CLINICAL, HORMONAL AND IMMUNOLOGICAL CHARACTERISTICS OF HYPOTHYROIDISM DURING THE POSTPARTUM PERIOD

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ABSTRACT

Introduction: Hypothyroidism is a common manifestation of postpartum thyroiditis (PPT). This is a syndrome of transient or permanent thyroid dysfunction presenting during the first year after delivery or abortion and is mainly of autoimmune pathogenesis. Hypothyroidism in the postpartum period may occur either "de novo" or due to deterioration of preceding autoimmune thyroiditis (AIT).

Objective: To reveal the characteristics of postpartum hypothyroidism in women with and without concomitant autoimmune thyroiditis.

Patients and methods: 24 women with a new onset or worsening of hypothyroidism in the early postpartum period (mean age 30.29 years) were included in the study. 16 of patients who developed PPT had no history of AITD and 8 of them had preexisting Hashimoto's thyroiditis. Serum levels of thyroid stimulating hormone (TSH), free thyroxine (FT4), free triiodothyronine (FT3), thyroid peroxidase antibodies (TPOAb) and thyroglobulin antibodies (TgAb) were investigated and an ultrasound evaluation of the thyroid gland was performed in the first trimester of pregnancy and twice during the postpartum period.

Results: Clinically overt form of hypothyroidism was found in 68.8% of the patients without underlying thyroid pathology and in 25% of the women with concomitant AIT (p=0.043). In the remaining cases postpartum thyroid dysfunction went asymptomatic. The analysis of the functional characteristics did not show significant differences between TSH, TPOAb and TgAb values as well as thyroid volume and degree of hypoechogenicity in the patients with and without preceding AIT. At the end of the postpartum period (9 months after delivery) spontaneous restoration of euthyroid state was observed in 37.5% of the patients with "de novo" occurred hypothyroidism, which was associated with a decrease in thyroid autoantibodies levels and reversal of the ultrasound changes. In the remaining patients the persistence of hypothyroidism led to the institution of levothyroxine replacement therapy. In all patients with preceeding AIT a further deterioration of thyroid function along with a rise of thyroid autoantibodies titers was observed at the end of the postpartum period. A significant correlation between serum levels of TSH and TPOAb was established. The daily dose of replacement therapy was increased with 60 % compared to pre-pregnancy values.

Conclusion: Postpartum hypothyroidism is associated with clinically evident symptoms in a significant number of the affected women. Clinical, hormonal and immunological abnormalities in patients with and without prior AIT do not differ significantly. In patients without pre-existing thyroid disease spontaneous recovery of thyroid function is often observed. Thyroid function in women with Hashimoto's thyroiditis antedating pregnancy may deteriorate during the postpartum period requiring frequent assessment and adjustment of replacement therapy.

Key words: *hypothyroidism, postpartum thyroditis, autoimmune thyroiditis*

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Table 1. Characteristics of the studied patients.

Patients	n	%
Age (years)		
mean	30,29±0,74	
range	22-37	
Previous thyroid disease		
no	16	66,7
AIT	8	33,3
Family history of thyroid disease		
no	9	37,5
yes	15	62,5
Smoking		
no	9	37,5
yes	15	62,5
Infertility history		
no	16	66,7
yes	8	33,3
Pregnancy number		
first	8	33,3
second or more	16	66,7
Body mass index (BMI) before pregnancy	23,9±0,87	

Results: Clinically overt form of hypothyroidism was found in 68.8% of the patients without underlying thyroid pathology and in 25% of the women with concomitant AIT (p=0.043). In the remaining cases postpartum thyroid dysfunction went asymptomatic (fig.1)

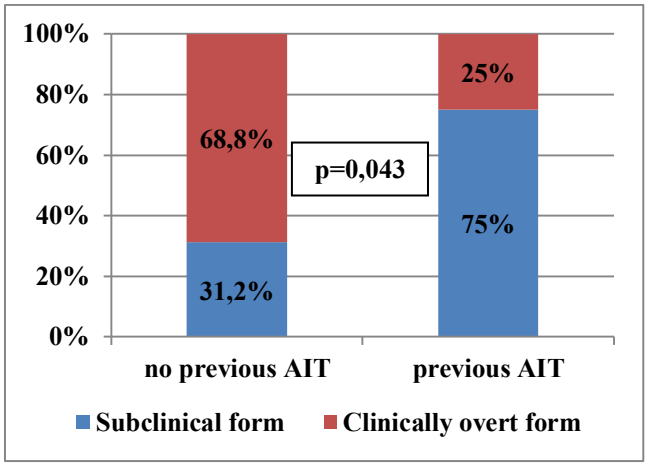

Figure 1. Distribution of the patients to according to the clinical form of thyroid dysfunction and underlying pathology.

The analysis of the functional characteristics did not show significant differences between TSH, TPOAb and TgAb values as well as thyroid volume and degree of hypoechogenicity in the patients with and without preceding AIT (tab. 2).

Table 2. Analysis of the thyroid function parameters 3 months postpartum.

Parameter		Without previous AIT	With previous AIT	P
TSH (mIU/)	$x \pm Sx$	**52,07±17,79**	**29,44±11,56**	**0,653**
F T4 (pmol/l)	$x \pm Sx$	**6,63±0,76**	**7,90±1,08**	**0,345**
F T3 (pmol/l)	$x \pm Sx$	**3,75±0,42**	**4,43±0,34**	**0,296**
TPOAb (IU/ml)	$x \pm Sx$	**430,84±94,31**	**503,14±151,90**	**0,676**
TgAb (IU/ml)	$x \pm Sx$	**23,39±12,17**	**51,56±30,66**	**0,149**
Thyroid volume (ml)	$x \pm Sx$	**13,62±1,43**	**11,93±1,23**	**0,453**
Grade of hypoechogenicity				**1,000**
	moderate	**4**	**2**	
	severe	**12**	**6**	

By the end of the postpartum period (9 months after delivery) spontaneous restoration of euthyroid state was observed in 37.5% of patients with "de novo" occurred hypothyroidism. Normalization of hormonal values was accompanied by a reversal in the immunological and morphological changes - decrease in TPOAb titers and improving the grade of hypoechogenicity of the thyroid parenchyma (tab. 3).

Table 3. Comparison between thyroid function parameteres 9 months after delivery in patients without prior AIT .

Parameter	Euthyroid (n=6)	Hypothyroidism (n=10)	P
TPOAb (mIU/l) $x \pm Sx$	**133,70±70,82**	**494,38±114,56**	**0,031***
TgAb (mIU/l) $x \pm Sx$	**3,88±2,26**	**50,60±37,29**	**0,513**
Thyroid volume (ml) $x \pm Sx$	**10,13±0,72**	**9,37±1,27**	**0,368**
Grade of hypoechogenicity			
mild	**6**	**4**	**0,034***
moderate	**0**	**10**	

In the remaining patients the persistence of hypothyroidism led to permanent replacement therapy with levothyroxine and the initial dose was determined in relation to the severity of the clinical symptoms and laboratory abnormalities.

All patients with prior AIT had persistent functional disorders by the ninth month following delivery and increase of thyroid autoantibody titers was observed. A significant correlation between the levels of TSH and thyroid autoantibodies (r=0,874; p=0,005) was established. The dose of levothyroxine was increased by 60% compared to that before pregnancy.

Discussion

The physiological suppression of the immune response during pregnancy is accompanied by improvement in concomitant autoimmune diseases. In the period after the delivery the immunological rebound phenomenon can lead to new onset or deterioration of pre-existing autoimmune thyroid disease leading to development of postpartum thyroid dysfunction (5). In patients with AIT prior to pregnancy the risk of PPT is increased (7,1). The type and evolution of hormonal abnormalities do not differ from the classical course of PPT and thyroid dysfunction may present either as thyrotoxicosis or hypothyroidism due to the exacerbation of the underlying autoimmune destructive processes.

Postpartum hypothyroidism occurs with overt clinical symptoms in a significant number of the affected patients (2). In women with AIT who developed PPT as a result of exacerbation of underlying autoimmune disorder, clinical manifestations can be masked due to the intake of levothyroxine (3). The results of our analysis indicate that clinically overt form of postpartum hypothyroidism was observed in the majority of women who developed thyroid dysfunction "de novo". In patients with prior AIT hormonal abnormalities occur mainly subclinically and may remain unrecognized.

Hypothyroidism in the postpartum period is characterized by pronounced alterations in thyroid laboratory and morphological parameters. In all patients of the studied group thyroid dysfunction developed with positive titers of thyroid antibodies and ultrasound changes of the thyroid gland seen as a grade of hypoechogenicity. The analysis showed no significant differences between the values of TSH and thyroid hormones, the levels of antibodies and thyroid ultrasound changes in patients with and without prior AIT. Higher levels of TSH were observed among women with newly developed thyroid dysfunction than those with pre-existing AIT (55,07 vs 29,44 mIU / l), but the difference was not statistically significant.

Postpartum thyroid dysfunction is usually transient and the majority of women recover their euthyroid state by the end of the first postpartum year (6). However, even after the resolution of hypothyroid phase changes in the ultrasound appearance of the gland and in radioiodine uptake can be observed. These abnormalities reflect the underlying chronic autoimmune thyroiditis leading to

the development of long-lasting hypothyroidism in up to 64 % of affected women on long-term follow-up (4). The results of this study showed persistence of thyroid functional disturbances at the end of the first year after delivery in 75% of cases. The prolonged thyroid dysfunction required initiation or increase in the dose of substitution therapy in order to ensure euthyroid state.

Conclusion

Postpartum hypothyroidism is associated with clinically evident symptoms in a significant number of the affected women. Clinical, hormonal and immunological abnormalities in patients with and without prior AIT do not differ significantly. In patients without pre-existing thyroid disease spontaneous recovery of thyroid function is often observed. Thyroid function in women with Hashimoto's thyroiditis antedating pregnancy may deteriorate during the postpartum period requiring frequent assessment and adjustment of replacement therapy.

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