INTRODUCTION

Thyroid disease is more common among females and is increasing in incidence. An estimated 15 percent of the general population show abnormalities of thyroid anatomy on physical examination. The thyroid gland is composed of a right lobe and a left lobe that sit anterolateral to the trachea. This review mainly focuses on several modifications of dental treatment required for a patient suffering from a known thyroid disease.

DISORDERS OF THYROID GLANDS

Hyperthyroidism occurs when the thyroid gland releases too much of its hormones over a short (acute) or long (chronic) period of time.

The symptoms of hyperthyroidism are: a high state of excitability, intolerance to heat, increased sweating, mild to extreme weight loss, varying degrees of diarrhea, muscle weakness, nervousness or psychic disorders, extreme fatigue but inability to sleep, and tremor of the hands. Most people with hyperthyroidism develop some degree of protrusion of the eyeballs called Exophthalmos.

The oral manifestation of thyrotoxicosis are increased susceptibility to caries, periodontal disease, enlargement of extraglandular thyroid tissue, maxillary or mandibular osteoporosis, accelerated eruption of teeth, development of connective-tissue diseases and burning mouth syndrome (Table 1).

Hypothyroidism is a condition in which the thyroid gland does not synthesize enough thyroid hormone. The most common cause of hypothyroidism is inflammation of the thyroid gland, which damages the gland's cells. Autoimmune or Hashimoto’s thyroiditis, in which the immune system attacks the thyroid gland, is the most common example. Some women develop hypothyroidism after pregnancy (often referred to as “postpartum thyroiditis”).

Clinical manifestation of hypothyroidism: They include fatigue and extreme somnolence with sleeping up to 12 to 14 hours a day, extreme muscular sluggishness, slowed heart rate, decreased cardiac output, decreased blood volume, sometimes increased body weight, constipation, mental sluggishness, failure of many trophic functions in the body evidenced by depressed growth of hair and scaliness of the skin, development of a froglike husky voice, and in severe cases, development of an edematous appearance throughout the body called myxedema.

SUMMARY

Thyroid hormones play an important role in the regulation of growth, development and metabolic functions of the body. Dental professionals evaluate and update their patients' histories at each appointment. Among the items on the complex list of medical health concerns is thyroid disease. Thyroid problems are very common, and as thyroid gland affects almost every function of the body, professionals have to take precautionary measure when providing dental treatment to thyroid disease affected patients. Thyroid disease comprises a group of conditions that can affect the delivery of dental care. This article reviews several conditions where dental treatment has to be modified. The dentist can play a role in the screening of dental patients who have undiagnosed thyroid disease.

Key words: Thyroid diseases, dental treatment, alterations.

REVIEW

DENTAL TREATMENT ALTERATION IN THYROID DISEASE

1 NAGENDRA J
2 SRINIVASA J

SUMMARY

Thyroid hormones play an important role in the regulation of growth, development and metabolic functions of the body. Dental professionals evaluate and update their patients' histories at each appointment. Among the items on the complex list of medical health concerns is thyroid disease. Thyroid problems are very common, and as thyroid gland affects almost every function of the body, professionals have to take precautionary measure when providing dental treatment to thyroid disease affected patients. Thyroid disease comprises a group of conditions that can affect the delivery of dental care. This article reviews several conditions where dental treatment has to be modified. The dentist can play a role in the screening of dental patients who have undiagnosed thyroid disease.

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Oral findings in hypothyroidism include macroglossia, dysgeusia, delayed eruption of teeth, poor periodontal health, enamel hypoplasia in both dentitions, anterior open bite and delayed wound healing\(^6\) (Table 1).

**DENTAL MANAGEMENT FOR THE PATIENTS SUFFERING FROM THYROID DISEASES**

The dentist should be familiar with the clinical manifestations of thyroid disease so that the dentist can recognize any complication. If a suspicion of thyroid disease arises for an undiagnosed patient, all surgical dental treatment should be postponed until a complete medical assessment is completed.\(^6\) Guidelines for dental care for patients with known thyroid disease are given below;

In controlled hypothyroidism patients, the dentist can carry out the dental treatment like fillings as in healthy patients but should avoid dental surgical procedures in the patient who show severe stress or infection.

Hypothyroidism patients are susceptible to cardiovascular diseases. Before treating such patients, physician should be consulted.\(^6,10\) Suitable coagulation tests should be performed when the patient is taking an oral anticoagulant and thyroid hormone replacement therapy. Hypothyroid patents are sensitive to central nervous system depressants and barbiturates; hence these medications should be used cautiously.\(^11\) Antibiotic prophylaxis must be given to the patient suffering from valvular pathology and atrial fibrillation.\(^9\)

Hypothyroid patient on propylthiouracil treatment must be monitored for possible agranulocytosis, hypoproteinemia or bleeding, and a complete blood count list including prothrombin time be performed before doing any invasive procedure. During treatment of diagnosed patients who have hypothyroidism, attention should focus on tiredness, which can point out an uncontrolled condition and become a risk for patients as there may be chances of aspiration of dental materials. It is important to highlight the possibility of an iatrogenic hyperthyroid state caused by hormone replacement therapy used to treat hypothyroidism. The patients who have Diabetes Mellitus (DM) become hyperglycemic when treated with T.\(^4\) When providing dental care to patients who have DM, attention should focus on complications associated with poor glycemic control.\(^6,12,13\)

In patients with cardiovascular disease, local anesthetic and retraction cord with epinephrine is generally contraindicated.\(^14\) Regarding postoperative pain control, narcotic use should be limited, due to the heightened susceptibility to this agent.

There are some drugs that will interact with thyroxine. Thyroxine metabolism is increased when phenytoin, rifampin and carbamazepine are used. Its absorption is impaired when iron sulfate, sucralfate and aluminum hydroxide are used. Concomitant use of tricyclic antidepressants elevates thyroxine levels.\(^6\)

Besides, the presence of oral infection, central nervous depressants and surgical procedures can precipitate a myxedematous coma. Surgery procedures
should be avoided in these patients. Myxedematous coma comprises hypothermia, bradycardia, severe hypotension and epileptic seizure. If that occurs, dental treatment should be discontinued and emergency medical services should be provided.¹⁵

The dentist should have a detailed knowledge of the clinical and oral manifestations of thyrotoxicosis. Hyperthyroidism presents as anorexia and wasting, atrial fibrillation and congestive heart failure in older patients. In young patient, the clinical manifestation of hyperthyroidism is Graves’ disease, while middle-aged men and women present most commonly with toxic nodular goiter. A patient with history of Graves’ disease, a careful evaluation of its associated connective-tissue diseases like Sjogren’s syndrome and systemic lupus erythematosus should be done.¹,⁶

Hyperthyroid patients are also vulnerable to cardiovascular disease. Before performing any dental surgery or intervention, it is important that the dentist should discuss the cardiac history of these patients with the patient’s physician.¹⁶,¹⁷ Any invasive dental treatment should be postponed for more than six months to one year if the patient with symptoms of uncontrolled disease like tachycardia, irregular pulse, sweating, hypertension, tremor, or have ignored to follow the instructions of the physician.

A patient with thyroid storm crisis will have reduced levels of circulating neutrophils. Dental surgery is not recommended in this state as it can increase vulnerability to infection after treatment. A complete blood count with a Differential Leukocyte Count (DLC) is indicated if any medication induced leukopenia is present. Some drugs like Aspirin, oral contraceptives, estrogen and nonsteroidal anti-inflammatory drugs (NSAIDs) might reduce the binding of T4 to TBG in plasma, so there will be increase in circulating T4 levels, which can lead to thyrotoxicosis.⁶ The dentist must restrict the use of epinephrine or other pressor amines in local anesthetics of the retraction cords because the myocardium of these patients is sensitive to adrenaline and may unleash arrhythmias, palpitations and chest pain.¹⁸ During dental treatment, heightened consciousness toward oral soft and hard tissue manifestation should be emphasized.¹⁹

Hyperthyroid patients should undergo a proper oral examination including inspection and palpation of salivary glands.

Dentists must be aware of the signs and symptoms of a thyroid storm, as the patient could present for dental treatment during its preliminary phase or when undiagnosed. Patients who have hyperthyroidism have increased levels of anxiety, so stress or dental surgery

TABLE 2: SUMMARY OF DENTAL TREATMENT ALTERATIONS FOR THYROID DISEASE

<table>
<thead>
<tr>
<th>Hyperthyroidism</th>
<th>Hypothyroidism</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Avoid the use of adrenaline and control the spread of infection</td>
<td>• A complete blood count before performing dental surgery is recommended.</td>
</tr>
<tr>
<td>• Patients treated with propylthiouracil, a complete blood count should be done</td>
<td>• Avoid the use of adrenaline, control oral infection and do not use central nervous depressant drugs.</td>
</tr>
<tr>
<td>• NSAIDs and aspirin should be used with caution</td>
<td>• Dentist should have knowledge of drug interactions of thyroxine.</td>
</tr>
<tr>
<td>• Treatment should be discontinued if signs or symptoms of a thyrotoxic crisis develop.</td>
<td>• If myxedematous coma develops, dentist should avoid any planned dental surgery.</td>
</tr>
<tr>
<td>• These patients are susceptible to central nervous system depressant drugs such as barbiturates</td>
<td>• Patients are vulnerable to cardiovascular disease; proper consultation with the cardiologist is required before any surgical intervention.</td>
</tr>
<tr>
<td>• These patients are vulnerable to cardiovascular disease; a proper blood investigations and consultation with the physician is needed.</td>
<td>• Good glycemic control is required in patients with diabetes mellitus who will be undergoing a dental surgical treatment.</td>
</tr>
<tr>
<td>• Management of stress is important in these patients.</td>
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</tr>
</tbody>
</table>
can trigger a thyrotoxic crisis. The use of epinephrine should be avoided and dental surgery should be delayed for patients who exhibit signs or symptoms of thyrotoxicosis. Stress management is vital for hyperthyroidism. Dental treatment should be delayed if signs or symptoms of a thyrotoxic crisis develop and emergency medical services should be on hand.

If any emergency dental procedure is needed in the early stages of thyroid disease, close work-up with the physician is needed. The outlines of dental treatment modifications for thyroid disease are given in Table 2.

REFERENCES