

IVF/ICSI efficiency in women with Hashimoto thyroiditis

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It is known that in women affected with thyroid autoimmunity, namely Hashimoto's thyroiditis, the prevalence of infertility is very high and reaches 47%. The retrospective cohort study was performed to assess the effects of thyroid autoimmunity on IVF/ICSI outcomes in women with infertility due to tubal factor and verified autoimmune thyroiditis in status of euthyroidism. The present study confirms a negative impact of thyroid autoimmunity on the course of pregnancy achieved through IVF/ICSI. Thyroid autoimmunity does not appear to have an impact on IVF/ICSI outcome in terms of mean number of oocytes retrieved. However, fertilization, implantation and delivery rates were lower, and the risk of miscarriage was higher in the presence of anti-thyroperoxidase autoantibodies. Thus, thyroid autoantibodies positivity even in euthyroid state should be considered an independent risk factor for pregnancy complications after IVF/ICSI treatment.

Keywords: TPOAbs, ART, infertility, ovarian reserve, embryo quality.

Global infertility prevalence rates among couples are difficult to determine but are generally believed to range between 10–15% and has not changed significantly despite of the evolution of assisted reproductive technologies (ART) [1]. In recent years, the relationship between reproductive failure and autoimmune conditions, including thyroid disorders, becomes particularly relevant and attracts attention worldwide.

Autoimmune thyroid disease (AITD) is the most common organ-specific autoimmune disorder affecting 2% to 5% of the population in Western countries and among women of reproductive age is found 5–10 times more often than in men [2].

Autoimmune thyroiditis (Hashimoto's thyroiditis, HT) — chronic progressive disease characterized by lymphoid infiltration of the thyroid gland including T and B cells, resulting in inflammation and leading to the gradual extinction of thyroid function with a number of complications. The condition was originally termed struma lymphomatosa, translated into English as lymphadenoid goitre, by Hakaru Hashimoto over 100 years ago, but has now acquired the character of a socially significant and globally common disease. In Russia, the frequency of AIT reaches 45 cases per 1000 population, in the USA since 1997, AIT ranks third in terms of the prevalence of autoimmune diseases. Hashimoto thyroiditis is the most frequent autoimmune condition among women of reproductive years and is characterized as presence of serum antibodies directed against a membrane-associated haemoglycopro-

tein expressed only in thyrocytes (thyroperoxidase, TPO-abs) or a glycoprotein homodimer produced predominantly by the thyroid gland (thyroglobulin, Tg-abs) [3].

It is demonstrated that in women presenting with thyroid autoimmunity, namely Hashimoto thyroiditis, the prevalence of infertility was very high and reached 47% [4].

Aim of the study

To investigate the effects of thyroid function and thyroid autoimmunity on IVF outcomes.

Materials and methods

The retrospective cohort study was performed at the Department of Assisted Reproductive Technologies, The Research Institute of Obstetrics, Gynecology, and Reproductology named after D.O. Ott. To be eligible, participants had to be between the ages of 20 years and 40 years and a body mass index (calculated as weight in kilograms divided by height in meters squared) of 35 or less. Women taking a thyroid hormone or antithyroid medication or who had undergone thyroid surgery or radioiodine treatment were excluded from the trial. Women were not eligible if they had 2 or more spontaneous miscarriages; had known diabetes mellitus or other endocrinologic, metabolic diseases or advanced stages of endometriosis.

Fifty non-pregnant women with infertility due to tubal factor and verified autoimmune thyroiditis without thyroid dysfunction (normal thyroid-stimulating hormone (TSH) level and normal thyroid hormone levels) were included in the study group. Fifty women with tubal factor infertility without any history of thyroid disorder and negative for TPOAbs served as a control group.

Routine pre-IVF evaluation at the center includes ovarian function determinations by baseline follicle stimulating hormone (FSH) on cycle days 2/3 and random anti-Müllerian hormone (AMH), TSH and thyroid autoantibody assessments for thyroid peroxidase (TPO). All hormone assessments were made by routine commercial assays. Thyroid antibody status was considered positive in the presence of one thyroid antibodies.

A standard GnRH antagonist protocol was applied in both groups. Oocyte retrieval by transvaginal needle aspiration was performed 36 hours after ovulation triggering with 10,000 IU of hCG (Pregnyl; MSD). Micronized P (Utrogestan; Besins International) was administered daily in three separate doses of 200 mg intravaginally for luteal-phase supplementation.

Analyses were conducted using IBM SPSS Statistics 25, 2017.

Results

Mean age of all investigated patients was 32.8 ± 4.5 years, mean FSH was 5.9 ± 2.0 IU/mL, mean LH was 4.1 ± 1.9 IU/mL, mean TSH was 2.42 ± 0.15 . Mean thyroid peroxidase antibody values were 209.87 ± 54.24 IU/mL among TAI-positive group. Surprisingly, higher levels of AMH were detected in the study group (2.42 ± 0.15 ng/mL) in comparison to the controls (1.75 ± 0.13 ; $p < 0.05$).

A total length of stimulation, gonadotropin doses and number of oocytes retrieved were comparable between the groups.

TAI-positive women had a significantly lower fertilization rate (63.3 % vs. 75.6 %, $p < 0.001$), implantation rate (15.8 % vs. 25.1 %, $p < 0.001$) and a higher risk of abortion (28.9 % vs. 10.8 %, $p < 0.002$) after IVF treatment compared with the women from the control group. Delivery rate was higher among TAI-negative group when compared to the study group (62 % vs. 53 %, $p < 0.05$).

Conclusions

The present study confirms a negative impact of TAI on the course of pregnancy achieved through IVF/ICSI. TAI does not appear to have an impact on IVF/ICSI outcome in terms of mean number of oocytes retrieved. However, fertilization, implantation and delivery rates are lower and the risk of miscarriage is higher in the presence of TPOAbs.

Thus, thyroid antibody positivity should be considered an independent risk factor for pregnancy complications after IVF/ICSI treatment.

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