



Age, place of living and education influences the pregnancy universal thyroid function screening program attendance — questionnaire study

Wiek, miejsce zamieszkania i wykształcenie wpływają na zgłaszalność ciężarnych do badań przesiewowych funkcji tarczycy — badanie ankietowe

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Abstract

Background: The aim of this study was to assess attendance at the universal screening programme for thyroid function in pregnancy and attempt to evaluate the influence of age, number of past pregnancies, level of education, and place of residence on the attendance. The study was performed by means of a questionnaire.

Material and methods: Our study was performed on the basis of an anonymous questionnaire handed out to 543 women aged 16–45 years, on the third day of their puerperal stay in one of five obstetric wards in southern Poland. The questionnaire contained questions about participation in plasma level measurements of TSH, fT4, total T4, thyroid antibodies or thyroid ultrasound scanning at least once in pregnancy.

Results: The rate of attendance at any examination of thyroid function among pregnant women was 26.7%. The highest attendance rate (32.7%) was found among women living in provincial capitals or with higher education (41.3%), whereas the lowest was among women who had completed only primary school (11%) and those living in county towns (15%). The number of previous pregnancies did not influence the thyroid screening attendance. Women over 21 years of age participated in this screening programme more frequently (27.1–30%).

Conclusion: Less than one third of pregnant women participated in the thyroid function screening. Place of living, education level, and age were the main factors influencing the attendance rate. (*Pol J Endocrinol* 2011; 62 (5): 416–420)

Key words: TSH, pregnancy, screening test

Streszczenie

Wstęp: Celem pracy było oszacowanie metodą ankietową odsetka ciężarnych, które wykonały w ciąży badania umożliwiające wykrycie zaburzeń funkcji tarczycy oraz próba oceny wpływu takich czynników, jak wiek, liczba ciąż, wykształcenie i miejsce zamieszkania na zgłaszalność do tych badań.

Materiał i metody: Analizę przeprowadzono na podstawie anonimowych badań ankietowych, które przeprowadzono u 543 kobiet w wieku 16–45 lat, w 3. dniu połogu w 5 oddziałach położniczych na terenie województwa małopolskiego i podkarpackiego. Pytania ankiety dotyczyły wykonania oznaczenia TSH, fT4, T4 całkowitej, przeciwciał przeciw tarczycowym oraz USG tarczycy przynajmniej 1 raz w ciąży.

Wyniki: Spośród ankietowanych 26,7% ciężarnych wykonało jakiekolwiek badanie oceniające funkcję tarczycy w ciąży. Najwięcej ciężarnych, które wykonały takie badanie, zamieszkiwało w mieście wojewódzkim (32,7%), a najmniej w mieście powiatowym (15%). Grupa ciężarnych z wykształceniem wyższym najczęściej (41,3%), a z wykształceniem podstawowym najrzadziej (11%) wykonywała takie badania. Nie stwierdzono istotnych statystycznie różnic w częstości wykonywania badania funkcji tarczycy pomiędzy grupami ciężarnych z innymi rodzajami wykształcenia. Częstość wykonywania tego badania nie różniła się pomiędzy grupą kobiet będących po raz pierwszy w ciąży a kobietami, które co najmniej raz urodziły. Częściej badanie funkcji tarczycy wykonywały pacjentki w wieku powyżej 21 lat (26,3–30%).

Wniosek: Mniej niż 1/3 ciężarnych wykonała badanie przesiewowe funkcji tarczycy. Wiek, miejsce zamieszkania i wykształcenie wpływały na zgłaszalność do badań przesiewowych funkcji tarczycy. (*Endokrynol Pol* 2011; 62 (5): 416–420)

Słowa kluczowe: TSH, ciąża, badania przesiewowe



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Introduction

Thyroid gland disorders commonly affect women of reproductive age [1]. Pathological processes involving the thyroid gland develop mainly as a result of inadequate iodine supplementation or autoimmune diseases. Autoimmune diseases of the thyroid gland are 5- to 10-fold more frequent in women of reproductive age than in men [1]. These diseases attack 4% of women of reproductive age and 15% of them express antithyroid autoantibodies in blood [1]. Autoimmune thyroid diseases increase the risk of spontaneous miscarriage by up to four times [2]. Early miscarriages were observed in half of the women with positive antithyroid antibodies [3, 4]. Research over the last decade has produced a significant body of evidence demonstrating changes in thyroid hormones blood levels in uncomplicated pregnancy. In the first trimester, the free fraction of serum thyroid hormones increases, whereas the TSH level is reduced [5]. While the pregnancy is progressing, the serum concentrations of thyroid hormones decline and the level of TSH grows [6–8]. Furthermore, in the third trimester of pregnancy, the expression of thyroid hormones receptors is decreased [9].

An increased level of TSH can be observed in about 2.5% of pregnant women. According to some authors [10, 11], 1.5–2% of pregnant women are affected by clinically evident hypothyroidism. Untreated hyperthyroidism in pregnancy is associated with a doubled or even tripled risk of several complications: pregnancy-induced hypertension, abruption of the placenta, preterm delivery, puerperal haemorrhage, or intrauterine death [10, 11]. This risk correlates with elevated TSH concentration rather than with low level of thyroid hormones or an autoimmune thyroid disease [12, 13].

Hyperthyroidism occurs in 0.1–0.4% of pregnancies and Graves' disease accounts for 85% of the cases. Untreated hyperthyroidism in pregnancy bears the risk of preeclampsia, preterm delivery, foetal hypotrophy, or even intrauterine death [14].

The aim of this study was to evaluate the proportion of pregnant women who were screened for possible thyroid dysfunction. Moreover, we tried to assess how the age, number of past pregnancies, level of education, and place of residence affected the rate of response to the screening programme. The research method applied was a survey questionnaire.

Material and methods

The analysis was based on data collected through an anonymous survey of 543 women aged 16 to 45 years, on their third day of puerperium, in five obstetric wards in the Małopolska and Podkarpacie provinces of Poland

(Kraków, Krosno, Mysłowice, Chrzanów, Sucha Beskidzka). The questionnaire included 18 questions regarding basic information about the respondents and multiple choice questions related to the topic (see: questionnaire). The questionnaires, to be filled in individually and independently by each respondent, were distributed and collected by midwives employed in these hospitals. The midwives could explain the questions that were unclear, but did not participate in the survey. The completed questionnaires were collected and returned to the researchers for analysis. The respondents were divided into four groups according to their age. The first group comprised women aged under 21 years (11.8%); 48.3% of respondents were aged between 22 and 29; 31.7% of them 30–37; and 8.2% — 38–45 years. The women were divided into groups by their (self-declared) level of education: university degree or equivalent 31.6%, post secondary vocational 10.9%, high school 37.6%, lower vocational 11.4%, and primary school 8.5%. Concerning the place of living, the respondents were divided into the following groups: 32.1% lived in the provincial capital, 20.8% in a county town, 18.2% in a municipal town, while 28.9% were in a rural area. According to the number of previous pregnancies, the women were divided into primigravidae (49.7%) and multiparae (50.3%). The results were analysed statistically with the use of non-parametric tests. P values less than 0.05 were considered as significant.

Results

Thyroid function was evaluated in 145 pregnant women, which constitutes 26.7% of the population intended to be included in this study (Table I). Most of these women lived in the provincial capital (Table II) or completed higher education. We did not observe any statistically significant differences in the proportion of women screened for thyroid function between the remaining educational groups (Table III). There was no difference between women pregnant for the first time and those with previous pregnancies (Table IV). Women over the age of 21 years attended thyroid screening more frequently (Table V).

Discussion

The recommendations of the Polish Gynaecological Society, published in 2005, for the management of uncomplicated pregnancy do not address evaluation of the thyroid gland function [15]. Published in 2007, international recommendations also do not advocate screening for TSH serum concentration in pregnant women [16]. However, Negro et al. found that in 115 subjects out of 984 pregnant euthyroid women, thyroid peroxidase antibodies were present [17]. Half of the total of anti-TPO

Table I. Number of pregnant patients who attended the thyroid function screening tests**Tabela I.** Liczba kobiet, które zgłosiły się do badania przesiewowego funkcji tarczycy

	Tested		Not-tested	
	Number of women	%	Number of women	%
Thyroid function screening tests in pregnancy	145	26.7	398	73.3

Table II. Place of residence of pregnant patients who attended the thyroid function screening tests**Tabela II.** Miejsce zamieszkania kobiet a zgłaszalność do przesiewowych badań funkcji tarczycy

	Attendance								P
	A		B		C		D		
Place of residence	Provincial capital		County town		Municipal town		Rural area		
Total number of women	n = 174		n = 113		n = 99		n = 157		
	%	Number of women	%	Number of women	%	Number of women	%	Number of women	
Thyroid function screening tests in pregnancy	32.7	55	15	17	26.3	28	25	43	< 0.05; A/C; A/D; C/D NS

Table III. Level of education of pregnant patients who attended the thyroid function screening tests**Tabela III.** Wykształcenie kobiet ciężarnych a zgłaszalność do przesiewowych badań funkcji tarczycy

	Attendance										P
	A		B		C		D		E		
Total number of women	n = 172		n = 59		n = 204		n = 62		n = 46		
Level of education	University degree or equivalent		Post secondary vocational		High school		Lower vocational		Primary school		
	%	Number	%	Number	%	Number	%	Number	%	Number	
Thyroid function screening tests in pregnancy	41.3	69	25.4	13	23.5	46	16	10	11	5	< 0.05; B/C; B/D; B/E; C/D; C/E; D/E NS

Table IV. Parity of pregnant patients who attended the thyroid function screening tests**Tabela IV.** Dzietność kobiet ciężarnych zgłaszających się do badań przesiewowych funkcji tarczycy

Group of women	Attendance				P
	Primigravidae (n = 270)		Multiparae (n = 273)		
	W%	Number	W%	Number	
Thyroid function screening tests in pregnancy	26.3	71	26.4	72	NS

positive women were supplemented with levothyroxine and in this group miscarriages or premature births were less frequent than in the untreated controls [17]. In 2010, Negro et al. performed an analysis of obstetric outcomes and found no advantage in universal screening com-

pared to case finding only in women with a family history of thyroid disease risk factors [18]. Also in 2010, the same authors observed an increased incidence of pregnancy loss in women with blood TSH levels over 2.5 mIU/L [19]. Horacek et al. studied a population of 400 pregnant

Table V. Age of pregnant patients who attended the thyroid function screening tests

Tabela V. Wiek kobiet ciężarnych zgłaszających się do przesiewowych badań funkcji tarczycy w ciąży

	Attendance								P
	A		B		C		D		
	%	Number	%	Number	%	Number	%	Number	
Age range (years)	19–21		22–29		30–37		38–45		
	n = 64		n = 262		n = 172		n = 45		
Thyroid function screening tests in pregnancy	15.6	11	27.3	71	30	51	27.1	12	NS; A/C < 0.05

Czech women, who were similar to Polish subjects and demonstrated the presence of thyroid disorders in 16.3% of cases by means of biochemical tests. They also found that examination of the thyroid function only in women with suspected thyroid disease on the basis of personal and/or family history or previous miscarriages was the cause of omission of about 50% of cases that required specialist treatment [20]. Vaidya et al. performed an analogous analysis using criteria similar to those of Horacek et al. and found that an analysis of patient history, without universal screening, could result in the omission of about 30% of cases of thyroid disorders that required therapy [21]. Thung et al. assessed the costs of routine screening for thyroid function in pregnancy and showed that the costs of tests and treatment are lower than those of treatment of neuropsychological impairment in offspring of untreated mothers with undiagnosed thyroid conditions [22]. Glinoeer and Spencer stated that there is an urgent need for universal screening for serum TSH in pregnancy [23].

In our survey, less than one third of pregnant women from the Małopolska province were tested one way or another for their thyroid function. Factors influencing the frequency of attendance were age, place of living, and level of education. The same factors determined the frequency of attendance for the screening test for glucose metabolism [24].

Taking into account the geographical location of this region of Poland, it would be advantageous to screen pregnant women for serum TSH level on a routine basis.

Conclusion

Less than one third of women were tested for thyroid function. The frequency of attendance was mainly influenced by age, place of living, and level of education.

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QUESTIONNAIRE

The following questionnaire is anonymous and intended for research purposes only.

1. What is your age?
-
2. What is your place of residence?
- Provincial capital
 - County town
 - Municipal town
 - Rural area
-
3. What is your level of education?
- Primary school
 - High school
 - Secondary vocational
 - Bachelor's degree
 - Master's degree
 - Post secondary vocational
 - Lower vocational
-
4. Do you have any chronic diseases?
- Diabetes
 - Hypertension
 - Hypo- or hyperthyroidism (please underline)
 - Other thyroid disorders (please specify).....
 - Other diseases (please specify)
-
5. Is the last pregnancy your:
- First
 - Subsequent (please specify which one).....
-
6. The previous pregnancy ended in:
- Miscarriage
 - Preterm delivery
 - Timely delivery (37–40 week)
 - Postterm delivery
-
7. The previous uncomplicated pregnancies ended in:
- Vaginal birth
 - Caesarean section
- Example:** 1st pregnancy, vaginal delivery
2nd pregnancy, caesarean section
-
8. Children born previously:
- Are healthy
 - Were born with a congenital abnormality
 - Are suffering from cerebral palsy secondary to perinatal complications
 - Had other problems (please describe).....
-
9. Did your last pregnancy progress normally?
- Yes
 - No
-
10. If NOT, please specify what happened (please tick all symptoms you had and specify when did they start appearing)
- Vaginal bleeding
 - Premature uterine contractions
 - Premature rupture of membranes
 - Oedemas
 - Elevated blood pressure
 - Proteinuria
 - Vomiting
 - Anaemia
 - Others — please specify.....
-
11. How much weight did you gain during your last pregnancy?
- Less than 10 kg
 - 10–15 kg
 - More than 15 kg
-
12. In which week of the last pregnancy was your child born?
-
-
13. The last pregnancy ended in:
- Vaginal birth
 - Caesarean section
-
14. Your youngest child:
- Is healthy
 - Was born with a congenital abnormality
 - Was born with cerebral palsy
 - Has other problems (please describe).....
-
15. What were your youngest child's Apgar scores and birth weight?
- Apgar scores.....
- Birth weight
-
16. Have you had any thyroid function tests in the last pregnancy (by taking your blood sample and determination of thyroid hormones: TSH, fT₄, fT₃)?
- Yes
 - No
-
17. Have you had any thyroid tests in the last pregnancy (by taking your blood sample and determination of antithyroid antibodies: anti-TPO, anti-TG)?
- Yes
 - No
-
18. Have you had thyroid sonography examinations in the last pregnancy (a hand-held probe of the sonographic scanner is placed directly on the neck for a few minutes and the patient is given a printed description of the result)?
- Yes
 - No
-