



FEATURES OF CLINICAL AND HORMONAL DISORDERS IN WOMEN WITH VARIOUS FORMS OF HYPERANDROGENISM

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✓ *Resume*

As a result of a thorough study of anamnestic information: - family history; - age of menarche; - generative history; - the nature of menstrual dysfunction; - the time of manifestations of hirsutism; - the nature of the spread of hirsutism; - height of patients; - according to the ultrasound data of the studied women, we were able to assume the etiology of hyperandrogenism (HA) and divide 256 women with clinical manifestations of HA and impaired reproductive function into two groups: HA of ovarian genesis and HA of adrenal genesis and study the hormonal status depending on the genesis of HA. The LH indicators in all patients with HA were significantly higher than in the control group, while the FSH indicators in both groups were normal, however, the ratio of the LH/FSH coefficient was 3.04 ± 0.58 in the first group, in the second group it was $2, 19 \pm 0.89$ ($p=0.07$), while the indicators of biochemical markers of hyperandrogenism of free testosterone, DHEA-S and 17-OHP were higher in women with adrenal HA than in the group of patients with ovarian HA compared with the control group ($p>0.05$).

Key words: infertility, hyperandrogenism, menstrual dysfunction, miscarriage, reproductive age.

ОСОБЕННОСТИ КЛИНИЧЕСКИХ И ГОРМОНАЛЬНЫХ НАРУШЕНИЙ У ЖЕНЩИН С РАЗЛИЧНЫМИ ФОРМАМИ ГИПЕРАНДРОГЕНИИ

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✓ *Резюме*

В результате тщательного изучения анамнестических сведений: - семейный анамнез; - возраст наступления менархе; - генеративный анамнез; - характер нарушения менструальной функции; - время появления гирсутизма; - характер распространения гирсутизма; - роста пациенток; - по данным УЗИ исследуемых женщин нам позволило предположить этиологию гиперандрогении (ГА) и разделить 256 женщин с клиническими проявлениями ГА и нарушением репродуктивной функции на две группы: ГА яичникового генеза и ГА надпочечникового генеза и изучить гормональный статус в зависимости от генеза ГА. Показатели ЛГ у всех пациенток с ГА были достоверно выше, чем в контрольной группе, при этом показатели ФСГ в обеих группах были в норме, однако соотношение коэффициента ЛГ/ФСГ составило $3,04 \pm 0,58$ в первой группе, во второй группе $2,19 \pm 0,89$ ($p=0,07$), при этом показатели биохимических маркеров гиперандрогении свободного тестостерона, ДГЭА-С и 17-ОНП были выше у женщин с ГА надпочечникового генеза, чем в группе пациенток с овариальной ГА по сравнению с группой контроля ($p>0,05$).

Ключевые слова: бесплодие, гиперандрогения, нарушение менструальной функции, невынашивание, репродуктивный возраст.

HIPERANDROGENIZMNING TURLI SHAKLLARI BO'LGAN AYOLLARDA KLINIK VA GORMONAL BUZILISHLARNING XUSUSIYATLARI

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✓ Rezyume

Anamnestik ma'lumotlarni to'liq o'rganish natijasida: - oilaviy anamnez;- hayz ko'rish yoshi; - generativ anamnez; - hayz ko'rish buzilishining harakteri; - girsutizmning paydo bo'lish vaqti; - girsutizmning tarqalish harakteri; - bemorlarning o'sishi; - o'rganilgan ayollarning ultratovush tekshiruvi ma'lumotlariga ko'ra, biz giperandrogenizm (GA) etiologiyasini tahmin qila oldik va GA klinik ko'rinishi va reproduktiv funksiyasi buzilgan 256 ayolni ajrata oldik. Ikki guruhga bo'lindi: tuxumdonlar genezi GA va buyrak usti bezlari genezi va GA geneziga qarab gormonal holatni o'rganish. GA kuzatilgan barcha bemorlarda LG ko'rsatkichlari nazorat guruhiga qaraganda sezilarli darajada yuqori edi, ikkala guruhdagi FSG ko'rsatkichlari normal edi, ammo birinchi guruhda LG / FSG nisbati $3,04 \pm 0,58$ ni tashkil etdi. ikkinchi guruhda $2,19 \pm 0,89$ ($p = 0,07$), erkin testosteron, DGEA-S va 17-OP giperandrogenizmining biokimyoviy belgilari buyrak usti GA bo'lgan ayollarda tuxumdonlar GA bo'lgan nazorat guruhi bemorlarga nisbatan yuqori bo'lgan. ($p > 0,05$).

Kalit so'zlar: bepushtlik, giperandrogenizm, hayz davrining buzilishi, abort, reproduktiv yosh.

Relevance

Hyperandrogenism syndrome is a pathological condition caused by increased secretion and impaired metabolism of androgens, which combines diseases similar in clinical manifestations, but different in pathogenesis. Hyperandrogenism syndrome, according to a number of authors, occurs in 10-20% of women of reproductive age [2, 3]. Hyperproduction of androgens in the female body leads to disorders of the reproductive system: menstrual disorders (50-70%), infertility (60-80%), miscarriage (20-30%) [2,5]. This problem is not only medical, but also social, since some patients of reproductive age with HA are at risk of developing mental and behavioral disorders that reduce their quality of life [11].

Hyperandrogenism is one of the difficult-to-diagnose pathologies of the endocrine system in women of reproductive age [10]. Most patients develop the pathology during puberty, however, in a number of patients, this condition may also be observed at an earlier period. The lack of clear boundaries between the norm and pathology in this age range causes a lot of controversy [10,11]. The study of the problem of ovarian dysfunction against the background of hyperandrogenism syndrome is associated with certain difficulties due to the polyetiology, heterogeneity and polymorphism of the disease. The clinical manifestations of HA are diverse, allowing the doctor to form a hypothesis during the initial visit of the patient, i.e. with a high degree of probability to assume the presence or absence of certain deviations in her hormonal status and determine the level of damage. At present, there is an obvious tendency to shift emphasis from clinical manifestations to laboratory diagnostics. The variety of available methods for the quantitative determination of hormones contributes to the unreasonable chaotic indications for laboratory tests.

Given the above, **the purpose of this study** was to study the characteristics of clinical and hormonal disorders in patients with various forms of hyperandrogenism.

Materials and methods

256 women with clinical manifestations of HA and impaired reproductive function were under our supervision, who came to the consultative clinic of Republican Specialized Scientific and Practical Medical Center for Obstetrics and Gynecology. The anamnesis of the disease, the nature of the clinical manifestations of HA and the peculiarities of the formation of the menstrual cycle, ultrasound examination of the uterus, ovaries, thyroid gland and hormonal examination (prolactin, luteinizing hormone (LH) and follicle-stimulating hormone (FSH), free testosterone (T), 17-hydroxyprogesterone (17-OHP), dehydroepiandrosterone-sulphate (DHEA-S), thyroid-stimulating hormone (TSH), free thyroxine (fT_4), were analyzed.

We conducted an ultrasound examination on a modern ultrasound machine of the expert class MindrayDC-70 with a sensor sensitivity of 7.5 MHz, preference was given to transvaginal access. The patients with regularly menstruating were examined in the early follicular phase (3-5 days of the cycle), and patients with opso-/amenorrhea - on the day of coming or on days 3-5 of induced bleeding after the progestogen test. The follicles were counted both in the longitudinal, transverse and anteroposterior sections of the ovaries, the volume of the ovaries, the average size of the follicles

measured in three sections, and the index of the ratio of the area of the stroma to the area of the ovary. The hormonal study was carried out on an enzyme immunoassay analyzer Mindray 96 MR-96A China 2014. Statistical processing of the study results was carried out by conventional methods using a personal computer, Microsoft Word 2016, Microsoft Excel programs.

Results and discussion

At the first stage of the research, the anamnesis of the disease, the indicators of an objective and anthropometric study were analyzed, an ultrasound examination of the uterus and ovaries, and the thyroid gland was conducted. The age of the examined women ranged from 18 to 35 years, which averaged 25.8 ± 3.28 years. The body mass index (BMI) indicated the presence of metabolic disorders in patients. Of the total number of patients examined, more than half of 137 (53.5%) patients were overweight with average BMI of 27.45 ± 0.18 and 58 (22.6%) women were obese with BMI of 33.15 ± 3.7 , 55 (21.5%) patients had a normal body weight with BMI of 23.11 ± 0.14 , and 6 (2.4%) women had a body weight deficiency with average BMI of 18.1 ± 0.11 .

The main complaints, when they came, were menstrual disorders in the form of dysfunctional uterine bleeding: oligo- or opsomenorrhea, amenorrhea, infertility, miscarriage, acne, oily seborrhea, excessive hair growth, overweight. Clinical signs of menstrual disorders were detected in 212 (82.8%) patients, menstrual irregularities were not observed in the remaining 44 (17.2%) women. Of these, 178 (84%) patients had menstrual disorders in the form of oligo- and opsomenorrhea, 24 (11.3%) women had hyperpolymenorrhea, 156 (73.6%) women had chronic anovulation and 38 (18%) patients had amenorrhea.

87 (34%) patients observed clinical manifestations after marriage, 52 (20.3%) patients observed after stressful situations, 136 (53.12%) women had it from the onset of menarche.

The average age of onset of menarche was 12.5 ± 2.8 years, of which 21 (8.2%) patients had earlier onset of menarche at the age of 9-10 years, most of 198 (77.3%) had timely onset of menarche, from whom 26 patients (13%) had at the age of 10-11 years, 93 (47%) patients had at the age of 12-13 years, 79 patients (40%) had at the age of 13-14 years and 36 women (14%) had later menarche after 15-16 years old.

154 patients (60.15%) were diagnosed with female infertility. Primary infertility was 117 (76%) and secondary was 37 (24%) cases. The average duration of infertility was 4.01 ± 0.18 years. Miscarriage was observed in 28 (11%) women.

During the clinical examination, hirsutism was established in all examined patients (the average hirsutism number was 17.2 ± 0.3 points on the Ferriman-Gallway scale, mild hirsutism prevailed in 203 (79.3%) of them, moderate hirsutism was found in 27 (10.5%) of participants, pronounced hirsutism was detected in 26 (10.2%) patients). There were also other clinical manifestations of hyperandrogenism, such as acne was found in 127 (49.6%) patients, negroid acanthosis in 58 (22.6%) of participants, alopecia in 28 (11%), clitoromegaly in 17 (6.6%), hoarseness in 11 (4.3%) In terms of the prevalence of increased hair growth, it was noted mainly on the upper lip and chin in 227 (88.67%) women. According to some authors [5,6] with PCOS, there is hair growth on the upper lip and chin, in 28 (11%) patients, more pronounced hirsutism was noted on the back, along the inner surface of the thighs, which is typical for adrenal HA. The subsequent analysis of the clinical manifestations and the nature of menstrual irregularities allow us to take the first steps towards clarifying the genesis of hyperandrogenism. According to the literature data [6], the manifestation of PCOS occurs in adolescence, as a rule, menarche occurs early or on time, and during the first months or years they can be regular, with Congenital adrenal hyperplasia (CAH), menarche most often occurs late, rarely on time [8], and the time of appearance of hirsutism: from the period of menarche is typical for PCOS [3,10]; before the onset of menstruation - from adrenarche, when physiological activation of the androgenic function of the adrenal cortex is noted, which is necessary for the development of secondary sexual characteristics - for Congenital adrenal hyperplasia (CAH) [7,8,9]. In the study by Arlt et al. short height was noted in patients with Congenital adrenal hyperplasia (CAH) [1]. An analysis of the anamnestic data of the generative dysfunction showed that early pregnancy losses were observed equally often in both study groups. In group I, the majority of patients 68.8% had primary infertility, while secondary infertility was noted in most women from the second group. Further analysis of the results showed that patients of group II had no history of menstrual irregularities and

habitual pregnancy losses were noted in the early stages of gestation, which is typical for Congenital adrenal hyperplasia (CAH) [7,9].

Based on the analysis of anamnestic data: the nature and severity of hirsutism, data on menarche and the age of onset of hypertrichosis, we assumed that 227 (88.67%) patients had HA of ovarian genesis in group I, 29 (11.33%) patients had adrenal genesis in II group.

Table 1. Clinical differences of HA of various genesis.

Parameters under study	Examined groups of women with HA	
	ovariogenesis (n=227)	adrenal genesis (n=29)
Average age (years old)	25,4 ± 2,28	25,6 ± 3,08
Average age at menarche	12,50 ± 1,27	14,93 ± 0,9
generative dysfunction	More often primary infertility	more often secondary infertility and early pregnancy loss
Menstrual dysfunction	more often, oligo- and anovulation	more often normal, luteal phase disorder, amenorrhea
Hypertrichosis	predominantly on the upper lip and chin	predominantly hair growth in the waist, inner thigh and perianal region
Hirsutism (on the Ferriman-Gallway scale)	mild to moderate hirsutism prevails	more pronounced hirsutism
hirsutismscore	14,9 ± 1,35	24,5 ± 3,5
Time of onset of hirsutism	since menarche	since adrenarche
Height (mean, cm)	167,6 ± 7,4 cm	152,7 ± 6,3 cm

The analysis of the indicators of a comprehensive gynecological and ultrasound examination showed that in 161 (63%) cases, the size of the uterus was less than normal (hypoplasia of I and II degrees), and in 95 (37%) - within the normal range.

Currently, ultrasound using a transvaginal probe allows getting a clear picture of the internal structure of the ovaries, assessing the state of the stroma and the follicular apparatus (see Table No. 2). In the final document of the Rotterdam Consensus, the criteria was fixed that PCOS remains a diagnosis that requires the exclusion of other known disorders that are manifested by universal clinical signs of hyperandrogenism, and therefore can mimic and proceed "under the guise" of PCOS. The main symptoms of PCOS (determining the diagnosis) are: hyperandrogenism, ovulatory dysfunction, polycystic ovarian morphology, which is determined using ultrasound [4]. Ultrasound examination of patients from the first group (HA of ovarian origin) revealed a significant increase in ovarian volume depending on the control group due to hyperechoic stroma, the average volume of the left ovary was 15.68 ± 0.5 cm³, the right ovary 13.84 ± 0.37 cm³ (normal is 8.6 ± 0.3 cm³); with many follicles - an average of 15.08 ± 1.5 pcs on the left, 16.4 ± 0.97 pcs on the right; 2-9 mm in diameter and averaged 6.25 ± 0.4 mm on the left, 5.7 ± 0.8 mm on the right, located along the periphery of the ovaries. The total area of the stroma was 2.4 ± 0.6 cm². Our data are consistent with the characteristics of the echo picture for PCOS according to the Rotterdam Consensus, in which the number of follicles is more than 12-15 pcs, located along the periphery of the ovary and form an echo-negative rim like a "pearl necklace", while the diameter of the follicles is from 2 to 9 mm or ovarian volume > 10 cm³ in at least one ovary [4].

In ultrasound examination of the ovaries according to the literature data, polycystic ovaries were determined in 77% of those with CAH, but the increase in ovarian volume did not exceed 10 cm³ [9]. In women from the second group, there was a slight increase in the volume of the ovaries, depending on the control group, the average volume of the ovaries was 9.2 ± 0.4 cm³ on the left and 9.8 ± 0.21 cm³ on the right, the number of follicles did not exceed 8-10 pcs, on average amounted to 10.5 ± 0.8 pcs on the left and 11.03 ± 1.06 pcs on the right, follicle diameter from 4 - 12 mm, on average 6.83 ± 0.3 on the left and 7.5 ± 0.32 on the right of the cellular structure (Table 2).

Table 2. Ultrasound parameters of the examined women.

Indicators	Women of reproductive age		
	Study group		Control group (n=30)
	I group (n=227)	II group (n=29)	
Volume of the left ovary, cm ³	15,68±0,5*	9,2±0,4 *	5,82± 0,41**
Volume of the right ovary, cm ³	13,84± 0,37*	9,8±0,21*	5,6± 0,39**
Number of antral follicles in the left ovary	15,08±1,5*	10,5±0,8*	5,7 ±0,4**
Number of antral follicles in the right ovary	16,4±0,97*	11,03±1,06*	5,43± 0,38**
Follicle diameter of the left ovary, mm	6,25± 0,4*	6,83±0,3*	4,29 ±0,3**
Follicle diameter of the right ovary, mm	5,7± 0,8*	7,5±0,32*	4,6 ±0,43**

Note: * - differences relative to the data of 2 groups ($P < 0.01$), ** - differences relative to the data of the study group and the control group ($P < 0.05$).

The results of the studies show that in PCOS the number of antral follicles (NAF) and the volume (V) of the ovary are larger. On average NAF is 18.08 ± 1.5 pcs and V is 14.76 ± 0.43 cm³ rather than NAF is 10.5 ± 0.8 pcs and V is 9.5 ± 0.3 cm³ in Congenital adrenal hyperplasia (CAH).

The results of the interpretation of clinical and instrumental studies allowed us to form 2 groups of patients on the basis of the genesis of hyperandrogenism.

Based on the results of the analysis of the nature and severity of hair growth mainly on the upper lip and chin, the presence of acne, seborrhea, androgenetic alopecia, the early onset of menarche, menstrual dysfunction in the form of oligo or anovulation, the time of onset of hirsutism: from the period of menarche and according to ultrasound, an increase in ovarian volume due to the hyperechoic stroma with many antral follicles over 12-15 pcs, with a diameter of 2 to 9 mm, located along the periphery of the ovaries, we managed to form the 1st group of women, which amounted to 227 patients (88.67%) and put forward a hypothesis about ovarian HA origin.

A thorough study of the anamnestic information made it possible to assume the etiology of adrenal hyperandrogenism: - a family history of endocrine pathology and, in particular, infertility and miscarriage, including in the male line of kinship, which suggests the presence of an enzyme block in steroidogenesis in the non-classical form of congenital adrenal dysfunction (CAD); later than menarche; - the time of appearance of hirsutism: before the onset of menstruation - with adrenarche; short height of patients; on the basis of widespread hirsutism, hair growth predominantly in the waist, inner thigh and perianal region, clitorohegalia, hoarseness, pronounced male pattern baldness, severe forms of acne, however, according to the ultrasound data of the women studied, the average ovarian volume was normal and the number antral follicles did not exceed 9-10 pcs. Therefore, we put forward a hypothesis about the possible adrenal genesis of the identified HA and form group II of women, which amounted to 29 patients (11.33%).

According to some authors, Martin K. A., Anderson R. R. the most common cause of HA is polycystic ovarian syndrome (PCOS), which is detected in about 70% of women with HA, according to our data, out of the total number of examined 256 women, HA of ovarian genesis was found in approximately 227 (88.67%) patients, HA of adrenal genesis in 29 (11.33%).

This methodological approach allowed us to narrow down the range of necessary hormonal and instrumental examination methods and avoid difficulties in interpreting clinical and hormonal parameters.

The next stage of the research was the analysis of hormone levels depending on the genesis of HA. To do this, we compared the indicators of hormonal studies in two groups Table 2.

A hormonal study of patients revealed a slight increase in the level of LH in both groups compared to the control group and averaged 15.4 ± 0.67 mIU/ml in group I, 13.8 ± 0.16 mIU/ml in group II (normally the follicular phase $0.9-15$ mIU/ml), FSH indicators were in within the normal range in both groups and averaged 5.06 ± 0.21 mIU/ml and 6.33 ± 0.18 mIU/ml (normally the follicular phase is less than 10 mIU/ml), while the ratio of the LH/FSH coefficient was 3.04 ± 0.58 in group I, 2.18 ± 0.89 in group II. In all the women studied, the concentration of prolactin in the blood was normal and averaged $407.8 = 228.4$ mIU/ml.

In the women with ovarian HA, the concentration of free testosterone averaged 3.27 ± 0.06 ng/ml, while in the patients with adrenal HA, there was a moderate increase in indicators up to 5.7 ± 0.3 ng/ml (normally 0-4.1 ng/ml), the concentration of DHEA-S in the blood of the women in group I averaged 3.04 ± 0.09 ug/ml, in group II it was higher than the standard values up to 5.8 ± 2.95 ug/ml with a norm of 0.8-3.9 ug/ml. In the vast majority of our patients, the level of 17-OH-progesterone was normal, only 28 (11%) women of group II had higher than normal values and averaged 5.8 ± 2.8 nmol/L with a norm of 0.2-2.4 nmol/L. The biochemical criteria for adrenal hyperandrogenism today are considered to be an increase in blood concentrations of 17-ONP. An increase in testosterone levels more indicates their ovarian source only at normal concentrations of 17-ONP, since the participation of the ovaries and adrenal glands in the synthesis of testosterone is approximately the same – 30% each (Azziz R., Sanchez LA., 2004). Elevated concentrations of 17-OHP, as a precursor of testosterone, are also characteristic of PCOS. Therefore, only the determination of the content of various androgens in the blood cannot reliably indicate their source. To confirm the adrenal origin of androgens, we conducted a test with dexamethasone (DM) in women from group II and determined the concentration of 17-OHP, testosterone and DHEA-S in the blood before and after taking DM at 0.5 mg every 6 hours for 2 days (total 4 mg) and noted a decrease of indicators by more than 50-75%, which indicates the adrenal genesis of hyperandrogenism [9].

As for the thyroid status, the level of thyroid-stimulating hormone in the studied patients was normal, in group I it averaged 1.83 ± 0.05 mIU/ml, in group II it was 1.75 ± 0.07 mIU/ml. The levels of free T4 were within normal values in group I making up 11.4 ± 0.32 ng/ml, in group II it accounted for 22.9 ± 0.9 ng/ml. The level of TPO, on average, was 17.3 ± 0.49 ng/ml in group I, and 13.27 ± 0.57 ng/ml in group II, that is, it was within the normal range. Normal thyroid hormone levels indicate the absence of thyroid pathology, which excludes the presence of secondary polycystic ovaries.

Table 3. Indicators of hormonal parameters in the women depending on the genesis of hyperandrogenism

Parameters under study	Women of reproductive age with hyperandrogenism		Control Group n=30
	Group I n=227	Group II n=29	
FSH [<10 mIU/ml]	$5,06 \pm 0,21^*$	$6,33 \pm 0,18^*$	$3,17 \pm 0,15^{**}$
LH [0,9-15 mIU/ml]	$15,4 \pm 0,67^*$	$13,8 \pm 0,16^*$	$5,09 \pm 0,37^{**}$
LH/FSH ratio	$3,04 \pm 0,58^*$	$2,18 \pm 0,89^*$	$1,6 \pm 0,24^{**}$
DHEA-S [0,8-3,9 ug/ml]	$3,4 \pm 0,09^*$	$5,8 \pm 2,95^*$	$1,3 \pm 0,53^{**}$
Free Testosterone [0-4,1 ng/ml]	$3,27 \pm 0,06^*$	$5,7 \pm 0,3^*$	$1,35 \pm 0,21^{**}$
17-OH-progesterone [0,2-2,4 nmol/l]	$1,78 \pm 1,05^*$	$5,8 \pm 2,8^*$	$0,83 \pm 0,24^{**}$
TSH [0,4-4mkME/ml]	$1,83 \pm 0,05^*$	$1,75 \pm 0,07^*$	$1,24 \pm 0,12^{**}$
Free T4 [9,0-22,2 pmol/l]	$11,4 \pm 0,32^*$	$22,9 \pm 0,9^*$	$13,75 \pm 0,43^{**}$
TPA [0-30 ME/мл]	$17,3 \pm 0,49^*$	$13,27 \pm 0,57^*$	$5,871 \pm 0,26^{**}$

Note: * - differences concerning the data of group II ($P < 0.01$), ** - differences concerning the data of the main group and the control group ($P < 0.05$).

Analysis of the results of the study of gonadotropin levels showed that in all patients with HA, LH concentrations were significantly higher than in the control group. This fact indicates that, regardless of the cause of HA, most patients have signs of impaired gonadotropic, and therefore, ovarian function. The change in the secretion of gonadotropins can be primary as a result of irregularities of circoral secretion of LHRH or secondary - in response to irregularities of ovarian steroidogenesis according to the principles of reverse afferentation. At the same time, in patients with ovarian HA, the biochemical criteria for PCOS were revealed - an increase in the LH / FSH ratio, which was 3.04 ± 0.58 , with adrenal hyperandrogenism, the ratio was 2.19 ± 0.89 . It has been shown that normal levels

of steroid and gonadotropic hormones in the blood do not exclude the diagnosis of PCOS [5]. In all patients with adrenal HA, the levels of testosterone and 17-OH-progesterone were significantly higher than in the group of patients with ovarian HA and the control group ($p>0.05$). According to the diagnostic criterion, Congenital Adrenal Hyperplasia (CAH), among our patients, was detected only in 29 patients (11.33%) of group II.

The results of this stage of the studies carried out, made it possible to confirm the fact of hormonal disorders and to put forward a hypothesis about the possible genesis of HA and to determine the range of necessary hormonal and instrumental studies.

Conclusions

1. Thorough study of anamnestic information: - family history; - age of onset of menarche; - generative history; - the nature of menstrual dysfunction; - the time of occurrence of hirsutism; - the nature of the spread of hirsutism; the height of patients;- according to the ultrasound of the studied women, it will be possible to assume the etiology of hyperandrogenism.

2. LH indicators in all patients with HA were significantly higher than in the control group, while FSH indicators in both groups were normal, but the ratio of the LH/FSH coefficient was 3.04 ± 0.58 in the first group, in the second group 2.19 ± 0.89 ($p=0.07$).

3. Indicators of biochemical markers of hyperandrogenies of free testosterone, DHEA-S and 17-ONP were higher in women with adrenal hyperandrogenism than in the group of patients with ovarian HA compared with the control group ($p>0.05$).

4. To confirm the adrenal genesis of androgens, a test with dexamethasone should be performed.

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