




Macro-TSH — tips and tricks for gynecologists

Dagmara Pluta¹, Agnieszka Bedkowska-Szczepanska², Pawel Madej¹,
 Barbara Zubelewicz-Szkodzinska²

¹Department of Endocrinological Gynecology, Medical University of Silesia, Poland

²Department of Endocrinology, Medical Center in Piekary Slaskie, Poland

ABSTRACT

Thyroid disorders are one of the most common endocrinopathies in women of reproductive age.

Measurement of TSH (thyroid-stimulating hormone) concentration in women planning pregnancy/pregnant is a golden standard of thyroid function assessment. When the laboratory findings do not correspond with the clinical signs, it is reasonable to mark macro-TSH.

Key words: macro-TSH; pregnancy; thyroid dysfunction

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CASE STUDY

Thyroid function disorders are among the most common diseases, and subclinical hypothyroidism affects up to 10% of the adult population [1].

There is evidence that thyroid dysfunction could be one of the reasons for female infertility, as well as obstetric complications [2]. That is the reason why thyroid function should be assessed by TSH concentration in every woman planning pregnancy.

According to the recommendations of the Polish Endocrine Society and American Thyroid Association, TSH concentration should be routinely determined, especially in the first trimester of pregnancy. This should also be the case in women planning pregnancy and in patients undergoing treatment for subfertility with a cut-off point of 2.5 mIU/L [2, 3].

A 27-year-old female after thyroidectomy (due to nodular goiter) in spite of constant levothyroxine supplementation was referred with persistently elevated TSH (> 100 mIU/L) measured by the of method Chemiluminescent Microparticle Immunoassay (Abbott, USA). The patient's complaints were unspecific and she appeared clinically euthyroid. The plasma levels of free thyroxine (T4) and free triiodothyronine (T3) were within the normal range, thyroid autoantibodies were negative, and thyroid ultrasonography did not present any known abnormalities. The gastro-intestinal examination had been previously carried out to eliminate any gastric reason of malabsorption.

In the diagnosis, we initially checked the levothyroxine absorption by measuring the free T4 concentration after a morning dose of 200 µg of levothyroxine which was followed by increasing fT4 levels. Then, we decided to check the sample for possible macro-TSH presence. As we hadn't the possibility of gel-filtration chromatography (GFC), which is the state-of-art method for detection of macro TSH, we checked TSH concentration after polyethylene glycol (PEG). The results are presented in Table 1.

DISCUSSION

Measurement of TSH concentration in women planning pregnancy/pregnant is a golden standard of thyroid function assessment. To prepare the patient for pregnancy we must be sure about the function of this gland. When the laboratory

Corresponding author:

Dagmara Pluta
 Medical University of Silesia, Medykow St, 44-752 Katowice, Poland
 e-mail: dpluta@sum.edu.pl

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Table 1. Hormonal and antibodies data during hospitalization

Reference values for the laboratory	2 July 2021 at 8 am	2 July 2021 at 9 am	5 July 2021
TSH — 0.35–4.94 (mIU/L)	> 100		
ft4 — 0.7–1.48 (ng/dL)	0.81	0.90	
ft3 — 1.7–3.7 (pg/mL)	1.72	2.19	
T4 — 4.87–11.72 (µg/dL)	6.03	8.02	
T3 — 0.58–1–59 (ng/mL)	0.63	0.73	
A-TPO — 0–5.61 (IU/mL)	< 0.3		
A-TG — 0–4.11 (IU/mL)	0.61		
post-PEG TSH recovery (%)			10.7

A-TG — thyroglobulin antibodies; A-TPO — thyroid peroxidase antibodies; PEG — polyethylene glycol

findings (TSH elevated, free hormones in normal) do not correspond with the clinical signs and we are sure about the patient's compliance we must keep in mind possible macro-TSH presence.

As there is, unfortunately, no specific immunoassays which can reveal the presence of macro-TSH, we can adopt measurement of TSH after addition of PEG — as it is used in the diagnosis of macroprolactinoma [4]. This method is based on either the post-PEG recovery level of monomeric prolactin or the use of post-PEG monomeric prolactin reference intervals. Dilution studies might be helpful in identifying assay interference. In literature, the percentage of recovery calculation less than 20 or 25% is used [5]. Considering lower costs and higher accessibility than with GFC, such an approach may be a valid alternative for detection of macro-TSH [5].

Every gynecologist should be aware of its possible presence if considering patient planning pregnancy, undergoing levothyroxine treatment with good compliance and elevated TSH level.

Conflict of interest

All authors declare no conflict of interest.

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