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Comparison of Oral Manifestations in Patients with Hyperthyroidism and Hypothyroidism in Outpatient Clinic of Razi Hospital in Rasht City in 2018

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ABSTRACT

Background and aim: Comparison of oral manifestations in patients with hyperthyroidism and hypothyroidism in an outpatient clinic of Razi Hospital in Rasht City.

Materials and methods: This descriptive-analytical study was performed on 121 patients with hypothyroidism and 55 patients with hyperthyroidism referred to an outpatient Clinic of Razi Hospital in Rasht City under the supervision of an endocrinologist. Patients' information was recorded in a questionnaire after the oral examination. Data were described by using SPSS 22.

Results: The mean age of patients in this study was 44.3±13.7 years. 47.1% of hypothyroidism and 21.8% of hyperthyroidisms had a congress tongue ($p<0.0001$). Macroglossia was 43.8% in hypothyroidism and 14.5% in hyperthyroidism patients (approximately 3 times) ($p <0.0001$). Only 5% of hypothyroid patients were oral lichen planus, while none of the hyperthyroidisms had oral lichen planus ($p=0.101$).

Conclusion: As discussed in this study, oral manifestations in thyroid patients, especially hypothyroidisms, were observed. They considered the possibility of manifestations such as lichen planus, xerostomia, and knowledge of recognizing the clinical signs of these lesions. The interaction between dentists and endocrinologists, accurate follow up of these patients, and control of their complications and considerations during work with these patients to prevent the possible complications should be paying attention.

1. Introduction

The thyroid is the primary regulator of metabolism and affects all functions of the body. Thyroid dysfunction is the second most common endocrine disorder that can affect anybody's system, including the mouth. The oral cavity is affected by excessive or deficient hormones.[1] By identifying the initial symptoms of the thyroid, the dentist can refer the patient to medical diagnosis and treatment and limit the potential side effects of uncontrolled treatment.[2] Thyroid dysfunction is essential in dentistry for two reasons. First, the dentist may be the person to deal with a severe thyroid disorder and can help with early diagnosis. The second reason is that possible complications from the treatment of patients are prevented.[3] Early diagnosis of disease plays an essential role in the success of clinical treatment. Also, the success of disease, especially in early stages, may reduce the harmful effects on the patient's health, help prevent them, or delay postmortem complications.[4] The thyroid gland is one of the largest endocrine glands that consists of two lobes located on both sides of the trachea. The thyroid gland-associated hormones produced by this gland are thyroxine (T4) and triiodothyronine (T3).[5] The thyroid gland also synthesizes the calcitonin hormone.[1] 90% of the hormone produced by tuberculosis, T4 and approximately 10%, is T3. Since T3 is an active hormone that attaches to the thyroid hormone receptor and causes many physiological functions of the thyroid hormone, T4 should be converted to T3. The thyroid hormones secretion is regulated by the regulation of thyroid-stimulating hormones (TSH), which is regulated by the Thyrotropin-releasing hormone (TRH) hypothalamic hormone.[4] Approximately 15 minutes after TRH secretion, the amount of TSH secretion is maximized. Reducing the levels of thyroid hormones increases TSH production and exacerbates the TRH stimulation effect on TSH. Increasing levels of thyroid hormones also rapidly and directly inhibit TSH and inhibit the TRH hyperthyroidism:

The manifestations of hyperthyroidism are diverse and include the following:

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- Increases heart rate following everybody tasks
- Mild increase in blood pressure
- Severe irritability
- Increases sweating and sensitivity to heat
- Muscle weakness, especially in the shoulder, pelvis, and thighs
- Tremors and tremors (especially in the hands and fingers)
- Weight loss despite a good appetite
- Hair loss
- The nail is removed from the bed
- Swelling of the fingertips (clubbing)
- Pulling the upper eyelid downwards
- Change in the thickness of the skin
- Increased gastrointestinal movements stimulating effect on TSH. This shows that thyroid hormones are the primary regulator of TSH production.

The most common causes of overproduction of thyroid hormones are the autoantibodies of TSH stimuli (thyroid disease) and thyroid hormone secretion nodules (toxic nodules). The classic feature of Graves' disease or hyperthyroidism is "gaze," with eye evaporation due to the deposition of glycosaminoglycans in the eye muscles. Oral manifestations of thyrotoxicosis include increased ability to decay, periodontal disease, enlarged extracellular tissue and lacrimal thyroid tissue (mainly in the posterior side of the tongue), the hardness of swallowing, maxillary or mandibular osteoporosis, premature tooth decay and burning of the mouth.[3] Methimazole and Propyl Tiorazyl (PTU) drugs have been used to treat hyperthyroidism for more than half a century. Propylthyrosilicemia can lead to the formation of salivary gland stones and increase the anticoagulant effect of warfarin,[1] hypoprothrombinemia and bleeding.[4] Fluoride may be used as a medicine for hyperthyroidism due to fluoride's ability to imitate thyrotropin (TSH) due to the ability to reduce thyroid activity.[1] Hyperthyroidism is one of the most common thyroid disorders[6] among post-diabetes endocrine disorders. The most commonly found hypothyroidism, macroglossia, taste disorder, delayed tooth eruption, poorly periodontal condition, modified morphology of the tooth, and improvement of late wounds[8] are due to decreased metabolic activity fibroblasts.[1] The most common symptom of hypothyroidism in the neonate, the largeness of the tongue, hypotonia (low activity and mobility), and late closure of the fontanelles[12], thick lips, malocclusion, and late teeth[1], and there may also be respiration and secondary hyperplasia.[6]

If congenital hypothyroidism is not diagnosed, it can cause the following complications:

- Mental retardation
- Deafness
- Goiter (enlarged thyroid gland)
- Heart disease
- Psychological problems
- Peripheral neuropathy
- Congenital disabilities[7]

The alveolar bone analysis is the most important clinical parameter used to evaluate the periodontal disease's severity. Differences in blood levels of T3 and T4 may be considered a moderating factor in chronic periodontitis. Although both thyroid disorders affect periodontal tissues. They have inflammatory mediators such as cytokines, but hyperthyroidism exhibits pronounced periodontal degeneration more than hypothyroidism.[9] Lichen planus, chronic inflammatory disease of the mucosal skin is dependent on T lymphocytes.[6,10] Lichenoid reactions include a group of lesions or various etiologies, but with a common clinical and histological profile. Oral lichenoid responses include lichen planus, lichenoid contact reactions, lichenoid drug rashes, and graft versus host disease (GVHD) leukocytic reactions. OLP's exact cause is unknown, but one of the most accepted theories is that T-reactive lymphocytes play an essential role in the development of oral lichen planus. Recent studies suggest a higher autoantibody titer different types of serum ions, including thyroid antibodies, are in oral lichen planus patients. The oral lichen planus has a bilaterally symmetric pattern in which the buccal mucosa is the most common site, but it can also be involved in any other oral mucosa.[10,11]

2. Materials and methods

Entrance criteria: People with hyperthyroidism and hypothyroidism. Exitance criteria: Pregnant women, subjects with a history of thyroidectomy, head and neck radiotherapy, as well as syndromes or major language diseases such as amyloidosis, neoplasms, Down syndrome, and Beckwith Wiedemann syndrome, people with a history of ailments skin-mucosal lesions such as mammalian mammal pemphigoid, lichenoid reactions to drugs.

- Failure to record any systemic disease, such as diabetes mellitus, rheumatoid arthritis, will only be investigated and recorded.

In determining the sample size of patients in 2 groups of hyperthyroidism and hypothyroidism with 90% confidence and 90% strength, the number of at least 52 subjects was obtained.[12] This study was carried out at the Research Committee of the Faculty of Dentistry of Guilan and the IR. GUMS.REC.1396.426 Code of Ethics was approved by the University's Ethics Committee. A total of 121 patients with hypothyroidism, two of which were controlled and uncontrolled by TSH. Fifty-five patients with hyperthyroidism referred to the outpatient clinic of the Razi Hospital's endocrine system under the supervision of ultrasound specialists were included in the study after obtaining consent letters. The demographic data of individuals, including personal profile, age, and sex, were recorded. All dental samples, flashlights, and abslange were used to complete the questionnaire in terms of oral lichen planus. Confirm the clinical diagnosis of oral lichen planus. Reticulocyte retinal tissue is considered thin white or sterile lines in the form of mesh or rings, and the papular type is necessary as small white dots. Other types of lichen planus, erythematous, ulcerative, bullous, and Plaque. To find these lesions, the most common areas, including buccal mucosa, and the tongue and anterior gingiva, and then other areas of the oral mucosa, were examined first. In case of observation of the lesion in the designed image, lingual surfaces in the questionnaire, the letter was registered. The collected data were recorded using SPSS 22 software, and detailed charts were used to describe the results. Chi-square test and logistic regression were used to determine the correlation and comparison of the groups.

3. Results

According to Table1, based on Chi-Square Test, samples were 79% (139 persons) women and 21% (37 persons) were male. The percentage of women in the hypothyroidism group was 86%, and the group of hyperthyroidism was 63.6%, which was statistically significant ($p = 0.001$). The mean and standard deviation of the patients was 44.3 ± 13.7. The mean of PATs was 45.8 ± 13.1 years and 40.9 ± 14.6 years for hyperthyroidism, and this difference was not statistically significant ($p = 0.028$).

Table 1. Age and sex characteristics of the studied samples.

		Patient group						
		Hypothyroidism		Hyperthyroidism		Total		
		Number	Percent	Number	Percent	Number	Percent	P*
Age	Under 30 years	19	15.7%	15	27.3%	34	19.3%	0.028
	30 to 50 years	55	45.5%	25	45.5%	80	45.5%	
	Upper 50 years	47	38.8%	15	27.3%	62	35.2%	
	Total	121	100%	55	100%	176	100%	
Age		45.84±13.09		40.96±14.59		44.32±13.72		
Sex	Male	16	14%	20	36.4%	37	21%	0.0001
	Female	105	86%	35	63.6%	139	79%	
	Total	121	100%	55	100%	176	100%	

Based on the Chi-Square Test, 5% of patients with hypothyroidism were lichen planus; this percentage was zero in the hyperthyroid group (p = 0.101). This difference was not statistically significant.

Table 2. Frequency of oral lesions in two patient groups.

		Patient Group						P*
		Hypothyroidism		Hyperthyroidism		Total		
		NO	Yes	NO	Yes	No	Yes	
The presence of oral lichen planus	Number	115	6	55	0	170	6	0.101
	Percentage	95%	5%	100%	0%	96.6%	3.4%	

Based on the data obtained from Table 3, there was no statistically significant difference in two groups of hypothyroidism and hyperthyroidism (p = 0.623).

Table 3. DMFT levels in two groups of hypothyroidism and hyperthyroidism.

	Patient Group	N	Mean	Std. Deviation	P
DMFT	Hypothyroidism	121	11.94	6.83	0.62300
	Hyperthyroidism	55	11.38	7.33	---

According to Fisher's data, according to the Fisher test, the percentage of lichen planus lesions in patients with uncontrolled TSH was 3.7% (2 cases). In control, patients were 6% (4 patients), which was not statistically significant (p = 0.447).

Table 4. Comparison of oral lesions in two groups of hypothyroid patients with controlled and uncontrolled TSH.

		TSH				
		Uncontrolled TSH		Controlled TSH		
		No	Yes	No	Yes	P
The presence of oral lichen planus	Number	52	2	63	4	0.447
	Percentage	96.3%	3.7%	94%	6%	---

According to Table 5, according to Pearson Chi-Square Test, lichen planus lesions in hypothyroid episodes were 3.8% (4 subjects) and 11.8% (2 males), while in the hyperthyroid group it was not. The difference is not statistically significant (p = 0.198).

Table 5. Comparison of oral lesions in two groups of patients based on gender.

			Patient Group					
			Hypothyroidism			Hyperthyroidism		
			Sex			Sex		
			Male	Female	P	Male	Female	P
The presence of oral lichen planus	No	Number	15	100	+	20	35	+
		Percentage	88.2%	96.2%	0.198	100%	100%	---
	Yes	Number	2	4	---	0	0	---
		Percentage	11.8%	3.8%	---	0.0%	0.0%	---

According to the data of Table 6, based on Chi-Square Test, lichen planus lesions in the hypothyroid group were found in 6.3% (2 patients) in the range of 50-50 years and 8.5% (4 patients) at the age of 50 years were not statistically significant (p = 0.821).

Table 6. Prevalence of oral lesions in two groups of patients based on age.

			Patient Group							
			Hypothyroidism				Hyperthyroidism			
			Age				Age			
			Under 30 years	30 to 50 years	Upper 50 years	P	Under 30 years	30 to 50 years	Upper 50 years	P
The presence of oral lichen planus	No	Number	19	53	43	---	15	25	15	---
		Percentage	100%	96.4%	91.5%	---	100%	100%	100%	--
	Yes	Number	0	2	4	0.101	0	0	0	---
		Percentage	0.0%	3.6%	8.5%	---	0.0%	0.0%	0.0%	---

Based on the data of this Table, the mean DMFT between women (11.5 ± 6.3) and men (14.5 ± 9.3) was not statistically significant (p = 0.01) in patients with hypothyroidism. Also, the DMFT index in women (10.9 ± 6.7) and men (12.1 ± 8.5) in hyperthyroid patients was not statistically significant (p = 0.558).

Table 7. Mean and standard deviation of DMFT in 2 patient groups by age.

Descriptive					
DMFT					
Patient Group		N	Mean	Std. Deviation	P
Hypothyroidism	Under 30 years	19	7.8421	4.15349	0.00010
	30 to 50 years	55	10.7273	4.39045	---
	Upper 50 years	47	15.0213	8.60103	---
	Total	121	11.9421	6.83166	---
Hyperthyroidism	Under 30 years	15	7.4667	3.15926	0.01000
	30 to 50 years	25	11.3200	7.03397	---
	Upper 50 years	15	15.4000	8.90265	---
	Total	55	12	7.33962	---

Based on the data of Table 8, DMFT in terms of sex in both groups of hypothyroidism and hyperthyroidism is not statistically significant (p <0.05).

Table 8. Mean and standard deviation of DMFT in two groups of patients by sex.

Group Statistics						
		Sex	N	Mean	Std. Deviation	P
Hypothyroidism	DMFT	Male	17	14.4706	9.32146	0.10000
		Female	104	11.5288	6.29680	---
Hyperthyroidism	DMFT	Male	20	12.1000	8.48466	0.58800
		Female	35	11	6.69717	---

According to Table 9, the frequency distribution of occlusion class in terms of age groups in both hypothyroid and hyperthyroid groups is not statistically significant (p <0.05).

Table 9. Malocclusion in two groups of patients by age.

Patient Group				Occlusion Type				Total	P
				Class I	Class II Div I	Class II Div II	Class III		
hypothyroidism	Age	Under 30 years	Count	17	1	1	0	19	0.37
			% within Occlusion Type	17.7%	33.3%	10%	0%	15.7%	---
		30 to 50 years	Count	44	2	4	5	55	---

			% within Occlusion Type	45.8%	66.7%	40%	41.7%	45.5%	---
		Upper 50 years	Count	35	0	5	7	47	---
			% within Occlusion Type	36.5%	0%	50%	58.3%	38.8%	---
	Total		Count	96	3	10	12	121	---
			% within Occlusion Type	100%	100%	100%	100%	100%	---
hyperthyroidism	Age	Under 30 years	Count	13	0%	2	0	15	0.31
			% within Occlusion Type	30.2%	0%	66.7%	0%	27.3%	---
		30 to 50 years	Count	19	1	1	4	25	---
			% within Occlusion Type	44.2%	50%	33.3%	57.1%	45.5%	---
		Upper 50 years	Count	11	1	0	3	15	---
			% within Occlusion Type	25.6%	50%	0%	42.9%	27.3%	---
	Total		Count	43	2	3	7	55	---
			% within Occlusion Type	100%	100%	100%	100%	100%	---
Total	Age	Under 30 years	Count	30	1	3	0	34	---
			% within Occlusion Type	21.6%	20%	23.1%	0%	19.3%	---
		30 to 50 years	Count	63	3	5	9	80	---
			% within Occlusion Type	45.3%	60%	38.5%	47.4%	45.5%	---
		Upper 50 years	Count	46	1	5	10	62	---
			% within Occlusion Type	33.1%	20%	38.5%	52.6%	35.2%	---
	Total		Count	139	5	13	19	176	---
			% within Occlusion Type	100%	100%	100%	100%	100%	---

According to the data of Table 10, the frequency distribution of the occlusion class in terms of sex in the hypothyroid and hyperthyroid groups is not statistically significant ($p < 0.05$).

Table 10. Frequency of malocclusion in two groups of patients by sex.

Patient Group				Occlusion Type				Total	P
				Class I	Class II Div I	Class II Div II	Class III		
hypothyroidism	Sex	Male	Count	11	0	2	4	17	0.13
			% within Occlusion Type	11.5%	0%	20%	33.3%	14%	---
		Female	Count	85	3	8	8	104	---
			% within Occlusion Type	88.5%	100%	80%	66.7%	86%	---
	Total		Count	96	3	10	12	121	---
			% within Occlusion Type	100%	100%	100%	100%	100%	---
hyperthyroidism	Sex	Male	Count	15	0	1	4	20	0.52
			% within Occlusion Type	34.9%	0%	33.3%	57.1%	36.4%	---
		Female	Count	28	2	2	3	35	---
			% within Occlusion Type	65.1%	100%	66.7%	42.95	63.6%	---
	Total		Count	43	2	3	7	55	---
			% within Occlusion Type	100%	100%	100%	100%	100%	---
Total	Sex	Male	Count	26	0	3	8	37	---
			% within Occlusion Type	18.7%	0%	23.1%	42.1%	21%	---
		Female	Count	113	5	10	11	139	---
			% within Occlusion Type	81.3%	100%	76.9%	57.9%	79%	---
	Total		Count	139	5	13	19	176	---
			% within Occlusion Type	100%	100%	100%	100%	100%	---

4. Discussion

Since thyroid disorder is the second most common endocrine system disorder, especially in females[2], the dentist should be aware of these patients' oral manifestations before starting treatment of thyroid patients. This awareness is essential for two reasons in the field of dentistry. First, the dentist may be the first person to have a severe thyroid disorder and can help diagnose it early. Second, it can prevent potential complications from the treatment of patients.[3] The results of the present study in terms of sex distribution were similar to those of Jairo Robledo-sierra,[16] and Maria Siponen[15], all of which confirmed the higher incidence of thyroid dysfunction in men. While the mean age of Jairo Robledo-sierra[16] and Maria Siponen[15] were different from the present study, this difference may be due to lifestyle differences and differences in the prevalence and incidence of diseases in the regions. Different geographies of different ages are known.[13] One of the most challenging lesions examined in this study was oral lichen planus. However, various etiologies have been elucidated, and the exact etiology remains unclear. Previous studies have suggested that T lymphocytes themselves and titer high serum autoantibodies, including thyroid antibodies, may play a role in its pathogenesis.[13] In the present study, only 5% (n = 6) of hypothyroid patients were affected. At the same time, these conditions were not observed in any hyperthyroid patients, although this difference was not statistically significant (p = 0.011). However, a similar study by Robledo-Sierra et al.[16] in their 2015 study reported a significant incidence of thyroid disease in patients with oral lichen planus compared to the control group. While in the studies of Lorenzo Muzio et al.[14] in 2013 and Maria Siponen et al.[15] in 2010, no significant relationship between oral lichen planus and thyroid disease was found. Given the accepted etiology of autoimmunity for both lichen planus and Hashimoto's thyroiditis, some previous studies have suggested genetic susceptibility and specific HLAs in these disorders. Although a limited number of patients with oral lichen planus in this study, it was not possible to clinically evaluate these lesions, it was clinically significant that all lesions had reticular and papular components with less erythematosus and only one. They were symptomatic and had a history of topical corticosteroid use. Also, the difference between the untreated and controlled hypothyroid populations was not significant. However, in the J-Robeldo sierra study, patients with oral lichen planus without levothyroxine compared with patients with oral lichen planus who consumed levothyroxine revealed lichen planus erythematosus lesions and more severe symptoms.[16] Patients in the study were also evaluated by age and gender, and no statistically significant difference was found between them. One of the positive points of the present study was the high number of hyperthyroid patients compared to other studies and the evaluation of the duration of the disease. This difference was statistically significant (p = 0.0001). A shorter duration of hyperthyroidism can be attributed to a more severe manifestation of the disease, followed by a faster referral and diagnosis.

5. Conclusion

As in this study, oral manifestations in thyroid patients, especially hypothyroid patients, were observed. They were considering the possibility of manifestations such as lichen planus, dry mouth, knowledge of the recognition of the clinical signs of these lesions. The interaction of the dentist and endocrinologist, accurate follow up of these patients, control of their complications and considerations while working with these patients to prevent the occurrence of possible complications should be considered.

Conflict of Interest

The authors declared that there is no conflict of interest.

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