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Evaluation of Dermal Symptoms in Hypothyroidism and Hyperthyroidism

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Abstract: Many symptoms arise in thyroid diseases. The aim of this study was to evaluate the dermal symptoms in hypothyroidism and hyperthyroidism. In this cross sectional study, 120 patients with hyperthyroidism and 50 patients suffering from hypothyroidism were studied. Cutaneous, hair and nail clinical symptoms were studied and registered in a special questionnaire. Mean age of patients suffering from hypothyroidism and hyperthyroidism were 38.24±14.45 and 25.86±14.69 years old. Dry and Coarse/rough skin were the most prevalent manifestations in the skin involvement in hypothyroidism since softness was the most prevalent ones in hyperthyroidism. Fragileness was the most prevalent symptom in patients with nail involvement in hypothyroidism since soft skin was the most prevalent ones in hyperthyroidism. Coarse/rough skin was observed more in patients with hair involvement in hypothyroidism since the most prevalent ones was separation of nail from its bed in hyperthyroidism. High prevalence of skin, hair and nail symptoms in thyroid patients, early diagnosis of the signs may be helpful in premature diagnosis and treatment of thyroid diseases.

Key words: Dermal symptom, hypothyroidism, hyperthyroidism, thyroid diseases, skin

INTRODUCTION

Thyroid diseases are regarded the most common disorder of endocrine glands all over the world. Hypothyroid and hyperthyroid are of the most common thyroid diseases (Haenssl *et al*., 2011). Thyroid hormones (T_3-T_4) affect most of body tissues and result in increasing of protein synthesis and their metabolic activity (Doliger *et al*. 1995). In fact, none of body tissues or organs including skin and its appendixes which are evidently affected by these two diseases and develop different clinical manifestations is safe of mal effects of thyroid hormones decrease or increase (Melish, 1990). These symptoms may be developed in diseases revolve and in all age groups. Cutaneous signs and symptoms and its appendixes in hypothyroid and hyperthyroid are of significant findings of these diseases and can be easily diagnosed through examination. They are really valuable in diagnosis, response to treatment and follow-up of the patients (Jabbour 2010; Safer *et al*. 2003). Hypothyroidism is a syndrome resulting from insufficiency of thyroid hormones and lead to slowness of most phenomena in body. It is more common among middle-aged and old persons (Matsuoka *et al*., 1985). The coarse face, thin eyebrows, xerosis and yellow skin can be referred as the most important symptoms of the disease resulting from carotene accumulation in ceratoid layer due to decrease of speed to change carotene to vitamin A (Fink *et al*., 1967). Body hair fall and head hair change to dry, coarse and rough. Anemia is resulted due to decrease of erythrocytes production and the patient seems pale (Sehgal, 2011). Hair of body, face and genital area are typically dry, coarse and fragile. The hair dispersedly fall and fall of external one-third of eyebrows are more common (Saadia *et al*., 2010). Myxedema is seen in 18-50% of patients. Nails become thick and fragile and grow slowly. Striped nails and rarely onicolisis (separation of nail from its bed) are other nail symptoms (Andrade Junior *et al*., 2010). Hyperthyroidism is a syndrome resulting from concentrating of thyroid hormones on environmental tissues. General symptoms of hyperthyroidism include nervousness, weight loss in spite of appetite increase, intolerance of heat, increase of skin perspiration to lose more heat produced in body which is warm and wet. Vitiligo is a self-immune disorder observed in a group of patients suffering from grieves (Paul *et al*., 2005). Xerosis is seen very rarely and the skin is often warm, moisturized and soft. Skin warmness results from increase of skin blood circulation. Dilation of environmental vessels leads to face inflammation and erythema of palms (Zhang *et al*., 2010). Increase of body general perspiration is sometimes seen but palms and soles are more involved. Epidermis is thin but not atrophic. Sometimes, the skin becomes hyper pigmented which is seen in 10% of the patients. It is usually dispersed. Head hair is thin and soft. Slight dispersed alopecia (rarely severe) and canitis are sometimes observed (Gozke *et al*., 2007). Nail changes may be seen in 15% of patients with hyperthyroidism. Plamer nail is diagnosed with nail concave plate or onicolisis. The nails are flat, irregular and dark . Other changes include vitiligo

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(7%) and whiteness of nail plate (Rasi and Tajziechi, 2008). According to discrepancy between previous studies the aim of this study was to evaluate the dermal symptoms of hypothyroidism and hyperthyroidism.

MATERIALS AN D METHODS

In this cross sectional study that was conducted during a two-year period, 120 patients with hyperthyroidism and 50 patients suffering from hypothyroidism that referred to skin and glands clinic or private offices were examined and cutaneous, hair and nail clinical symptoms were studied and registered in a special questionnaire. Written consent was obtained from all the patients. This study was approved by ethic committee of Tabriz University of Medical Sciences. Considering that hyperthyroidism and hypothyroidism symptoms are related to disease activity and the related symptoms may be seen at any age, gender and geographical condition (rural or urban) at any time, activeness of the disease was regarded as the most important criteria to evaluate the disease (the disease was evaluated and the symptoms were registered since its diagnosis, before starting treatment or sometimes, during treatment in which the symptoms have not been controlled and are still active). The patients were examined in one session and all cutaneous, hair and nail symptoms were registered in the questionnaire at the same session of visit (of course, they were visited at the presence of oncologist and the patients have a file in glands clinic center and are under treatment). SPSS™, version 16 is the used statistical software program. The results were expressed as means standard deviations The Chi-square test was used for statistical analysis. The level of statistical significance was set at a value of $p<0.05$.

RESULTS

Hypothyroidusm: Mean age of patients suffering from hypothyroidism (n = 50) was 38.24±14.45 years old, but most of them were at 34-45 years old (60%). Considering gender, 70% of patients were female and 30% male. Skin, hair and nail clinical manifestations were showed in Table 1. Dry and coarse/rough skin was the most prevalent manifestations in the skin involvement that were observed in 35 (70%) of the patients. Fragileness was the most prevalent symptom in patients with nail involvement that was seen in 35 (70%) of the patients. Coarse/rough skin was observed more in patients with hair involvement.

Hyperthyroidism: The mean age of the patients was 25.86±14.69 years. Most patients were at third decade of their life (20-30 years old). Considering gender, the patients were constituted of (74%) female and (26%) male. Skin, hair and nail clinical manifestations have been demonstrated in Table 2. Softness was the most prevalent symptom in patients with skin involvement that was observed in 80 (66%) of the patients. Soft skin was the most prevalent symptom in patients with nail

Table 1: Cutaneous, hair and nail symptoms in patients suffering from hypothyroidism

	Skin		Nail		Hair	
Symptom	No.	%	No.	%	No.	%
Dry	35	70	-		-	
Coarse/rough	35	70	-		35	70
Cold	25	50	-		-	
Pale	21	42	-		-	
Iktiosis	18	36	-		-	
Inflated	16	32	-		-	
Myxedema	9	18	-		-	
Delay in nail regeneration	6	12	-		-	
Hyperkeratosis of palm/sole	4	8	-		-	
Purpura ecchymosis	4	8	-		-	
Carotenemia	3	6	-		-	
Telangiectasia	3	6	-		-	
Xantoma	2	4	-		-	
Perspiration decrease	2	4	-		-	
Wrinkled skin	1	2	-		-	
Fragileness	-		35	70	32	64
Slow growth	-		24	48	23	46
Thinness	-		20	40	-	
Separation of nail plate from its bed	-		19	38	-	
Striped nails	-		3	6	-	
Hair fall of exterior one third of eyebrow	-		-		19	38
Underarm hair fall	-		-		2	4
Pubes hair fall	-		-		1	2
Canitis	-		-		1	2

Table 2: Cutaneous, hair and nail clinical symptoms in patients suffering from hyperthyroidism

	Skin		Nail		Hair	
Symptom	No.	%	No.	%	No.	%
Softness	80	66	100	83	-	
Perspiration	60	50	-		-	
Heat	30	25	-		-	
Itching	20	16	-		-	
Topical hyperpigmented	15	12.5	-		-	
Vitiligo	12	10	-		-	
Dryness	10	8	-		-	
Dermatographism chronic urticaria	8	6.5	-		-	
Pretibial myxoedema	8	6.5	-		-	
Palm erythema	6	5	-		-	
Face flashing	5	4	-		-	
Velvety	3	2.5	-		-	
Dispersed hyperpigmentation	3	2.5	-		-	
Thyroid acropachy	2	1.6	-		-	
Thin	-		70	58	-	
Dispersed alopecia	-		50	41	-	
Topical alopecia	-		10	8	-	
Canitis	-		8	6.6	-	
Nail whiteness+Vitiligio	-		4	3	-	
Generalized alopecia	-		1	0.8	-	
Separation of nail from its bed	-		-		20	16.6
Increase of growth	-	-			10	8.3
Fingers clubbing	-	-			6	5
Paronychia	-	-			2	1.6

involvement that was seen in 120 (100%) of the patients. The most prevalent symptom in patients with hair involvement was separation of nail from its bed that was stated in 20 (16.6%) of the patients.

DISCUSSION

Comparing with previous studies regarding hyperthyroidism, the significant results include: vitiligo was more than usual (10%) and all were localized. Canitis was observed in 6.6% of patients rarely reported in the previous studies (Rasi and Tajziechi, 2008). Onicolisis or separation of nail from its bed was seen in 16.6% of patients which was more that what has been expected. Most patients experienced soft skin (66.6%) and hair (83.3%) when their disease was active. It was more than cases reported in the previous studies (Higuchi *et al*., 2003). There was dispersed alopecia in scalp in 41.6% of cases. It was disease symptom in two patients. Paying attention to this symptom may be warning in evaluating thyroid disease. Most patients suffering from hypothyroidism were middle-aged. In previous studies, they were often middle-aged and old (Ohtsuka *et al*., 1999). In the previous as well as our study, most patients were female. In this study, xerosis was the most common cutaneous symptom. But, inflation has been emphasized in the previous evaluations (Safer, 2011). Considering nails, fragileness and thinness of them was more prevalen (Szepetiuk *et al*., 2008). It is in contrary to the statistics of the previous studies in which thickness and fragileness of nails have been reported as the common symptoms (Peacey *et al*., 1996). Although, there have been published reports investigating the relationship between vitiligo and thyroid autoimmunity, there still exists a debate about the true association (Schallreuter *et al*., 1994. Alkhateeb *et al*. (2003) reported a study which included 2624 patients with vitiligo and found a significant increased frequency of thyroid diseases (Alkhateeb *et al*., 2003). Consistent with literature, we found vitiligo more frequently in patients with autoimmune thyroid diseases than normal population. In both hyperthyroidism and hypothyrodism patients, vitiligo was found to be higher than in the normal population. An association between diffuse alopecia and thyroid diseases was found in 60% of the cases, mainly of autoimmune origin (Jabbour and Miller, 2000) In our study, diffuse alopecia was found to be significantly higher in both hyperthyroidism and hypothyrodism patients than in the normal population. Our study results also support the relation between hyperthyroidism and vitiligo and diffuse alopecia. Chronic Urticaria (CU) and alopecia areata are the other dermatological diseases that were found to be related to thyroid diseases (Tan *et al*., 2002). Although it is generally accepted that thyroid disease is more prevalent in patients with CU than in the general population, the importance of this finding is unclear (Verneuil *et al*., 2004) reported a study investigating the association between CU and thyroid diseases and they found a higher frequency of thyroid autoantibodies in CU, while no significant frequency of CU was found in patients with/without thyroid antibodies in thyroid diseases (Verneuil *et al*., 2004). Generally, cases which are considered according to the studies and may indicate disease outbreak include: (a) Alopecia is one of the prevalent symptoms of hyperthyroidism and hypothyroidism. In patients with alopecia, complete examination and required tests should be conducted regarding thyroid so that it can be treated within some weeks after diagnosis of the problem, (b) Canitis is a sign of hyperthyroidism in patients. When less prevalent, it indicates hypothyroidism and should be considered and (c) In patients suffering from vitiligo, it is necessary to conduct laboratory and clinical evaluations regarding hyperthyroidism and hypothyroidism before starting the treatment because it may be single sign indicating the diseases.

CONCLUSION

Considering high prevalence of skin, hair and nail symptoms in thyroid patients, early diagnosis of the signs may be helpful in premature diagnosis and treatment of thyroid diseases which are of the most problematic diseases especially in Iran.

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