Abstract

Background: Hyperthyroidism is commonly the target of an autoimmune attack in cases of thyroid-specific or non-organ-specific autoimmune disorders. Hashimoto’s thyroiditis (HT) is likely to affect ovarian function and diminish ovarian reserve. The aim of the study was to assess ovarian reserve in young women with HT using the evaluation of:

1. classical hormone methods (FSH, E2, Inh B) as a measurement of AMH.
2. AMH levels.

Methods: There were 21 patients treated due to Hashimoto disease, median age 15.6 years, and 17 healthy age-matched controls included in the study. In the group of patients with HT, 8 patients have additional TPO-Ab diagnosed, so they presented with type 2 autoimmune polyendocrinopathy (APS). In all participants, FSH, LH, estradiol, PRL, SHBG, Inh B, and Inh A were measured in the follicular phase of the menstrual cycle.

Results: As well FSH, E2, and Inh B, as AMH levels did not differ statistically between group of patients with HT and healthy controls. Moreover we did not find any differences regarding parameters assessing ovarian function and reserve between patients with only HT and those with APS. Moreover levels of LH, SHBG, PRL, and FSH did not differ in patients with HT, including APS than in controls. Only TSH levels were significantly higher in HT group than in the control group (p < 0.02). BMI of HT patients did not differ statistically from healthy controls.

Conclusion: The results of our study did not indicate that young patients with HT, including those with APS 3 have impaired ovarian function and reserve. The authors have nothing to disclose.

Acknowledgments

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Conclusions

The results of our study did not indicate that young patients with HT, including those with APS 3 have impaired ovarian function and reserve.

References


Results

Table 1. Serums levels of AMH, Inhibit-B, FSH and estrogens in patients with HT and in controls

<table>
<thead>
<tr>
<th></th>
<th>Age (yrs)</th>
<th>AMH [ng/ml]</th>
<th>Inhibit B [ng/ml]</th>
<th>FSH [mIU/ml]</th>
<th>Estrogens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controls</td>
<td>16.9</td>
<td>2.1-9.9</td>
<td>7.1-224.7</td>
<td>9.0-27.80</td>
<td>8.3-152.9</td>
</tr>
<tr>
<td>P</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
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</tbody>
</table>

Table 2. Serums levels of SHBG, PRL, aTPO and LH in patients with HT and in controls

<table>
<thead>
<tr>
<th></th>
<th>Age (yrs)</th>
<th>SHBG [mg/dl]</th>
<th>PRL [mIU/ml]</th>
<th>aTPO [mIU/ml]</th>
<th>LH [mIU/ml]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controls</td>
<td>16.9</td>
<td>30.5-163.8</td>
<td>62-363.5</td>
<td>0.07-123</td>
<td>0.07-155</td>
</tr>
<tr>
<td>P</td>
<td>NS</td>
<td>NS</td>
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</table>

Figure 2. Serum levels of TSH and FT4 in the patients with HT and in the control group (p = 0.02).

Patient's background

In young women with HT, the AMH levels were significantly higher in HT group than in the control group (p = 0.02). BMI of HT patients did not differ statistically from healthy controls.

Furthermore, HT patients did not differ statistically from healthy controls.

Results

There were no clinical signs and symptoms regarding ovarian function between examined and control groups.

As well FSH, E2, and Inh B, as AMH levels did not differ statistically between group of patients with HT and healthy controls (Tab. 1). BMI of HT patients did not differ statistically from healthy controls.

To assess the ovarian reserve in young women with HT using the evaluation of:

• classical hormone methods (FSH, E2, Inh B)
• and a measurement of AMH

Background

Hashimoto disease and hypergonadism

• Hashimoto’s thyroiditis (HT) is likely to be associated with ovarian dysfunction and diminished ovarian reserve.
• >50% of patients with the diagnosis of chronomically competent premature ovarian failure (POF) present before the occurrence of risk factors of POOF (chemo- and radiotherapy) had an associated autoimmune disorder, the most frequently autoimmune thyroiditis [1].
• In 18.5% of patients (22/119) with POF had hypothyroidism [2].
• Isolated ovarian autoimmune disease is rare in women, but is often observed in association with other autoimmune diseases, as a result of the breakdown of at least two mechanisms that protect the ovary from autoimmune attack:
  • the control of autoreactive T cells by thymus-derived regulatory T cells,
  • a role for the autoregulator (AIRE), a transcriptional regulator that induces expression of tissue-restricted antigens in medullary thymic epithelial cells during development of T cells [3].

There are contradictory data on premature ovarian aging in HT adult patients [4, 5] and scarce data on this subject in children [6].

Assessment of ovarian reserve in girls and women

• In females with normal menstrual cycles in 3rd – 5th day of the cycle
  • FSH
  • Estrogens
  • Inhibit B
  • In girls after age of about 7 years, elevated basal gonadotropins point to gonadal damage [7].

Assessment of the number of antral follicles by ultrasonography best predicts the quantitative aspect of ovarian reserve. However, the measurement of the antral follicle should be performed using a transvaginal ultrasound during in the early follicular phase.

Anti-Mullerian hormone (AMH)

• AMH is produced in females since prenatal time, but it is levels 100-1000 lower in comparison to males.
• AMH is produced by the small growing (primary and preantral) follicles in the postnatal ovary and has two sites of action.
• It inhibits initial follicle recruitment (1) and inhibits FSH-dependent growth and selection of preantral and small antral follicles (2) [Fig. 1].

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