our circulation 95% hormone is T4, 5% is triiodothyronine T3. As per experts, T3 is the true and more powerful hormone than

T3. Both hormones are attached to the protein called thyroxin - binding globulin and are measured as total T3 and T4.²

The pituitary gland produces thyroid stimulating hormone or (TSH). This hormone stimulates the thyroid gland to increase the production of thyroid hormones. A high TSH determined by blood tests indicates that thyroid is under active and needs stimulation. While a low TSH means the thyroid is overactive. The thyroid gland is constantly reacting to the changes in the level of circulating TSH.³ The alterations in the level of circulating TSH³ causes constant reactions in the thyroid gland and thyroid problems arise as a result lack of response to TSH, faulty TSH secretions and thyroid releasing hormones, failure to produce thyroxin from thyroid gland or thyroid becomes autonomous (part or whole gland produce thyroxin without reacting to

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TSH changes).⁴ The thyroid regulates the metabolism of the body cells, emotions, appetite, mood, cognition, and behavior.⁵ Females are more affected with thyroid diseases than males in incidence. Thyroid has two lobes right and left that is situated anterolaterally on the trachea.⁶

Hypothyroidism results when thyroid gland releases an excess amount of its hormones in short (acute) or long (chronic) period of time. 15% of the population show abnormalities of thyroid gland anatomy on physical examination as per estimated records.⁷

When thyroid gland fail to synthesize enough thyroid hormone or when it fails to function adequately resulting in reduced amount of thyroid hormone in the body, is known as hypothyroidism.² Hypothyroidism results from either the disease outside the gland such as low intake of iodine, or deficiency within the gland like inflammation causing destruction of gland cells. Hashimoto's thyroiditis is a condition resulting from destruction of the gland, is autoimmune and results from the attack of the immune system on gland cells. Some females develop this condition after pregnancy and are called as postpartum thyroiditis.⁸

Other causes of hypothyroidism are radioactive iodine, surgical removal of the gland, diabetes,⁹ infertility,¹⁰ obesity,¹¹ and certain drugs like lithium. In iodine rich countries like United states and Japan most common cause is Hashimoto's thyroiditis.¹²

Patients with hypothyroidism are more susceptible to cardiovascular diseases (CVS). Suitable coagulation test is advised to the patients if they are on thyroid replacement and anticoagulants, physician should be consulted for such patients.^{9,10}

Dental surgical procedures should be avoided in patients who show severe stress or infection, abnormal weight gain, mental sluggishness, frog-like husky voice, and edematous appearance of the whole body called myxedema.^{1,3,5}

The most common oral findings of hypothyroidism are macroglossia, dysgeuses, poor periodontal health, delayed wound healing and delayed eruption, impactions, this may be due to lack of space for a proper eruption.¹³

Thyroid disease is very common in general population ranging from 6.6% to 13.4% whereas in diabetic patients the prevalence is still greater and varies from 10% to 24%.

MATERIALS AND METHODS

The prospective study was conducted in oral and maxillofacial surgery department. The patients who

reported for extraction of teeth with a history of hypothyroidism were included in the study (self-reported). Clinical symptoms such as husky voice, excess weight gain, CVS diseases and hypertension, diabetes, history of any drug intake such as anticoagulants, antidepressants, delayed wound healing, and bleeding disorders, were noted. Patients were divided into two groups. Group A included hypothyroid patients alone. Group B included patients with hypothyroidism with diabetes, hypothyroid and hypertension. Investigations such as bleeding time, clotting time, other coagulation tests, blood sugar, T3, T4, and TSH, were advised before extraction.

RESULTS

Total cases of extractions from January 2014 to December 2014 were 15961. Total males - for extraction 8786 (56.20%), total females for extraction 7175 (43.79%) females.

The TSH value above 4.3 to 10 mU/l was taken criteria. Hypothyroidism was seen in 284 males (20.10%) whereas 568 (79.89%) females (Figure 1).

Hypothyroidism alone seen in 33.92% males and 66.07% were females. Both hypothyroidism and diabetes was seen in 32.5% males and 67.5% females (Figure 2).

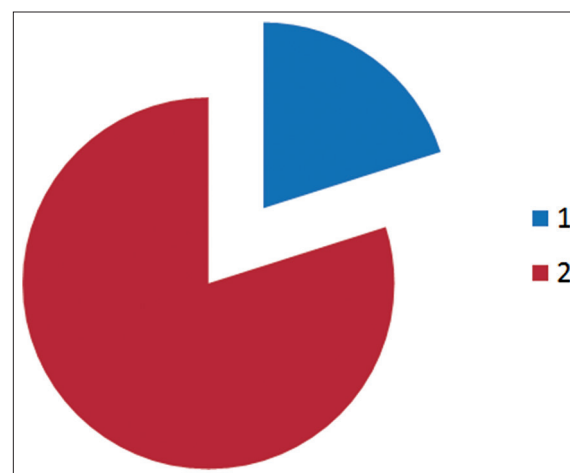


Figure 1: Pie chart 1 males 2 females

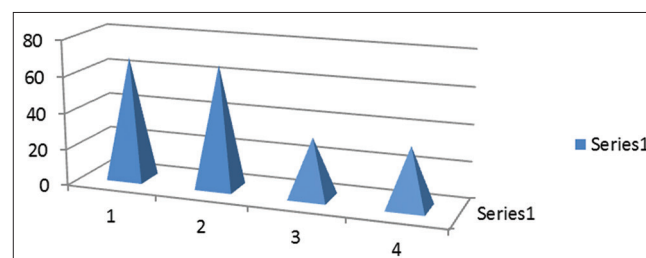


Figure 2: Male, female thyroid, diabetic and both ratio

Complications in both groups following things were noted wound infection/dry socket was found:

- Intra operative bleeding 60%
- Wound infection/dry socket was found 35%
- Delayed wound healing was noted in 32
- Pain and swelling in 65%
- Post-operative bleeding in 2% (Figure 3).

DISCUSSION

India has been given the status of “optimal iodine nutrition” in 2004 by WHO assessment of global iodine.^{14,15} 83.2% urban and 66.1% of the households now consume adequately iodized salt.^{16,17}

Recent studies have conducted in post iodization phase which has shown a transition from iodine deficiency state and an indication of a corresponding change in thyroid status of the Indian population.¹⁸ However, most of the studies are limited to certain geographical areas or cities similar to this study sample among them 852 patients were suffering from hypothyroidism (self-reported).

Thyroid disorder is the most common disorder of the endocrine system and is increasing predominantly in women.¹⁹ Females suffer more than males up to 5% of the females have altered thyroid function.^{20,21} This study also shows females suffering more than males (568 females and 284 males). Our study is consistent with worldwide reports particularly in midlife (45-55). As per studies, thyroid disorders are associated with cardiovascular risk factors such as hypertension and dyslipidemia.²²

The two most common endocrine diseases are hypothyroidism and diabetes mellitus.²³ In 1979, the association of these two diseases was published.²⁴ Several studies have been conducted in different countries to show an association between two diseases. There is

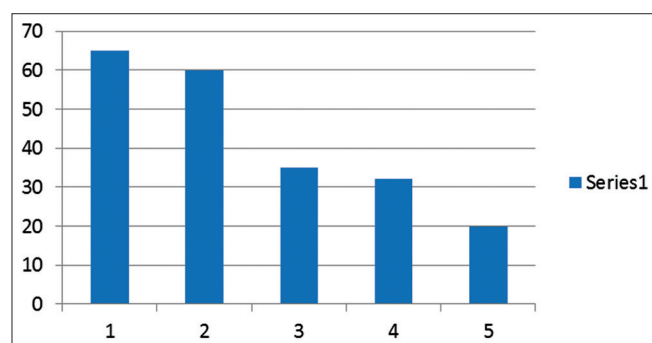


Figure 3: Post extraction complication associated with patients of hypothyroidism

great variability in the prevalence of thyroid diseases in diabetic patients from 6.6% to 13.4%.^{25,26} In our study hypothyroidism alone was seen in 33.92% males and 66.07% were females whereas diabetes and hypothyroidism were found 32.5% males and 67.5% females. Both the diseases were predominantly in women 67.5% (Figure 2). The prevalence figures noted women in this study draw attention to the growing health needs of this segment of Indian population.

Post extraction bleeding was noticed more in hypothyroid patients (60%) in comparison to normal patients. This may be because of excess subcutaneous mucopolysaccharides subcutaneous which decreases the ability of small blood vessels to constrict, resulting in excessive bleeding from in filtered tissues including mucosa and skin.²⁷ Bleeding was controlled by digital pressure packs. Post extraction pain, the swelling was seen in 65% of the cases whereas in 2% cases post-operative bleeding was seen (Figure 3).

Susceptibility to infection delayed wound healing is a very common feature of hypothyroidism, which may be due to decrease in metabolic activity in fibroblasts and increased risk of infection because of longer exposure of the wound to the pathogenic organisms. In this study, delayed wound healing in 32% and dry socket was present in 35% of cases in the present study (Figure 3).

Hypothyroid patients are more susceptible to cardiovascular diseases from arteriosclerosis and elevated LDL. Patients who are on anticoagulant therapy were given antibiotic prophylaxis depending on the severity for any invasive procedures.²⁸

Drug interactions of L-thyroxin include increased metabolism due to phenytoin, rifampicin, carbamazepine tricyclic antidepressants, iron sulfate, iodine. It also increases the effect of warfarin sodium.²⁹ Appropriate coagulation tests should be done in patients on anticoagulants and hormone replacement therapy.

CONCLUSION

Thyroid hormone have an important role on metabolism, regulating myocardial functions, homeostasis, pulmonary ventilation, mentioning vascular tone thus having a wide variety of actions in almost all systems of human body. Hypothyroidism and diabetes are two common endocrinal disorders in Indian population, especially in females in middle and older age groups. In a significant number of patients autoimmune mechanism appears to be a main etiologic factor. Our study had limitations because it was conducted in a small group of the population.

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