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RELATIONSHIP OF LIFE-STYLE AND HYPOTHYREOSIS

Medicine

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ABSTRACT

Objective: The study aim was to investigate the relationship of life-style habits and Hashimoto thyroiditis with hypothyreosis in women.
Methods: All women who had check-ups in our institution during a three-month period were assessed for Hashimoto thyroiditis with hypothyreosis. Women were also asked for life-style habits (smoking, drinking coffee and alcohol). Patients were divided into the study group with and the healthy control without hypothyreosis.
Results: Study included 267 women out of which 89 (33.3%) had Hashimoto thyroiditis with hypothyreosis. Significantly more women who drank coffee (p=0.048) and alcohol (p=0.044) had autoimmune hypothyreosis (coffee OR=1.9; alcohol OR=1.62). Leading bad/unhealthy life-style was correlated with having Hashimoto thyroiditis (p=0.029). Conversely, there were no other significant associations between autoimmune hypothyreosis and frequency and amount as well as type of alcohol drinks or smoking tobacco.
Conclusions: Consummation of alcohol and coffee as well as leading bad/unhealthy life-style can negatively impact thyroid gland functioning.

KEYWORDS

smoking, coffee, alcohol, Hashimoto thyroiditis, hypothyreosis

INTRODUCTION

Hashimoto thyroiditis is one of the most prevalent illnesses of the thyroid gland. The natural progression of Hashimoto thyroiditis leads to hypothyreosis that requires chronic treatment (1). It is well known that this autoimmune disease has multifactorial etiology with genetic predisposition (contributing with 70 - 80% to the pathogenesis) (2). However, numerous risk factors that can provoke autoimmune responses have been identified. Apart from female gender, parity and age, different environmental factors are also important for development of Hashimoto thyroiditis (3). Current literature is mostly evaluating the effect of infection and use of medications, diet and iodine intake, tobacco smoking and consummation of alcohol, coffee and tea (4). Nevertheless, the impact of life-style habits on thyroid gland functioning is still insufficiently examined and there are no studies that would take into consideration all life-style habits together.

OBJECTIVE

The aim of this study was to investigate the relationship of life-style habits and having Hashimoto thyroiditis with hypothyreosis in female population.

METHODS

This case-control study included all women who had regular dermatological check-ups in our institution during a three-month period. Women were fully clinically examined and detailed medical history was taken from every patient regarding their age, chronic and hereditary illnesses (cardiological, pulmological, endocrinological, gynecological and other) as well as their life-style habits (current tobacco smoking, how many years are they smoking, number of cigarettes per day, drinking coffee, number of coffee cups they drink daily, consummating alcohol, how many alcohol glasses/units per week and how many times during one month and what type of drinks do they consummate – soft or strong liquor). Body height and weight were measured and Body Mass Index (BMI= weight in kg / height in m^2) was calculated. Patients were divided according to the diagnosis of Hashimoto thyroiditis with hypothyreosis (presence of antibodies and hormonal misbalance) into the study group with and the healthy control without thyroid gland illness. According to having or not bad habits life-style was categorized as good/healthy (complete abstinence) and bad/unhealthy. All examined patients regularly received adequate hormone substitution therapy. Data concerning the life-style habits were statistically analyzed (descriptive statistics, χ^2 test and Spearman correlation; Odds Ratio – OR) and compared between two groups.

RESULTS

Study included 267 women out of which 89 (33.3%) had Hashimoto thyroiditis with hypothyreosis while 178 (66.7%) encompassed the healthy control group. Patients had from 18 to 70 years of age. They smoked from 2 to 40 years, maximally 2 packages of cigarettes daily (1 to 40 cigarettes). Investigated women drunk 1 to 6 cups of coffee per day, while they consummated alcohol mostly during weekends (1 to 30 times monthly). Only 15% of women consummated strong liquor. Significantly more women did not drink more than 10 glasses (units) of alcohol per week (χ^2=77.919; p=0.001). When we assessed the overall life-style of investigated women majority of them (more than 85%) had some bad habits (χ^2=145.352; p=0.001). We presented data regarding life-style habits in the whole sample and in groups of patients with and without hypothyreosis in Tables 1 and 2.

There were no significant differences between women with and without hypothyreosis regarding their BMI, duration i.e. years spent smoking, number of cigarettes smoked daily, amount of coffee (number of coffee cups daily) and alcohol (glasses per week and monthly drinking frequency) that women consummated. Hashimoto thyroiditis patients were significantly older than healthy controls (Table 1).

Significantly more women who did not drink coffee and alcohol were healthy i.e. euthyreotic. Women who had good/healthy life-style significantly less often had Hashimoto thyroiditis. On the other hand, there were no significant differences regarding the frequency and amount as well as type of alcohol drinks and smoking tobacco between women with and without hypothyreosis (Table 2).

Furthermore, we calculated the Odds Ratio for significant parameters – coffee and alcohol. In both cases OR was higher than one indicating that according to our sample results drinking coffee and alcohol can contribute to development of hypothyreosis on the basis of Hashimoto thyroiditis (OR coffee = 1.9; OR alcohol = 1.62).

When only women with Hashimoto thyroiditis were analyzed

significantly more of them did not smoke (χ^2=9.449; p=0.002), but drunk coffee (χ^2=50.438; p=0.001). There were no significant differences in number of patients concerning consummation of alcohol (χ^2=0.011; p=0.916).

Having Hashimoto thyroiditis with hypothyreosis in our sample was significantly positively correlated with women's age (ρ=0.145; p=0.018), consummation of alcohol (ρ=0,123; p=0.045) and life-style (ρ=0.133; p=0.029). Therefore, it can be seen that drinking alcohol presents the most important life-style parameters that can influence the functioning of the thyroid gland. There were no other significant correlations with remaining investigated habits (p≥0.05).

DISCUSSION

Some studies recorded a protective effect of alcohol on development and progression of autoimmune diseases among which Hashimoto thyroiditis is also being mentioned (1, 2). People who developed autoimmune hypothyroidism were found to drink less alcohol than those who are euthyroid. However, the potential mechanism of action is still not clear. Some authors believe that alcohol is an immune system modulator that can lessen the reaction of the immune system and consequently prevent autoimmune diseases (2, 3). Nevertheless, in most studies this effect is dose-dependent. A large population-based study proved that only moderate alcohol consumption (0 to 10 units/week) reduces the risk of autoimmune hypothyroidism (2, 5). Hypothyroidism was found to develop twice more frequently in alcohol abstainers and around half in people with high alcohol intake of 11-20 units/week. On the other hand, direct and irreversible toxic effects of alcohol on the thyroid gland have also been registered in literature (6). These effects can also relate to the quantity of consumption as well as other risk factors (3). In majority of studies the observed effects of alcohol were independent of the type of liquor (predominantly wine or beer consumers). Contrary, another case-control study did not confirm the significant correlation of changes in alcohol consumption and Hashimoto thyroiditis (2). Other authors also did not find significant differences in Hashimoto thyroiditis development and presentation between non-drinkers, low consumption and high consumption. According to our results, drinking alcohol presents an additional risk factor for Hashimoto thyroiditis based hypothyreosis in women (6). We did not find any significant dose-dependent effect of alcohol on thyroid gland function (neither positive nor negative). One of the explanations for these results can come from the fact that almost all examined women drink alcohol rarely and in small amounts (couple of times per month and not more than few glasses). Therefore, we have a small number of study participants in the moderate drinking group that can benefit from this habit.

Literature data imply on the reduced cancer risk in people who regularly drink significant amounts of coffee and/or green tea (7, 8). According to some case–control studies drinking coffee tends to decrease the risk of thyroid cancer. The mechanisms of action are still not completely understood. Coffee contains numerous compounds including which are known to eliminate several carcinogens, induce antiinflammatory, antiproliferative, antiangiogenic and antimetastatic effects and act as antioxidants (7, 8). It is suspected that caffeine can increases intracellular cyclic adenosine monophosphate levels, which can excerpt decrease in tumor growth (9). Nevertheless, other authors still did not manage to confirm the correlation of coffee consumption and thyroid cancer development in either men or women, regardless of their menopausal status (9). Moreover, not only that relationship of coffee drinking and thyroid is inconclusive, but the effect of coffee consumption on Hashimoto thyroiditis was assessed even less frequently and adequately. Based on the results we presented coffee drinking can contribute to development of hypothyreosis, but more studies regarding this matter are needed.

It has been known for a long time that smoking is a risk factor for Graves' disease especially for women (2). It is speculated that the reason for increased risk for Graves' disease in smokers might be due to a shift from pathogenic Th1 to protective Th2 response caused by nicotine and other compounds found in cigarettes (3). Contrary, recently some studies have shown that smoking might in some extent have protective effects on development of autoimmune hypothyreosis (10). This assumption is based on the findings that current smokers have a lower prevalence of antibodies compared to non-smokers. The effect is dose-dependent and disappears a few years after cessation of smoking (2). Cessation of smoking was found to correlate with increased risk of developing autoimmune hypothyroidism within the two first years (11). Couple mechanisms were proposed for this finding although neither of them is proved. Some believe that increased risk after cessation of smoking is caused by the thyroid follicular cells being exposed to extra iodide, others that it is due to oxidative damage caused by sudden exposure to oxygen in tissues, while the third possibility is that nicotine or other compounds in smoke dampen thyroid autoimmune activity by unknown mechanisms (11). On the other hand these effects of smoking on thyroid gland function need further assessment as some literature data as well as meta-analyses did not confirm any association between smoking and autoimmune hypothyroidism (11, 12). We also did not find any significant influence of smoking (duration and amount) on development of Hashimoto thyroiditis. Still, it should be mentioned that we did not evaluate the consequences of quitting smoking which is left be the aim of our further research.

CONCLUSIONS

Life-style habits can have significant negative impact on thyroid gland functioning in female population. Having Hashimoto thyroiditis with hypothyreosis in our study was associated with consummation of alcohol and coffee as well as with maintaining bad/unhealthy life-style.

Conflict of interest statement: Authors declare no conflict of interest.

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Table 1. Mean values of investigated parameters of women with and without hypothyreosis

Parameters	Whole sample		Hypothyreosis		Euthureosis		Between groups	
	Mean	SD	Mean	SD	Mean	SD	F	p
Age	40.25	11.65	42.65	11.54	39.04	11.55	5.789	**0.017**
Body mass index - BMI	22.19	3.18	22.33	3.15	22.12	3.20	0.256	0.613
Smoking – no of years	13.44	8.17	13.35	7.38	13.48	8.59	0.005	0.943
Smoking – cigarettes/day	13.46	8.47	13.55	7.29	13.42	9.05	0.005	0.945
Coffee –cups/day	2.33	1.01	2.29	1.12	2.35	0.94	0.201	0.654
Alcohol – no monthly	5.16	7.21	5.05	8.57	5.24	6.25	0.019	0.891
Alcohol – glasses/week	2.58	3.61	2.52	4.28	2.62	3.12	0.119	0.881

Legend: no - number; SD – standard deviation; Bold - significant

Table 2. Frequency of women regarding their life-style habits

Parameters		Whole sample		Hypothyreosis		Between groups	
		Number	Percent	no	yes	χ2	p
Smoking	no	175	65.5	116	59	0.033	0.484
	yes	92	34.5	62	30		
Coffee drinking	no	49	18.4	38	11	3.299	**0.048**
	yes	218	81.6	140	78		
Alcohol drinking	no	156	58.4	111	45	3.400	**0.044**
	yes	111	41.6	67	44		
Alcohol glasses/ week	less than 10	102	38.2	62	40	0.095	0.510
	10 and more	9	3.4	5	4		
Liquor type	beer, vine	67	25.1	42	25	0.227	0.390
	strong liquor	6	2.2	6	0		
	both	37	13.9	19	18		
Life-style	good /healthy	35	13.1	29	6	4.751	**0.020**
	bad /unhealthy	232	86.9	149	83		

Legend: Bold - significant

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