

ORAL HEALTH STATUS OF CHILDREN SUFFERING FROM THYROID DISORDERS

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ABSTRACT

Background & Objective: - Thyroid is the major regulator of metabolism and affects all of the bodily functions. Thyroid dysfunction is the second most common glandular disorder of the endocrine system which may rear its head in any system in the body including the mouth. The oral cavity is adversely affected by either an excess or deficiency of these hormones..

Materials and Method: - A study was conducted among 80 children aged 3-15 years. The study group comprised of 40 children who were diagnosed as having thyroid disorder (hypo/hyperthyroidism) by physician specialist. All the relevant data like type of thyroid disorder, medical history, family history, demographic and personal details were recorded. Another group of 40 children who were healthy were selected as control group. Oral examination was carried out to assess the plaque level, gingival status, and dental caries using the plaque index by Silness P and Loe H 1967, gingival index by Loe H and Silness P 1963, DMFT and dmft index by the World Health Organization (WHO) criteria 1997 respectively.

Result: - Mean value for DMFT and dmft score of thyroid group (0.65 and 2.14, respectively) was higher than the control group (0.31 and 1.86 respectively) with a statistically non-significant difference between the two groups. Higher mean gingival index and plaque index scores were recorded in the thyroid group (1.316 and 0.876, respectively) compared to the control group (0.763 and 0.340, respectively) and the difference in the mean gingival index and plaque index between the two groups was found to be statistically significant with P value < 0.001.

Conclusion: - It was concluded that oral health status of children suffering from thyroid disorders was deteriorated when compared to the oral health status of healthy subjects. Hence, it becomes an obligation for the dentists especially the pediatric dentists to identify the thyroid disorders among their patients so as to modify the treatment modalities accordingly.

Key Words: - Hypothyroidism, Hyperthyroidism, Thyroid Gland Disorder.

Introduction

Thyroid gland lies on either side of the trachea and has bilobular structure. The second most common glandular disorder of the endocrine system is Thyroid dysfunction and it is at an increasing rate, predominantly among women.¹

Major regulator of metabolism in the body is thyroid and hence affects all the bodily functions.² Glandular disorder of the endocrine system such as thyroid dysfunction may rear its head in any system in the body including the oral cavity which may be affected by either hyper or hypo function of these hormones.³ Proper risk management of children with a thyroid dysfunction before considering dental treatment by a pedodontist is necessary. Thus, communication of pedodontist with physician specialist/endocrinologist must be good so as to maintain patient's oral health as well as thyroid health.⁴

Thyroid disorder are commonly divided into two major types hyperthyroidism and hypothyroidism, depending on whether serum thyroid hormone levels (T4 and T3) are increased or decreased, respectively.⁵ Thyroid diseases generally may be sub classified based on the etiologic factors and physiologic abnormalities.⁶

The common oral findings in hypothyroidism include the characteristic macroglossia, dysgeusia, delayed eruption, poor periodontal health, altered tooth morphology and delayed wound healing.⁷

Hyperthyroidism is a condition caused by unregulated production of thyroid hormones. It is characterized by tremor, emotional instability, intolerance to heat, sinus tachycardia, marked chronotropic and ionotropic effects, increased cardiac output (increased susceptibility to congestive heart failure), systolic heart murmur, hypertension, increased appetite and weight loss.⁸

The oral manifestations of thyrotoxicosis, includes increased susceptibility to caries, periodontal disease, enlargement of extraglandular thyroid tissue (mainly in the lateral posterior tongue), maxillary or mandibular osteoporosis, accelerated dental eruption and burning mouth syndrome.⁹

An increase in the prevalence of dental caries and periodontal disease in the patients with thyroid dysfunction has been seen in many past studies. Quite a lot of causes were hypothesized, like the disease itself, thyroidectomy, or the medication taken, which can lead to the increase in the severity of oral and dental diseases.¹⁰

The present study was thus undertaken to assess the oral health status of children suffering from thyroid disorders and to compare their oral health with that of the healthy subjects.

Materials and Methods

A study was conducted among 80 children aged 3-15 years. The study group comprised of 40 children who were

diagnosed as having thyroid disorder (hypo/hyperthyroidism) by physician specialist. All the relevant data like type of thyroid disorder, medical history, family history, demographic and personal details were collected. Another group of 40 children who were healthy were selected as control group making a total sample of 80 subjects.

Oral examination was carried out to assess the plaque level, gingival status, and dental caries using the plaque index by Silness P and Loe H 1967, gingival index by Loe H and Silness P 1963, DMFT and dmft index by the World Health Organization (WHO) criteria 1997 respectively.

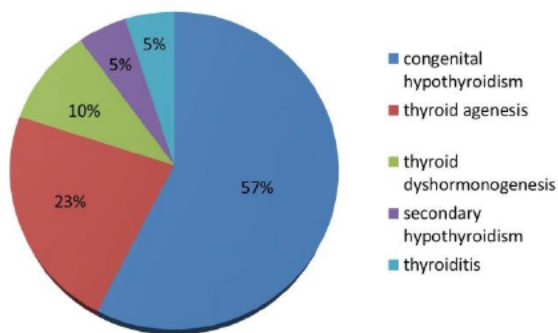
Results

SPSS version 15.0 was used to analyse the results. The data were expressed as mean ± standard deviation (SD). For intergroup comparisons of parameters such as DMFT, dmft, plaque index, gingival index the Z-test was used

Congenital Hypothyroidism	23
Thyroid Agenesis	9
Thyroid Dyshormonogenesis	4
Secondary Hypothyroidism	2
Thyroiditis	2

Table 1: - 40 thyroid disorder diagnosed children

Out of 40 thyroid disorder diagnosed children (Table 1), 23 children suffered from congenital hypothyroidism, 9 had hypothyroidism due to thyroid agenesis and 4 had hypothyroidism due to thyroid dyshormonogenesis, 2 from secondary hypothyroidism and 2 from thyroiditis. (Graph 1).



Graph 1: - Type of thyroid disorder in the thyroid group.

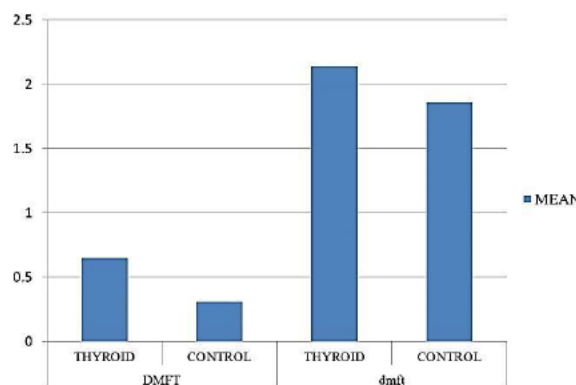
Mean value for DMFT and dmft score of thyroid group (0.65 and 2.14, respectively) were higher than the control group (0.31 and 1.86 respectively) but there was no significant difference observed between two groups (Table 2 and Graph 2).

Higher mean gingival index and plaque index scores were recorded in the thyroid group (1.316 and 0.876, respectively) compared to the control group (0.763 and 0.340, respectively) and the difference in the mean gingival index and plaque index between the two groups was found

to be statistically significant with P value < 0.001 (Table 3 and Graph 3).

PARAMETER	GROUP	MEAN	STD. DEV	S.E OF MEAN	MEAN DIFE.	Z	P-VALUE
DMFT	THYROID	0.65	1.185	0.12	0.23	-1.11	0.215
	CONTROL	0.31	0.644	0.064			
dmft	THYROID	2.14	2.121	0.212	0.26	0.711	0.31
	CONTROL	1.86	2.086	0.203			

Table 2: - Comparison of dmft and DMFT indices between the thyroid and control groups

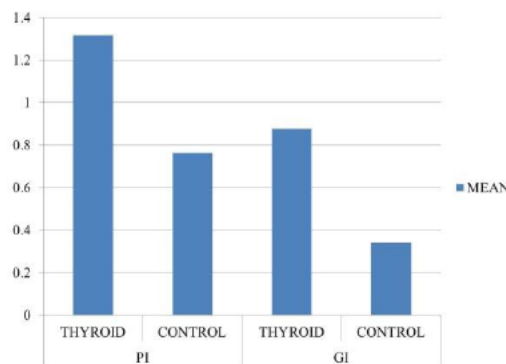


Graph 2: - Comparison of mean DMFT and mean dmft between two groups

PARAMETER	GROUP	MEAN	STD. DEV	S.E OF MEAN	MEAN DIFE.	Z	P-VALUE
PI	THYROID	1.316	0.616	0.062	0.432	-4.854	<0.001*
	CONTROL	0.763	0.461	0.046			
GI	THYROID	0.876	0.623	0.061	0.426	-3.243	<0.001*
	CONTROL	0.34	0.373	0.04			

P - value <0.001 = Statistically significant

Table 3: Comparison of plaque index and gingival index



Graph 3: - Comparison of mean Plaque Index and Mean Gingival Index between two groups

Discussion

The endocrine system is responsible for hormonal secretion and is strongly related to the central nervous system, as it diversifies its functions through the hypothalamus and pituitary. It controls physiological processes and maintains homeostasis.¹¹ The neuroendocrine system is responsible for adaptation to environmental changes. Also, a function of the nervous system is to provide a correct organic response. Its response may be primary, with the release of neurotransmitters, or if the stimulus prevails, the endocrine system secretes hormones. It holds importance in dentistry as well because many of the patients attending the dental clinics face stressful situations.⁴

Congenital hypothyroidism (CH) is the most common metabolic disorder found in the newborn. In the present study, we observed that out of 100 children, 73% children suffered from CH. This data was comparable with the study done by Desai *et al.* who also found high prevalence (78%) of CH.¹²

In the present study, the plaque and gingival scores were significantly higher in the study group (0.987 and 1.417, respectively) compared to that in the control group (0.450 and 0.847, respectively) with statistically significant P-value <0.001. These results are similar to the findings obtained by Yamana *et al.* who stated that moderate type of gingival inflammation was found to be the most common among the patients with thyroid dysfunction.¹³

Similar results were also obtained by Kadhim *et al*¹⁴ who found that the patients with thyroid disorders have poor periodontal health and had more clinical attachment loss compared with healthy individuals. Obtaining an understanding of thyroid dysfunction is of significant importance to the pedodontist/ public health dentist for two reasons. Firstly, they may be the first to suspect a serious thyroid disorder and hence help in early diagnosis and hence prevention of its serious consequences. Thus, as part of a health care team, a pedodontist/ public health dentist plays an important role in detecting/screening of thyroid abnormalities. The second reason is to avoid possible dental complications resulting from treating patients with the thyroid disorders. A pedodontist/ public health dentist can modify his/her treatment plan while treating patients who have thyroid disease.¹

The thyroid is extremely sensitive to radiation, and excessive radiation exposure is a known risk factor for various thyroid conditions. So, the dentists may also play a vital role in preventing the occurrence of thyroid disease among their patients. One way the dental professional can protect the thyroid gland is to use a thyroid collar while taking patient Xrays.¹⁵ Patients who have thyroid disease present a treatment challenge to dentists. Awareness of the condition and current stage of treatment is important in understanding the possible modifications needed for dental treatment. Length and current state of therapy are important in understanding the metabolic control of patients.³ The main complications of patients with hyperthyroidism and

hypothyroidism are associated with cardiac comorbidity. Consultation with the patient's primary care physician or an endocrinologist is warranted if any sign or symptom of thyroid disease is noted on examination. Oral health care provider possesses many responsibilities for such patients which include stress reduction, awareness about the side effects of drugs and vigilance for appearance of signs or symptoms of hormone toxicity. Moreover, dental professionals have a responsibility to be aware of the different dimensions of the disease and treatment that could affect a patients suffering from thyroid problems.³

In the present study, the mean DMFT and dmft values in the thyroid group were 0.65 and 2.14, respectively whileas the mean DMFT and dmft scores were 0.31 and 1.86, respectively in the control group. When compared to the control group mean values of both DMFT and dmft were higher in the thyroid group but the difference was not statistically significant. These findings were similar to the previous study conducted by Yamana *et al.* wherein they also found the higher value of DMFT in the adult thyroid group compared to the control group with statistically a non-significant difference.¹³

Conclusion

It was concluded that oral health status of children suffering from thyroid disorders was deteriorated when compared to the oral health status of healthy subjects. Hence, it becomes an obligation for the dentists especially the pediatric dentists to identify the thyroid disorders among their patients so as to modify the treatment modalities accordingly.

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