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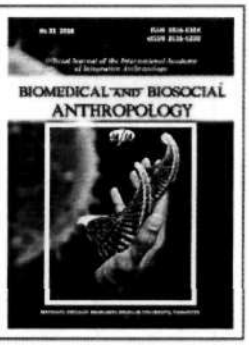

Modeling the possibility of occurrence of overactive bladder in women of different ages, depending on anthropo-somatotypological indicators or hormonal background with the help of discriminant analysis

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One of the most important problems of modern urogynecology is the improvement of the treatment-diagnostic algorithm and prevention of overactive bladder syndrome (OAB). The purpose of the work is to construct and analyze discriminant models of the possibility of OAB occurrence in pregnant women of different age groups depending on the characteristics of anthropo-somatotypological indicators or hormonal background. 75 pregnant women with clinical signs of OAB syndrome and 60 healthy pregnant women had hormonal screening in the 1st and 3rd trimester of pregnancy and at 16 weeks postpartum using radioimmunoassay and immune enzyme methods (estradiol, progesterone, thyroid stimulating hormone and testosterone levels were determined). The anthropometry was carried out according to the method of V. V. Bunak, the components of the somatotype were determined according to the method of J. Carter and B. Heath, as well as the components of the body composition according to the method of J. Matiegka and the American Institute of Nutrition (AIN). By age, all pregnant women were divided into 3 subgroups: I - from 17 to 25 years, II - from 26 to 35 years, III - from 36 to 41 years. A discriminant analysis of the possibility of OAB occurrence, depending on the anthropo-somatotypological or hormonal indices in women of different age groups, was conducted using the licensing program "Statistica 5.5". When taken into account anthropo-somatotypological indices in women aged from 17 to 25 years, the model is correct in 86.7% of cases; in women aged from 26 to 35 years - in 90.9% of cases; in women between the ages of 36 and 41 years - in 89.3% of cases. Between healthy and OAB patients, women aged from 17 to 25 years discriminating variables are the width of the distal epiphysis of the shoulder (which has the greatest contribution to discrimination), conjugata externa, the muscle component of the body weight by AIN and the forearm's girth in the upper third; women from 26 to 35 years - dist. Intertrochanterica, the width of the distal epiphyses of the forearm (the greatest contribution to discrimination), hip circumference, conjugata externa, mesomorphic component of the somatotype according to by Heath-Carter, fat mass component of the body by Matiegka, the forearm's girth in the upper third and the shoulder girth; women of age from 36 to 41 years - the width of the distal epiphysis of the leg (which has the greatest contribution to discrimination) and the length of the body. In general, the aggregate of all variables has a low level of discrimination between healthy and sick with OAB women between the ages of 17 and 25 (Wilkes Lambda statistics = 0.531; F = 5.521; p <0.01) and 36-41 years (Wilkes Lambda statistics = 0.445; F = 15.62; p <0.001), while among women between the ages of 26 and 35 - the average level of discrimination (Wilkes Lambda statistics = 0.386; F = 13.52; p <0.001). When taken into account characteristics of the hormonal background in women of all ages, the model is correct in 100% of cases. Between healthy and OAB patients, of 17-25 years age, discriminant variables are estradiol levels at 16 weeks of postpartum (with the largest contribution to discrimination) and prolactin levels in the first trimester of pregnancy; women aged from 26 to 35 years - estradiol levels at 16 weeks of postpartum

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(the most contributing to discrimination), testosterone in the third trimester of pregnancy, estradiol in the third trimester of pregnancy, prolactin in the third trimester of pregnancy, estradiol in the first trimester of pregnancy, and testosterone levels in the first trimester of pregnancy; women aged from 36 to 41 years - estradiol in the third trimester of pregnancy (has the largest contribution to discrimination) and estradiol in the 16 weeks of postpartum period. In general, the totality of all variables has a low level of discrimination between healthy and sick at OAB women between the ages of 17 and 25 (Wilkes Lambda statistics = 0.619; F = 131.4; p <0.001) and ages 26-35 (Wilks Lambda statistics = 0.493; F = 224.9; p <0.001), while among women between the ages of 36 and 41 - the average level of discrimination (Wilkes Lambda statistics = 0.371; F = 207.4; p <0.001). Thus, with the aid of discriminant analysis, reliable models of the possibility of OAB occurrence, based on anthropo-somatotypological or hormonal indices in women of different age groups, are constructed. In all age groups, the greatest contribution to discrimination between healthy and sick with OAB pregnant women, in most cases, make parameters of the width of distal epiphyses of long limb bones or the level of estradiol.

Keywords: *discriminatory analysis, pregnant women, overactive bladder syndrome, anthropometry, hormones, age*

Introduction

One of the components of functional disorders of urination and the most important problems of modern urogynecology is overactive bladder syndrome (OAB) [8, 17, 21]. Being among the dozens of the most common diseases, OAB over the frequency ahead of diseases such as diabetes mellitus, stomach ulcer and duodenal ulcer [2, 5]. In the analysis of literature data on the impact of specific pathological conditions and diseases on social activity and self-esteem, disorders of urination and, in particular, OAB, worsen the quality of life of patients more than arterial hypertension, atherosclerosis and diabetes [7], having a comprehensive impact on the labor, social and sexual life and health of patients [1, 29]. The prevalence among the population, the severity of the course and the socially-disadaptive nature of functional disorders on the part of the urinary tract determine the relevance of further studies of OAB in order to improve its diagnostic and therapeutic algorithm, since every fourth woman in the world after 30 years marks the symptoms of incontinence, including in Ukraine [10, 16].

Most authors consider pregnancy and childbirth to be the leading risk factors that contribute to the development of symptoms of urination [13, 18, 23-25, 28]. Statistically significant risk factors are the age of a woman, the number and quality of previous births, the weight of the newborn, as well as the body mass index [15, 19, 22, 27].

Insufficient effectiveness of methods of conservative treatment of urination disorders in pregnant women and the impossibility of operative correction of urinary incontinence for women after childbirth and contraindications to the use of any medical treatment during pregnancy, make it particularly relevant to improve the early prevention of OAB in pregnant women.

The *purpose* of the work is to construct and analyze discriminant models of the possibility of OAB occurrence in pregnant women of different age groups depending on the characteristics of anthropo-somatotypological indicators or hormonal background.

Materials and methods

75 pregnant women with clinical signs of OAB syndrome were selected at the bases of the Vinnitsa Clinical Maternity Hospital No. 1 and the Municipal Hospital "Mother and Child Center" for the period 2015-2017. The control group consisted of 60 practically healthy pregnant women who were registered in pregnancy in the women's consultation of these medical institutions. The criteria for inclusion in the group with OAB were: fertile age; pregnancy and lactation; presence of symptoms OAB - urinary frequency (more than 8 times a day), urgent demands (more than 3 per day), nycturia (more than 1 time per night) for more than 3 months; the presence in the patient of urgent urges for urination with or without urinary incontinence (grade 3 or 4) within 3 days according to the diary of the urinary tract; volume of residual urine more than 30 ml. All patients were consulted by a neurologist and gastroenterologist to exclude patients with a profile somatic pathology that could cause the OAB symptom complex.

Bioethics Committee of National Pirogov Memorial Medical University, Vinnytsya (protocol from 16.11.2016) found that the research conducted corresponded to the ethical and moral-legal requirements of the Order of the Ministry of Health of Ukraine No. 281 of November 1, 2000.

By age, all pregnant women were divided into 3 subgroups: I - from 17 to 25 years, II - from 26 to 35 years, III - from 36 to 41 years.

Laboratory examination of pregnant women included hormonal screening in the 1st and 3rd trimesters of pregnancy and at 16 weeks of postpartum using radioimmunological and enzyme immunoassay methods. Blood levels were determined for estradiol, progesterone, thyroid stimulating hormone and testosterone.

Anthropometry was carried out according to the method of V. V. Bunak [3]. The components of the somatotype were determined according to the method of J. Carter and B. Heath [6], and the components of the body mass composition by the methods of J.Matiegka [12] and the

American Institute of Nutrition (AIN) [20].

A discriminant analysis of the possibility of OAB occurrence, depending on the anthropo-somatotypological or hormonal indices in women of different age groups, was conducted using Statistics program 5.5 of Statsoft Company (license number AXXR910A374605FA).

Results

When taken into account *anthropo-somatotypological indicators*, the discriminatory function covers 55.6% of patients with OAB and 100% healthy women *between the ages of 17 and 25 years*. In general, the model is correct in 86.7% of cases. Between healthy and OAB patients women in the ages of 17-25, the discriminating variables are the width of the distal shoulder epiphysis, conjugata externa, the muscle component of the body weight by AIN and the forearm's girth in the upper third. The greatest contribution to discrimination between healthy and sick OAB women aged from 17 to 25 years make the size of the width of the distal epiphysis of the shoulder. In general, the totality of all variables has a low level of discrimination (Wilkes Lambda statistics = 0.531; F = 5.521; p <0.01) between healthy and sick with OAB women between the ages of 17 and 25 years. The definition of the classification index (Df) is given in the form of equations, where the classification of patients with OAB women between the ages of 17 and 25 years is possible at a value of Df, close to 222.4, and to healthy women between the ages of 17 and 25 years, at a value of Df close to 228.3:

Df (*for patients with OAB women aged from 17 to 25 years*) = width of the distal epiphysis of the shoulder x 4.130 + conjugata externa x 15.93 - muscle mass component of the body for AIN x 0.154 + forearm girth in the upper third x 5.802 - 222.4;

Df (*for healthy women between the ages of 17 and 25*) = width of the distal epiphysis of the shoulder x 2.115 + conjugata externa x 17.31 + muscle component of the body weight for AIN x 0.252 + forearm circumcision in the upper third x 5.208 - 228.3;

where (here and in the future), *the width of distal epiphyses of long tubular limb bones* - in cm; *the size of the pelvis* - in cm; *indicators of the body weight composition* - in kg; *girth dimensions of the body* - in cm.

When taken into account *anthropo-somatotypological indicators*, the discriminatory function covers 95.9% of patients with OAB and 82.1% of healthy women *aged from 26 to 35 years*. In general, the model is correct in 90.9% of cases. Between healthy and sick with OAB women between the ages of 26 and 35 discriminatory variables are dist. Intertrochanterica, hip circumference, conjugata externa, mesomorphic component of the somatotype by Heath-Carter, width of the distal epiphysis of the forearm, fat mass of the body mass behind Matiegka, upper arm circumference and shoulder girth. The largest contribution to discrimination between healthy and sick OAB women between the ages of 26 and 35 make dist. Intertrochanterica and width of the distal epiphysis of the forearm. In general, the aggregate of all variables has an average level of discrimination (Wilkes Lambda statistics = 0.386; F = 13.52; p <0.001) among healthy and sick OAB women aged from 26 to 35 years. The classification indices (Df) for different groups of women, depending on the characteristics of anthropo-somatotypological indicators, have the form of the following equations:

Df (*for OAB patients women aged from 26 to 35 years*) = dist. Intertrochanterica x 111.5 - hip circumference x 0.553 - conjugata externa x 11.02 - mesomorphic component of the somatotype according to Heath-Carter x 2.967 - width of the distal epiphysis of the forearm x 8.813 + fat mass of the body by Matiegka x 1.643 - upper arm circumference x 4.591 + shoulder girth x 5.003 - 1558;

Df (*for healthy women between the ages of 26 and 35*) = dist. Intertrochanterica x 115.2 - hip circumference x 0.720 - conjugata externa x 11.90 - mesomorphic component by Heath-Carter x 2.496 - width of the distal epiphysis of the forearm x 14.51 + fat component on Matiegka x 3.005 - forearm circumference in the upper third x 5.241 + shoulder girth x 5.417 - 1625;

where (here and in the future), *components of the somatotype* - in points.

When considering *anthropo-somatotypological indicators*, the discriminatory function covers 100% of patients with OAB and 72.7% of healthy women *between the ages of 36 and 41 years*. In general, the model is correct in 89.3% of cases. Between healthy and OAB patients 36-41-year-old women discriminant variables are the width of distal epiphysis of the shin and body length. The greatest contribution to discrimination between healthy and sick with OAB women aged from 36 to 41 years is the size of the width of the distal epiphysis of the shin. In general, the totality of all variables has a low level of discrimination (Wilkes Lambda statistics = 0.445; F = 15.62; p <0.001) among healthy and sick with OAB women aged from 36 to 41 years. The classification indices (Df) for different groups of women, depending on the characteristics of anthropo-somatotypological indicators, have the form of the following equations:

Df (*for patients with OAB, women aged from 26 to 35 years*) = width of the distal foot of the epiphysis x 2.084 + body length x 4.667 - 398.2;

Df (*for healthy women between in ages of 26-35*) = - width of the distal epiphysis of the leg x 1.005 + body length x 4.926 - 421.6;

where, the *longitudinal dimensions of the body* - in cm.

In determining the significance of discriminatory functions with the help of criterion ?2, it was established that a reliable interpretation of the classification indices obtained between healthy and sick on OAB women of different age groups is possible, depending on the characteristics of anthropo-somatotypological indicators.

With regard to the *features of the hormonal background*, the discriminatory function covers 100% of patients with OAB and 100% healthy women *between the ages of 17*

and 25 years. Between healthy and OAB patients in the 17-25 age group discriminant variables are the level of estradiol at 16 weeks postpartum and the level of prolactin in the first trimester of pregnancy. The greatest contribution to discrimination between healthy and sick with OAB in women aged from 17 to 25 years has the value of estradiol at 16 weeks of postpartum. In general, the totality of all variables has a low level of discrimination (Wilkes Lambda statistics = 0.619; F = 131.4; p <0.001) among healthy and sick with OAB in women between the ages of 17 and 25 years. The classification (Df) for different groups of women, depending on the characteristics of the indicators of the hormonal background, has the form of the following equations:

Df (*for women with OAB in age 17-25 years*) = - estradiol in 16 weeks of postpartum period x 0.023 + prolactin in the first trimester of pregnancy x 0.574 - 56.43;

Df (*for healthy women between the ages of 17 and 25*) = estradiol at 16 weeks of postpartum x 0.030 + prolactin in the first trimester of pregnancy x 0.303 - 12.97;

where (here and thereafter), *estradiol* - in pg/ml; *prolactin* - in ng/ml.

When considering the *indicators of the hormonal background*, the discriminatory function covers 100% of patients with OAB and 100% healthy women between the ages of 26 and 35 years. Between healthy and OAB patients women *aged from 26 to 35 years*, discriminant variables are estradiol levels at 16 weeks postpartum, testosterone in the third trimester of pregnancy, estradiol in the third trimester of pregnancy, prolactin in the third trimester of pregnancy, estradiol in the first trimester of pregnancy, and testosterone levels in the first trimester of pregnancy. The greatest contribution to discrimination between healthy and sick OAB women aged from 26 to 35 years has the value of estradiol at 16 weeks of postpartum period. In the whole, the totality of all variables has a low level of discrimination (Wilkes Lambda statistics = 0.493; F = 224.9; p <0.001) among healthy and sick OAB women aged from 26 to 35 years. Classification indicators (Df) for different groups of pregnant women, depending on the characteristics of the hormonal background, look like the following equations:

Df (*for patients with OAB women aged from 26 to 35 years*) = estradiol at 16 weeks postpartum period x 0.056 + testosterone in the third trimester of pregnancy x 23.07 + estradiol in the third trimester of pregnancy x 0.005 + prolactin in the third trimester of pregnancy x 0.242 - estradiol in first the trimester of pregnancy x 0.002 - testosterone in the first trimester of pregnancy x 1.057 - 103.7;

Df (*for healthy women aged from 26 to 35 years*) = estradiol at 16 weeks postpartum x 0.312 - testosterone in the third trimester of pregnancy x 17.83 + estradiol in the third trimester of pregnancy x 0.008 + prolactin in the third trimester of pregnancy x 0.171 + estradiol in the first trimester of pregnancy x 0.002 + testosterone in the first trimester of pregnancy x 28.65 - 134.3;

where (here and in the future), *testosterone* - nmol/l.

With regard to the *indicators of the hormonal background*, the discriminatory function covers 100% of patients with OAB and 100% of healthy pregnant women *aged from 36 to 41 years*. Among healthy and sick with OAB women between the ages of 26 and 35 discriminant variables in the third trimester are estradiol and estradiol at 16 weeks of postpartum. The greatest contribution to discrimination between healthy and sick OAB in women aged from 36 to 41 years has the value of estradiol in the third trimester of pregnancy. In general, the aggregate of all variables has an average level of discrimination (Wilkes Lambda statistics = 0.371; F = 207.4; p <0.001) among healthy and sick with OAB women between the ages of 36 and 41 years. Classification indicators (Df) for different groups of women, depending on the characteristics of the hormonal background, has the form of the following equations:

Df (*for patients with OAB women aged from 36 to 41 years*) = estradiol in the third trimester of pregnancy x 0.020 + estradiol in 16 weeks postpartum period x 0.450 - 276.0;

Df (*for healthy women between the ages of 36 and 41*) = estradiol in the third trimester of pregnancy x 0.032 + estradiol at 16 weeks postpartum period x 0.664 - 361.9.

In determining the significance of discriminatory functions with the help of criterion χ^2, it is established that a reliable interpretation of the classification indices obtained between healthy and sick on OAB women in all age groups is possible, depending on the peculiarities of the hormonal background.

Discussion

Taking into account that among the risk factors for the development of urinary incontinence in women an important place have heredity [11, 28], metabolic syndrome and overweight [24, 26], age [9] it is quite understandable to study the possibility of OAB in pregnant women of different age groups depending on the characteristics of anthropo-somatotypological indicators or hormonal background.

When taken into account *anthropometric and somatotypological indicators* it was established that in women of different age groups, the discriminant model of the possibility of OAB occurrence covers 86.7% of pregnant women aged from 17 to 25 years, 90.9% of pregnant women aged from 26 to 35, and 89.3% of pregnant women aged from 36 to 41 years. Between healthy and OAB patients, of 17-25 years of age, discriminating variables are the width of the distal epiphysis of the shoulder which has the greatest contribution to discrimination between healthy and patients, conjugata externa, upper arm circumference and muscle mass of the body by AIN; respectively in women aged from 26 to 35 years - dist. Intertrochanterica and width of the distal epiphyses of the forearm which have the greatest contribution to discrimination, conjugata externa, hips girth, upper limb and shoulder, a mesomorphic component of the somatotype by the J. Carter and B. Heath and the fat mass of the body mass at Matiegka; respectively, in women between the ages of 36 and 41, the width of the distal epiphysis of the shin that has the greatest contribution

to discrimination and body length. In general, the aggregate of all variables has an average level of discrimination (Wilkes Lambda statistics = 0.386; p <0.001) only among healthy and sick with OAB women aged from 26 to 35; and women of other age groups have a low level of discrimination, respectively, between women of the ages from 17 to 25 (Wilkes Lambda statistics = 0.531; p <0.01) and between women between the ages of 36 and 41 (Wilkes Lambda statistics = 0.445; p <0.001).

Attention is drawn to the fact that in all age groups, the greatest contribution to discrimination between healthy and sick with OAB women, in most cases, make the parameters of the width of distal epiphyses of long limb bones, which are highly genetically determined indicators [14].

Taking into account the *peculiarities of the hormonal background*, it has been established that in women of all age groups, the discriminant model of the possibility of OAB occurrence covers 100% of pregnant women. Between healthy and OAB patients between the ages of 17 and 25, discriminant variables are the level of estradiol at 16 weeks postpartum, which has the greatest contribution to discrimination and the level of prolactin in the first trimester of pregnancy; respectively, in women aged from 26 to 35 years - the level of estradiol in the 16 weeks postpartum, which has the greatest contribution to discrimination, estradiol in the first and third trimesters of pregnancy, prolactin in the third trimester of pregnancy, and testosterone in the first and third trimesters of pregnancy; respectively, in women between the ages of 36 and 41 - estradiol in the third trimester of pregnancy, which has the largest contribution to discrimination and estradiol in the 16 weeks postpartum period. In general, the aggregate of all variables has an average level of discrimination (Wilkes Lambda statistics = 0.371; p <0.001) only between healthy and sick with OAB women between the ages of 36 and 41; and women of other age groups have a low level of discrimination, respectively, between women of the ages from 17 to 25 (Wilkes Lambda statistics = 0.619; p <0.001) and between women aged from 26 to 35 (Wilkes Lambda statistics = 0.493; p <0.001).

Attention is drawn to the fact that in all age groups, the greatest contribution to discrimination between healthy and sick with OAB women has the level of estradiol. As is known, estrogens are female hormones of "youth", as they improve blood supply to the urethra and bladder, increase the elasticity of the connective tissue and smooth muscle fibers, which form the wall of the urethra, ensure the presence of mucus in the lumen of the urethra to maintain adequate intraurethral pressure [4].

The application of the integrated approach in the study of disorders of urination will improve the criteria for diagnosis, which in turn will enable to more accurately approach the issue of early detection of risk groups for the development of OAB to increase the effectiveness of prevention of urinary tract disorders at the pre-pregnancy stage.

Conclusions

In the constructed by discriminant analysis reliable models of the possibility of OAB occurrence, depending on anthropo-somatotypological or hormonal indicators, the greatest contribution to discrimination between healthy and sick on OAB pregnant women of different age groups, in most cases, have indicators of the width of distal epiphyses of long limb bones or estradiol level.

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МОДЕЛЮВАННЯ ЗА ДОПОМОГОЮ ДИСКРИМІНАНТНОГО АНАЛІЗУ МОЖЛИВОСТІ ВИНИКНЕННЯ ГІПЕРАКТИВНОГО СЕЧОВОГО МІХУРА У ЖІНОК РІЗНОГО ВІКУ В ЗАЛЕЖНОСТІ ВІД АНТРОПО-СОМАТОТИПОЛОГІЧНИХ ПОКАЗНИКІВ АБО ГОРМОНАЛЬНОГО ФОНУ

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Однією з найбільш важливих проблем сучасної урогінекології є удосконалення лікувально-діагностичного алгоритму та профілактики синдрому гіперактивного сечового міхура (ГАСМ). Мета роботи - побудувати та провести аналіз дискримінантних моделей можливості виникнення ГАСМ у вагітних жінок різних вікових груп в залежності від особливостей антропо-соматотипологічних показників або гормонального фону. 75 вагітним жінкам з клінічними ознаками синдрому ГАСМ та 60 практично здоровим вагітним жінкам проведено гормональний скринінг в I і III триместрах вагітності та в 16 тижнів післяпологового періоду за допомогою радіоімунологічного та імуноферментного методів (визначали рівні естрадіолу, прогестерону, тиреотропного гормону та тестостерону). Проведено антропометрію за методикою В. В. Бунака, визначені компоненти соматотипу за методикою J. Carter і B. Heath, а також показники компонентного складу маси тіла - за методикою J. Matiegka та Американського інституту харчування (AIX). За віком усі вагітні були розподілені на 3 підгрупи: I - від 17 до 25 років, II - від 26 до 35років, III - від 36 до 41 років. Дискримінантний аналіз можливості виникнення ГАСМ в залежності від антропо-соматотипологічних або гормональних показників у жінок різних вікових груп проведено з використанням ліцензійної програми Statistica 5.5. При урахуванні антропо-соматотипологічних показників у жінок віком від 17 до 25 років модель коректна в 86,7% випадків; у жінок віком від 26 до 35 років - в 90,9% випадків; у жінок віком від 36 до 41 року - в 89,3% випадків. Між здоровими та хворими на ГАСМ жінками віком від 17 до 25 років дискримінантними змінними є ширина дистального епіфіза плеча (має найбільший внесок в дискримінацію), conjugata externa, м'язовий компонент маси тіла за AIX та обхват передпліччя у верхній третині; жінками віком від 26 до 35 років - dist. Intertrochanterica, ширина дистального епіфіза передпліччя (мають найбільший внесок в дискримінацію), обхват стегна, conjugata externa, мезоморфний компонент соматотипу за Хіт-Картером, жировий компонент маси тіла за Матейко, обхват передпліччя у верхній третині та обхват плеча; жінками віком від 36 до 41 року - ширина дистального епіфіза гомілки (має найбільший внесок в дискримінацію) та довжина тіла. В цілому сукупність усіх змінних має незначний рівень дискримінації між здоровими та хворими на ГАСМ жінками віком від 17 до 25 років (статистика Уілкса лямбда = 0,531; F = 5,521; p<0,01) та віком від 36 до 41 року (статистика Уілкса лямбда = 0,445; F = 15,62; p<0,001), а між жінками віком від 26 до 35 років - середній рівень дискримінації (статистика Уілкса лямбда = 0,386; F = 13,52; p<0,001). При урахуванні особливостей гормонального фону у жінок усіх вікових груп модель

коректна в 100% випадків. Між здоровими та хворими на ГАСМ вагітними віком від 17 до 25 років дискримінантними змінними є рівень естрадіолу в 16 тижнів післяпологового періоду (має найбільший внесок в дискримінацію) та рівень пролактину в I триместрі вагітності; жінками віком від 26 до 35 років - рівень естрадіолу в 16 тижнів післяпологового періоду (має найбільший внесок в дискримінацію), тестостерону в III триместрі вагітності, естрадіолу в III триместрі вагітності, пролактину в III триместрі вагітності, естрадіолу в I триместрі вагітності та рівень тестостерону в I триместрі вагітності; жінками віком від 36 до 41 року - естрадіол в III триместрі вагітності (має найбільший внесок в дискримінацію) та естрадіол в 16 тижнів післяпологового періоду. В цілому сукупність усіх змінних має незначний рівень дискримінації між здоровими та хворими на ГАСМ жінками віком від 17 до 25 років (статистика Уілкса лямбда = 0,619; F = 131,4; p<0,001) та віком від 26 до 35 років (статистика Уілкса лямбда = 0,493; F = 224,9; p<0,001), а між жінками віком від 36 до 41 років - середній рівень дискримінації (статистика Уілкса лямбда = 0,371; F = 207,4; p<0,001). Таким чином за допомогою дискримінантного аналізу побудовані достовірні моделі можливості виникнення ГАСМ в залежності від антропо-соматотипологічних або гормональних показників у жінок різних вікових груп. В усіх вікових групах найбільший внесок у дискримінацію між здоровими і хворими на ГАСМ вагітними жінками, в більшості випадків, мають показники ширини дистальних епіфізів довгих трубчастих кісток кінцівок або рівень естрадіолу.

Ключові слова: *дискримінантний аналіз, вагітні жінки, синдром гіперактивного сечового міхура, антропометрія, гормони, вік.*

МОДЕЛИРОВАНИЕ С ПОМОЩЬЮ ДИСКРИМИНАНТНОГО АНАЛИЗА ВОЗМОЖНОСТИ ВОЗНИКНОВЕНИЯ ГИПЕРАКТИВНОГО МОЧЕВОГО ПУЗЫРЯ У ЖЕНЩИН РАЗНОГО ВОЗРАСТА В ЗАВИСИМОСТИ ОТ АНТРОПО-СОМАТОТИПОЛОГИЧЕСКИХ ПОКАЗАТЕЛЕЙ ИЛИ ГОРМОНАЛЬНОГО ФОНА

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Одной из наиболее важных проблем современной урогинекологии является совершенствование лечебно-диагностического алгоритма и профилактики синдрома гиперактивного мочевого пузыря (ГАМП). Цель работы - построить и провести анализ дискриминантных моделей возможности возникновения ГАМП у беременных женщин разных возрастных групп в зависимости от особенностей антропо-соматотипологических показателей или гормонального фона. 75 беременным женщинам с клиническими признаками синдрома ГАМП и 60 практически здоровым беременным женщинам проведен гормональный скрининг в I и III триместрах беременности и в 16 недель послеродового периода с помощью радиоиммунологического и иммуноферментного методов (определяли уровни эстрадиола, прогестерона, тиреотропного гормона и тестостерона). Проведено антропометрию по методике В. В. Бунака, определенные компоненты соматотипа по методике J. Carter и B. Heath, а также показатели компонентного состава массы тела - по методике J. Matiegka и Американского института питания (АИП). По возрасту все беременные были разделены на 3 подгруппы: I - от 17 до 25 лет, II - от 26 до 35 лет, III - от 36 до 41 лет. Дискриминантный анализ возможности возникновения ГАМП в зависимости от антропо-соматотипологических или гормональных показателей у женщин разных возрастных групп проведено с использованием лицензионной программы "Statistica 5.5". При учете антропо-соматотипологических показателей у женщин в возрасте от 17 до 25 лет модель корректна в 86,7% случаев; у женщин в возрасте от 26 до 35 лет - в 90,9% случаев; у женщин в возрасте от 36 до 41 года - в 89,3% случаев. Между здоровыми и больными ГАМП женщинами в возрасте от 17 до 25 лет дискриминантные переменными является ширина дистального эпифиза плеча (имеет наибольший вклад в дискриминацию), conjugata externa, мышечный компонент массы тела за АИП и обхват предплечья в верхней трети; женщинами в возрасте от 26 до 35 лет - dist. Intertrochanterica, ширина дистального эпифиза предплечья (имеют наибольший вклад в дискриминацию), обхват бедра, conjugata externa, мезоморфный компонент соматотипа по Хит-Картеру, жировой компонент массы тела за Матейко, обхват предплечья в верхней трети и обхват плеча; женщинами в возрасте от 36 до 41 года - ширина дистального эпифиза голени (имеет наибольший вклад в дискриминацию) и длина тела. В целом совокупность всех переменных имеет незначительный уровень дискриминации между здоровыми и больными ГАМП женщинами в возрасте от 17 до 25 лет (статистика Уилкса лямбда = 0,531; F = 5,521; p <0,01) и в возрасте от 36 до 41 года (статистика Уилкса лямбда = 0,445; F = 15,62; p <0,001), а между женщинами в возрасте от 26 до 35 лет - средний уровень дискриминации (статистика Уилкса лямбда = 0,386; F = 13,52; p <0,001). При учете особенностей гормонального фона у женщин всех возрастов модель корректна в 100% случаев. Между здоровыми и больными ГАМП беременными в возрасте от 17 до 25 лет дискриминантными переменными являются уровень эстрадиола в 16 недель послеродового периода (имеет наибольший вклад в дискриминацию) и уровень пролактина в I триместре беременности; женщинами в возрасте от 26 до 35 лет - уровень эстрадиола в 16 недель послеродового периода (имеет наибольший вклад в дискриминацию), тестостерона в III триместре беременности, эстрадиола в III триместре беременности, пролактина в III триместре беременности, эстрадиола в I триместре беременности и уровень тестостерона в I триместре беременности; женщинами в возрасте от 36 до 41 года - эстрадиол в III триместре беременности (имеет наибольший вклад в дискриминацию) и эстрадиол в 16 недель послеродового периода. В целом совокупность всех переменных имеет незначительный уровень дискриминации между здоровыми и больными ГАСМ женщинами в возрасте от 17 до 25 лет (статистика Уилкса лямбда = 0,619; F = 131,4; p <0,001) и в возрасте от 26 до 35 лет (статистика Уилкса лямбда = 0,493; F = 224,9; p <0,001), а между женщинами в возрасте от 36 до 41 лет - средний уровень дискриминации (статистика Уилкса лямбда = 0,371; F = 207,4; p <0,001). Таким образом с помощью дискриминантного анализа построены достоверные модели возможности возникновения ГАМП в зависимости от антропо-соматотипологических или гормональных показателей у женщин разных возрастных групп. Во всех возрастных группах наибольший вклад в дискриминацию между здоровыми и больными ГАМП беременными женщинами, в большинстве случаев, имеют показатели ширины дистальных эпифизов длинных трубчатых костей конечностей или уровень эстрадиола.

Ключевые слова: *дискриминантный анализ, беременные женщины, синдром гиперактивного мочевого пузыря, антропометрия, гормоны, возраст.*