

Impact of maternal hypothyroidism for early and late pregnancy complications woman treated by assisted reproductive technologies

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Abstract

Pregnancy is an important stage every woman's life. Unfortunately, sometimes the possibility of getting pregnant can be hindered as a result of many diseases. One of them is hypothyroidism, which affects 4 to 10% of society, which is why it is an important topic that should be known to every woman planning pregnancy. The aim of our study was to examine the knowledge of women in the reproductive period on hypothyroidism and early and late pregnancy complications. The study was conducted by online questionnaire among 375 women of childbearing age and patients with hypothyroidism, of which the predominant number of 312 women were ill. The research shows that there is a relationship between the diagnosis of hypothyroidism and pregnancy, the number of children, problems with getting pregnant and treatment of infertility. In addition, women with hypothyroidism were more likely to have no children. Women with known hypothyroidism were more likely to have problems getting pregnant. Infertility treatment was more often observed in women who were ill with hypothyroidism. Hypothyroidism is a medical problem that is important from the point of view of the obstetrician and gynecologist, which is why it is very important to make women planning pregnancy more aware of it.

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Introduction

Pregnancy is an important stage every woman's life. The desire of having children results from the natural need of motherhood. Occasionally, the possibility of getting pregnant can be difficult as a result of many diseases, including thyroid diseases. Hypothyroidism is one of the most common endocrine diseases and affects 4 to 10% of the population, of which about 3% of cases are overt hypothyroidism, while the rest of cases are subclinical. Experts estimate that thyroid problems affect about 300 million people in the world and half of do not know about it. In Poland, the problem concerns 22% of people. Despite its small size, the thyroid plays a huge role in controlling the majority of systems in the body, starting from the regulation of metabolism, ending with the control of the reproductive system. Hypothyroidism affects people in every age group, causing a number of unwanted symptoms and complaints.

Hypothyroidism is the cause of difficulty in getting pregnant, and also involves the risk of many complications during its duration on both the mother and the child's side. That is why knowledge about the disease in the case of women of childbearing age is particularly important [1]. Currently scientists think that only severe dysfunction of the thyroid gland contributes to the difficulties in getting pregnant, among others by suppressing ovulation or a number of menstrual disorders. Therefore, although hypothyroidism can significantly impede pregnancy, it does not completely exclude it [2]. During pregnancy the need for thyroid hormones and iodine increases. Since the conception in the woman's body many physiological changes have been taking place, affecting hormonal tests, such as increase TBG globulin, hcG increase, increase in glomerular filtration, and thus increase in iodine excretion in urine [3].

During pregnancy due to the action of estrogens, the concentration of globulin increases twice. Increased concentration of TBG protein is associated with an increase in thyroid hormone production by about 50%. Hypothyroidism is revealed often during, which is why according to the Polish Society of

Endocrinology, Tsh should be routinely performed in women in the preconception period. Both overt (full-blown) and sub-clinical hypothyroidism (SCH) is a special health problem in the pregnant population. It is estimated that clinically overt hypothyroidism affects 0.5 percent of pregnant women. A slightly larger percentage relates to the subclinical form, ranging from 2-4 percent of cases. Both forms are an absolute indication for treatment with levothyroxine. Clinically overt hypothyroidism gives symptoms that can be considered physiological in pregnant women, among others fatigue, constipation and weight gain, that is why it is important to mark TSH already in the first trimester of pregnancy [4, 5, 6]. The awareness of women of childbearing age on the subject of hypothyroidism is very important due to complications in the course of pregnancy.

Aim

The aim of our study was to examine the knowledge of women in the reproductive period on hypothyroidism and early and late pregnancy complications.

Methods

The study of the impact of hypothyroidism on the possibility of pregnancy was carried out with the help of a research tool - an online survey among 375 women of childbearing age and patients with hypothyroidism, of which the number of 312 women were ill. The questionnaire consists of one-time and multiple-choice questions. The obtained results were analyzed using the Statistica program on an academic license. Before entering the survey, women were informed about the anonymity of the study. Each of the fillers was informed that the obtained data will be used only for scientific purposes. The research started in February 2018, finished in July of the same year. The interest in the conducted research was very large, and the sick women were very likely to take part in completing the questionnaire.

Results

Statistical analysis do not show statistically significant differences between the studied groups. (Chi^2 : 18,586 $p=0,291$) (Tab. 1).

According to the statistical analysis, no differences were noticed between hypothyroidism and the

time of applying for a child. (Chi^2 : 3,144 $p=0,925$) (Tab. 2).

Statistical analysis do not show the relationship between hypothyroidism and the occurrence of complications in a child after delivery. (Chi^2 : 0,617 $p=0,892$) (Tab. 3).

Table 1.

Hypothyroidism and complications during pregnancy

Pregnancy complications	Hypothyroidism		all
	no	yes	
Anemia	5 19,2%	21 80,8%	26 100,0%
Anemia, preeclampsia	1 100,0%	0 0,0%	1 100,0%
Miscarriage in first trimester	7 11,7%	53 88,3%	60 100,0%
Miscarriage in first trimester, anemia	0 0,0%	3 100,0%	3 100,0%
Miscarriage in first trimester, anemia, preeclampsia	0 0,0%	2 100,0%	2 100,0%
Miscarriage in first trimester, Preterm delivery	3 42,9%	4 57,1%	7 100,0%
Miscarriage in first trimester, Preterm delivery, anemia	0 0,0%	1 100,0%	1 100,0%
Miscarriage in first trimester, Preterm delivery, preeclampsia	0 0,0%	1 100,0%	1 100,0%
Miscarriage in first trimester, preeclampsia	0 0,0%	3 100,0%	3 100,0%
Miscarriage In second trimester	2 66,7%	1 33,3%	3 100,0%
Miscarriage In secondo trimester, anemia	0 0,0%	1 100,0%	1 100,0%
Preterm delivery	5 26,3%	14 73,7%	19 100,0%
Preterm delivery, anemia	0 0,0%	1 100,0%	1 100,0%
Preterm delivery, anemia, preeclampsia	0 0,0%	3 100,0%	3 100,0%
Preterm delivery, preeclampsia	0 0,0%	3 100,0%	3 100,0%
Preeclampsia	1 16,7%	5 83,3%	6 100,0%
None of the above	37 22,3%	129 77,7%	166 100,0%
All	61 19,9%	245 80,1%	306 100,0%

Chi^2 : 18,586 $p=0,291$ $p>0,05$

Table 2.
Hypothyroidism and the time to apply for pregnancy.

Time to apply for pregnancy	Hypothyroidism		All
	no	yes	
1 year	1	17	18
	5,6%	94,4%	100,0%
10 years	0	3	3
	0,0%	100,0%	100,0%
2 years	0	28	28
	0,0%	100,0%	100,0%
3 years	0	2	2
	0,0%	100,0%	100,0%
4 years	0	3	3
	0,0%	100,0%	100,0%
5 years	0	2	2
	0,0%	100,0%	100,0%
6 years	0	1	1
	0,0%	100,0%	100,0%
6 months	1	10	11
	9,1%	90,9%	100,0%
9 years	0	1	1
	0,0%	100,0%	100,0%
All	2	67	69
	2,9%	97,1%	100,0%

Chi²: 3,144 p=0,925 p>0,05

Discussion

Pregnancy is a physiological state in a woman's life, and having children is often the main goal of people of childbearing age. For this reason, diseases that complicate the period of pregnancy, both causing sterility and infertility must be taken very seriously. The problem of hypothyroidism during pregnancy is the subject of many studies, and new reports on this subject flow from around the world. In the Lancet magazine in 2013 Teng W. et al published an article, which shows that the topic should still be examined because hypothyroidism is one of the most common comorbidities in pregnancy and is the most common thyroid disease in pregnancy. At the same time confirmed the information that the using levothyroxine is the basic and sufficient therapy in pregnant women [7,8]. The influence of hormonal disorders on pregnancy has been quite well understood. The effect of hypothyroidism is related to

Table 3.
Hypothyroidism and child's complications

After delivery child's complications	Hypothyroidism		All
	no	yes	
Low birth weight	8	26	34
	23,5%	76,5%	100,0%
Low birth weight, mental retardation	0	1	1
	0,0%	100,0%	100,0%
Congenital hypothyroidism, mental retardation	0	1	1
	0,0%	100,0%	100,0%
None of the above	45	162	207
	21,7%	78,3%	100,0%
All	53	190	243
	21,8%	78,2%	100,0%

Chi²: 0,617 p=0,892 p>0,05

menstrual disorders, ovulation and causes a drop in sex hormones. Hypothyroidism in the course of Hashimoto's disease may end in the most serious complication which is miscarriage. [9,10,11] It may be rewarding that the treatment with levothyroxine significantly reduces the risk of pregnancy complications in both hypothyroidism and subclinical hypothyroidism. At the same time, the authors note that the vast majority of women suffering from hypothyroidism are treated with levothyroxine, thanks to which it is possible to avoid complications [12]. However, there are various studies in women treated with assisted reproduction techniques and it is not completely clear up. [13,14]

Assisted reproduction treatment techniques may disturb the thyroid hormone balance. Patients treated with the long GnRH protocol may develop subclinical hypothyroidism [15]. A long, 20-year study by Gutvitz et al. It confirmed that children of mothers affected by hypothyroidism are at risk of

distant neurological disorders [16]. A similar study confirmed the threat of long-term hormonal disorders [17]. A more frequent occurrence of respiratory disorders than in newborns of healthy mothers was observed in the newborns of mothers with hypothyroidism. Untreated hypothyroidism in pregnant mother is associated in children with worse psychomotor development [18]. Research carried out by Abolovich and co-authors indicate that inadequately treated hypothyroidism in pregnant women was the cause of pregnancy loss before week 22 in 60% of respondents, preterm delivery included 20% of sick women. Taking care should ensure the continuity and quality of therapy, so that the pregnancy proceeds without problems and unnecessary risk of gestational hypertension, eclampsia, premature detachment of the placenta or miscarriage [19,20].

Conclusions

1. There is a relationship between the diagnosis of hypothyroidism and the course of pregnancy, the number of children, problems with getting pregnant and treatment of infertility.

2. Women with hypothyroidism were more likely to have no children.

3. Women with hypothyroidism were more likely to have problems getting pregnant.

4. Treatment of infertility was more often observed in woman with hypothyroidism.

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