

## Review Article

### Management of thyroid patients in dental emergencies: A review

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#### ABSTRACT:

The thyroid regulates metabolism primarily and has an impact on every body function. The second most prevalent endocrine system glandular issue, thyroid dysfunction can manifest in any system of the body, including the oral cavity. Excess or insufficiency of these hormones have negative effects on the mouth. Endocrinologists must be knowledgeable about the oral symptoms of thyroid dysfunction before treating a patient with a thyroid condition. Before considering dental treatment from the dentist, the patient with thyroid dysfunction, as well as the patient taking medication for it, need appropriate risk management. For the patient's thyroid and oral health to be maintained, there must be reciprocal contact between the dentist and the endocrinologist.

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#### INTRODUCTION

The bilobular thyroid gland is located on either side of the trachea. Thyroid dysfunction is the second most common glandular disorder of the endocrine system and is on the rise, mostly in women.[1] Up to 5% of the female population has abnormal thyroid function,[2,3] and up to 6% may have thyroid nodules that can be felt clinically.[4] An estimated 15% of the general population has abnormal thyroid anatomy on physical examination, and an undetermined percentage of these do not undergo a diagnostic evaluation. It has been proposed that there might be twice as many afflicted people as cases that remain unidentified.[2] This implies that individuals who have undiagnosed hyperthyroidism or hypothyroidism are seen in the dentist chair, when standard care may not go as planned.[4]

To detect any complications and gauge the degree of control over the condition, the dental health care provider needs to be knowledgeable about both the systemic and oral signs of thyroid disease [Table 1]. All elective dental procedures should be postponed until a thorough medical evaluation is completed if a patient's thyroid condition is suspected. Individuals

who have a medical history of thyroid disorders should have a thorough evaluation to establish the appropriate course of treatment, with a focus on minimising stress and infection. Should an endocrinologist or the patient's primary care physician observe any signs or symptoms of thyroid disease during an examination, a consultation is recommended. In the first few weeks of thyroid treatment, thorough coordination with the endocrinologist is required if an urgent dental procedure is required.

#### HYPOTHYROIDISM

Reduced thyroid hormone production and thyroid gland function are the hallmarks of hypothyroidism. Surgery, radioactive iodine, long-term thyroiditis (Hashimoto's disease), and medications like amiodarone and lithium are the causes. Thyroid hormone deficiency results in a number of symptoms, including weight gain, a slower metabolic rate, fatigue, sensitivity to cold, dry, and chilly skin, and puffiness around the eyes and mouth. The heart rate is sluggish, but the blood pressure seems normal.

## **ORAL MANIFESTATIONS OF HYPOTHYROIDISM**

Cretinism, or childhood hypothyroidism, is characterised by malocclusion, delayed tooth eruption, thick lips, and a big protruding tongue (macroglossia). Increased accumulation of subcutaneous mucopolysaccharides, or glycosaminoglycans, as a result of a decrease in these substances' breakdown, is the cause of macroglossia and thickening of the lips. Mandibular second molar impaction is one of the long-term consequences of severe hypothyroidism on craniofacial growth and dental development. There appears to be inadequate room for these teeth to erupt properly as a result of a dissociation of ramus growth and a failure of regular resorption of the interior portion of the ramus.[5]

Hypothyroidism is frequently associated with oral manifestations such as delayed eruption, dysgeusia, macroglossia, poor periodontal health, altered tooth morphology, and delayed wound healing.[6] Prior to treating a patient with a history of thyroid disease, the dentist should ascertain the thyroid disorder's accurate diagnosis, aetiology, and history of medical therapy and consequences.

## **HYPERTHYROIDISM**

Thyroid hormone production that is out of control results in hyperthyroidism. Trembling, emotional instability, heat intolerance, sinus tachycardia, significant chronotropic and ionotropic effects, elevated cardiac output (increased risk of congestive heart failure), systolic heart murmur, hypertension, increased hunger, and weight loss are its defining characteristics.[7]

## **ORAL MANIFESTATIONS OF HYPERTHYROIDISM**

Thyrotoxicosis can cause increased caries susceptibility, periodontal disease, maxillary or mandibular osteoporosis, rapid dental eruption, burning mouth syndrome, and expansion of extraglandular thyroid tissue (mostly in the lateral posterior tongue).

Thyroid disease patients are more likely to experience Sjogren's syndrome, which causes dry mouth, and burning mouth syndrome, which produces a burning sensation in the mouth.[4]

Upon extraoral examination, the thyroid may be palpably enlarged or enlarged in Graves disease. When the patient is in the dentist chair in a supine position, the enlarged gland might be easier to see. However, in cases of more severely enlarged thyroids, the patient's neck bulges even when they are sitting or standing.

## **ROLE OF DENTIST**

For two reasons, the dentist finds it extremely important to comprehend thyroid dysfunction. First off, a major thyroid disease may go undiagnosed at first, with the dentist potentially being the first to

suspect it. Thus, the dentist is crucial to the health care team's ability to identify thyroid issues. The second justification is to prevent any oral issues that can arise from treating thyroid disease patients. When treating patients with thyroid disease, dental care modifications need to be taken into account.

When collecting patient X-rays, a dentist can safeguard the thyroid gland by wearing a thyroid collar. Since the thyroid is highly susceptible to radiation, there is evidence that excessive radiation exposure increases the likelihood of developing a number of thyroid disorders.

Dentists have treatment challenges while treating patients with thyroid illness. Understanding the potential adjustments required for dental treatment requires knowledge of the problem and the present state of therapy. The duration and status of treatment have a significant role in determining how well patients' metabolisms are controlled. Heart comorbidity is linked to the majority of problems in people with hyperthyroidism and hypothyroidism. Should an endocrinologist or the patient's primary care physician observe any signs or symptoms of thyroid disease during an examination, a consultation is recommended.

Dental professionals have a responsibility to be aware of the various aspects of the disease and treatment that could affect a patient whose medical history reflects thyroid problems. Under or over activity of the thyroid gland can also cause life-threatening cardiac events, so the dental practitioner must be knowledgeable about thyroid pathophysiology and the treatment of thyroid conditions. Dental treatment modification may be necessary for dental patients under medication. Stress reduction, awareness of drug side effects or interactions, and vigilance for appearance of signs or symptoms of hormone toxicity are among the responsibilities of the oral health care provider. If a suspicion of thyroid disease arises for an undiagnosed patient, all elective dental treatment should be postponed until a complete medical evaluation is performed.[4] A medically well-controlled patient will have no contraindications to have dental treatment.[9]

## **DENTAL MANAGEMENT OF HYPOTHYROIDISM**

**Hemostasis:** Individuals with chronic hypothyroidism may exhibit elevated subcutaneous mucopolysaccharides as a result of a reduction in the substances' breakdown. Excess subcutaneous mucopolysaccharides can lead to increased bleeding from infiltrated tissues, such as mucosa and skin, and can also impair the ability of tiny blood vessels to constrict when cut. Long-term local pressure will most likely be sufficient to stop the bleeding from the tiny vessels.[10]

**Susceptibility to infection:** Patients with hypothyroidism may experience delayed wound healing as a result of fibroblasts' lower metabolic

activity. Because the unhealed tissue is exposed to pathogenic organisms for a longer period of time, delayed wound healing may be linked to an increased risk of infection. Immunocompromised patients do not include those with hypothyroidism.

Individuals with hypothyroidism are more prone to increased LDL and arteriosclerosis-related cardiovascular disease. Consult the patients' primary care physicians, who can offer details on their cardiovascular conditions, before beginning treatment for such individuals. Depending on the severity of their arrhythmia, patients with atrial fibrillation may need to have antibiotic prophylaxis prior to invasive operations and be on anticoagulant therapy.[11] It is necessary to determine whether antibiotic prophylaxis is necessary if valvular pathology is present. Drug interactions and actions: Barbiturates and central nervous system depressants should be taken with caution in patients with hypothyroidism since they can exacerbate their sensitivity to them.[6,12]

Thyroiditis or hypothyroidism may become more likely if a surgical antiseptic containing iodine, such as Povidone, is recently used. Individuals who have a history of autoimmunity and underlying thyroid antibodies seem to be more vulnerable.[13]

Drug interactions involving l-thyroxine include decreased absorption with iron sulphate, sucralfate, and aluminium hydroxide, as well as enhanced metabolism brought on by phenytoin, rifampicin, and carbamazepine. Because l-thyroxine has gluconeogenic properties, it amplifies the effects of warfarin sodium and necessitates increased use of oral hypoglycemic medications. Tricyclic antidepressant use concurrently raises l-thyroxine levels.[14] When a patient is receiving thyroid hormone replacement therapy with an oral anticoagulant, appropriate coagulation tests ought to be accessible.

## DENTAL MANAGEMENT OF HYPERTHYROIDISM

**Hemostasis:** Due to the effects of thyroid hormone on sympathetic nervous system activity, patients with hyperthyroidism may have higher blood pressure and heart rate. To stop bleeding, patients with high arteriolar pressures can need more care and local pressure applied for a longer period of time. Patients with hyperthyroidism who use warfarin sodium have changes in previously therapeutic coagulation parameters due to the drug's accelerated metabolism.[10]

Propylthiouracil (PTU), an anti-thyroid medication, has anti-vitamin K activity and can lead to hypoprothrombinemia and bleeding, which increases the risk of bleeding. Therefore, before undergoing surgery or other invasive dental treatments, individuals on PTU must be thoroughly examined.[4]

**Susceptibility to infection:** Thionamides have the potential to induce agranulocytosis, a fairly uncommon reaction that affects 0.5% of patients and can lead to insufficient wound healing and oral

infections. Clinicians could avoid these post-operative problems by closely adhering to the thionamide precautionary measures mentioned.

**Drug interactions and actions:** Patients with hyperthyroidism should not take combination analgesics including acetylsalicylic acid (ASA) because ASA interacts with T4 and T3's protein binding, increasing their free form. This could make thyrotoxicosis symptoms worse.[15]

When taking  $\beta$ -blockers and having hyperthyroidism, patients should utilise NSAIDs with caution because the combination can reduce the effectiveness of the latter medication.[16]

Anxiety is higher in hyperthyroidism patients, and a thyrotoxic crisis can be brought on by stress or surgery. Elective dental care should be postponed and epinephrine is contraindicated for patients with hyperthyroidism who show signs or symptoms of thyrotoxicosis.[17]

Due to its ability to efficiently lower thyroid activity, fluoride has been utilised as a medication to treat hyperthyroidism. The reason for this is that fluoride can imitate the effects of thyrotropin (TSH). Overfluoridation is associated with additional thyroid-related problems, such as insufficient iodine. As members of the halogen group of atoms, fluorine and iodine are inimical to one another. Excess fluoride in the body might cause problems for the thyroid gland's operation. Thus, fluoride has been linked to thyroid problems. Patient who wish to avoid the effect of fluoride on their thyroid can utilize fluoride free toothpaste such as Carifree, an oral neutralizer gel.[18]

## CONCLUSIONS

Even in cases when there are no coexisting diseases, dental patients receiving medical management and follow-up for a thyroid problem may require alterations to their dental treatment plan. Among the duties of the oral health care practitioner are stress management, knowledge of medication interactions or side effects, and alertness to the emergence of indications or symptoms of hormone toxicity.

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