

Predictors of Reproductive Disorders in Adolescent Girls and the Possibility of their Correction

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Abstract

The analytical data presented in the article allow us to draw clinical parallels and identify some patterns in the occurrence of reproductive disorders. Correction of hypoenestrogenemia with topical application of Femistron is pathogenetically justified.

Keywords: *Reproductive Health of Adolescent Girls; Puberty; Physical Development; Heredity; Secondary Sexual Characteristics; Hypoenestrogenemia; Amenorrhea; Hypogonadism; Hypomenstrual Syndrome; Vulvovaginitis*

Introduction

The reproductive health of the modern population of adolescent girls is of particular concern due to the increase in morbidity, both somatic and gynecological [2,4,7]. The negative impact of environmental conditions on the somatic and reproductive health of a teenage girl is currently being considered from the standpoint of new ideas about stress, when pathological changes in the body can be extreme and primarily affect the most integrated indicator of sexual development - menstrual function [1,3,7].

Official statistics show that inflammatory diseases of the genitals (vulvovaginitis) mainly affect girls of preschool age and elementary grades- 36 - 68%, while high school students suffer from various developmental disorders and manifestations of the menstrual cycle (46 - 58%) with a tendency to develop hypomenstrual syndrome and amenorrhea (20%).

In accordance with the foregoing, the restoration of the reproductive health of adolescent girls and, first of all, the normalization of their menstrual function is of particular relevance.

Aim of the Study

The aim of our study was to study the predictors of reproductive system disorders in the modern population of adolescent girls with subsequent correction of the menstrual cycle.

Materials and Methods of Research

To achieve the intended goal, we identified girls with reproductive disorders during preventive examinations (2022) in schools in the city of Tashkent and the Tashkent region (n = 300). Of the total number of examined adolescent girls were selected with impaired sexual

development and dysmenorrhea (n = 120). The mean age was 14.1 ± 1.5 years. An objective assessment of sexual development was carried out according to the common Tanner method, which includes the following elements: the stages of development of the mammary glands (Ma), the stages of development of pubic hair (Pb) and in the armpits (Ax), the age of the onset of the first menstruation (Me). Conducted laboratory and instrumental research methods: Anthropometry, ultrasound examination of the uterus and appendages; x-ray of the skull and Turkish saddle, x-ray of the hands, ELPD - electro-acupuncture diagnostics, EEG - electroencephalography, hormonal studies; if necessary, consultation of related specialists.

Results and Discussion

The frequency of various reproductive disorders among examined adolescent girls (n = 120) was 22.3%. For the purpose of representativeness of the comparative analysis, the surveyed adolescent girls were divided into the following groups:

1. Group 1 consisted of girls with impaired sexual development, but with normal menstrual function (n=40);
2. Group 2 with menstrual irregularities (dysmenorrhea) against the background of normal sexual development (n = 40);
3. Group 3 with menstrual dysfunction (dysmenorrhea) in combination with abnormal sexual development (n = 40).

The control consisted of peers with normal parameters of sexual development and menstrual cycle (n = 20).

So, to clarify the mechanisms of development of these disorders, to determine their functional role in the chronology of the development of disorders of the reproductive system and menstrual function, we analyzed in detail the risk factors for their development.

Analysis of the somatic pathology of the examined patients revealed the following features. The most aggravated was the somatic analysis in patients of the 3rd group, where the pathology of the hepato-biliary complex prevailed n = 39 (78%), in the comparison groups (1 and 2) this pathology occurred in every third patient. Neuro-endocrine diseases occurred in every second patient in all comparable groups. Kidney diseases (chronic pyelonephritis) and CNS pathology in the form of adolescent vegetative-vascular dystonia occurred with approximately the same frequency in group 1 and 2 (24%; 18% and 27%; 21%, respectively), somewhat prevailed in patients of group 3 (38% and 43%). A characteristic feature of extragenital diseases was their double-triple combination in one patient and the anemic background on which they developed, especially in patients of the 3rd group.

Thus, a comparative analysis of somatic pathology in the examined patients showed its greatest aggravation in patients with menstrual dysfunction against the background of impaired sexual development, which indicates the multiplicity of damage to various systems in adolescent girls with reproductive disorders.

In childhood and puberty, all the patients we examined had inflammatory diseases and many childhood infections: measles (66%), infectious parotitis (33%), scarlet fever (27%), whooping cough (18%), rubella (6%). The value of the infectious index in most cases exceeded the average population data, amounting to 8 or more diseases in one patient. It should be noted the high incidence of chronic tonsillitis with annual seasonal exacerbations in childhood and puberty (54% and 56% and 72%, respectively), disorders and the nature of menstruation with menarche and various surgical interventions in this period of life - appendectomy and tonsillectomy.

The study of the hereditary anamnesis of the examined patients revealed the following features. Family history was aggravated in 18% of cases: metabolic and endocrine diseases - 12%: among them thyroid pathology - 9%, obesity - 3%. Among other hereditary diseases, hypertension was noted - 3%, consanguineous marriage - 3%.

By the time of the examination, menstrual irregularities were observed in patients of group 2 and 3 (n = 80). The duration of menstrual irregularities ranged from three months to three years. During this period, 78% of patients did not go to the doctor, 22% of patients re-

ceived treatment that turned out to be ineffective. Comparative characteristics of menstrual dysfunction of the examined patients showed the timely start of a regular cycle (12.5 - 13 years) in patients of the 1st group. The formation of menstrual function in this group of patients took about 6 months (75%), only 1/3 of the patients had a later establishment of the menstrual cycle (25%). Patients with severe menstrual disorders (group 2 and 3) are characterized by a later (21%) menarche against the background of a long menstrual cycle (89%). Patients of the 2nd group are characterized by a high frequency of an unsteady menstrual cycle, accompanied by a pronounced pain syndrome (53% + 29% = 82%). Also, for patients with severe menstrual dysfunction, a tendency to the formation of secondary amenorrhea and oligo-opsomenorrhea is characteristic.

It should be noted that all of the above violations of sexual and physical development in the examined patients of the compared groups proceeded against the background of inflammatory diseases of the pelvic organs: vulvovaginitis - 57% -82% -88%, respectively; adnexitis -27% -66% -33%, respectively.

The delay in physical development in the examined patients manifested itself in the form of violations of mass-growth indicators. An analysis of the parameters of physical development showed more moderate deviations from the average height indicators (3%) in patients of the 1st group compared to those in patients of the 3rd group, where their severity was high (83%).

Thus, a comparative analysis of the clinical manifestations of menstrual dysfunction in adolescent girls against the background of both impaired and normal sexual development showed the greatest burden in patients of group 3, where there was a realization of risk factors in the form of a burdened somatic and hereditary anamnesis [1,3,5]. The combined impact on the unformed body of adolescent girls of the above negative factors affected the development of the reproductive system in the form of pronounced menstrual irregularities (dysmenorrhea). Less harmful to the formation of the reproductive system in adolescent girls, perhaps, was a violation of physical development compared to the premorbid background, on which reproductive disorders developed. Our data are consistent with literature data [2,4,6,7].

Patients of group 2 and 3 with menstrual disorders in the form of primary amenorrhea underwent a study of the hormonal background in dynamics (before and after treatment) with an emphasis on determining the concentration of prolactin and estradiol. In all patients, the levels of gonadotropic hormones before treatment (FSH, LH) were within the age norm (52 ± 0.46 IU/l, 4.9 ± 0.43 IU/l). The concentration of prolactin ranged from 168 to 620 mIU/l, and estradiol - from 90 to 102 pmol/l. These indicators indicated the state of normogonadotropic hypogonadism in patients with menstrual disorders in the form of amenorrhea.

All patients under our supervision received treatment in accordance with gynecological standards, additionally, a local preparation with an estrogen-containing ointment. The rationale for its use was the presence of a mixture of conjugated estrogens of animal origin, which is the main active component of the drug. This mixture of conjugated estrogens is presented in the form of sodium salts capable of dissolving in water, which makes their topical application possible. Being a selective estrogen receptor modulator, the drug has a hormonal effect, replenishing the estrogen deficiency, which we used as an alternative to systemic hormone therapy. The advantage of local exposure over systemic hormonal drugs is its metabolic neutrality, which is especially important with a high incidence of diseases of the gastrointestinal tract and the hepato-biliary complex in the patients we examined.

The drug was administered locally at 0.5g once a day for 3 weeks with a break of 1 week. The duration and frequency of application of an estrogen-containing ointment may vary depending on the clinical dynamics (See below). The drug was used in combination with restorative treatment, the "purity" of the results of its therapeutic efficacy is confirmed by the prospective analysis data below.

Data on the results of using the drug with an estrogen-containing ointment in patients with reproductive disorders are shown in table 1. From the data presented in the table, it can be seen that the therapeutic efficacy of the drug is maximum in patients with isolated repro-

ductive disorders of the inflammatory nature of vulvovaginitis (80.6, 78.6%); in the group with double burden (inflammatory process + violation of the development of the runway according to Tanner 0-1 stage, the effectiveness of treatment is lower (61.3%), but nevertheless higher relative to the previous hormone therapy (40% - rigevidon). Decreased efficacy in the treatment of Femistron in patients 3 groups (hypogonadism, amenorrhea), we leveled its longer prescription (2 - 3 months), which gave normalization of reproductive disorders in 61.3% of cases. The rationale for longer treatment was the absence of complaints and side effects in patients (no nausea, weight, allergies), as well as easy tolerability of the drug.

Treatment	1 st group		2 nd group		3 rd group	
	abs.	%	abs.	%	abs.	%
	33	78,6 ± 6,3	19	61,3 ± 8,7	14	58.1 ± 5.8
Relapse	0	0	0	0	0	0

Table 1: Therapeutic efficacy of treatment with an estrogen-containing ointment in patients with dysmenorrhea.

Comparison of the results of treatment in patients of the compared groups with hypoestrogenic reproductive disorders indicates a similar effect on the state of the reproductive system: a long-term “positive” effect, no relapses.

An echographic study showed a positive trend in the size of the uterus after saturation of the body with local exposure to estrogens in patients of the compared groups. So, before the start of treatment, the echographic parameters of the uterus increased from 38.2+1.6x8+1.3x12.2+2.4 mm and averaged 48.2+2.1x31.3+1.2x44.1+2.4 mm for the groups, ovaries from 9.1 ± 0.3 to 15.4 ± 2.6 mm. The dynamics of the development of the VPP was also positive and amounted to Tanner from stage 0 - 1 to stage 3 - 4 treatment at the end of it. Side effects were not noted. Taking into account the high frequency of multi-systemic disorders that contribute to the development of reproductive disorders in adolescent girls, the complex of therapeutic measures included drugs that improve the functional state of the organs and systems involved in the pathological process: restorative, anti-inflammatory, antianemic and other drugs.

Thus, the analysis of the presented results gives grounds to consider the method of correction proposed by us as acceptable for hormone therapy in patients with hypoestrogenism during puberty.

The regulatory (normalizing) effect on the appearance, rhythm and nature of menstruation when taking the drug also had a positive effect on the psycho-emotional state of the patients, which greatly facilitated psychological contact with them. Attention is drawn to the more rapid onset of the therapeutic effect in patients of group 2 (1 - 2 months), while in patients with double burdens (group 3), treatment proceeded at a slower pace (3 - 4 months).

Monitoring of the effectiveness of treatment was carried out in a complex manner. In particular, synchronization appeared in the development of secondary sexual characteristics, the echographic parameters of the uterus and appendages improved (increased), signs of the inflammatory process of the genitals disappeared, and the hormonal profile returned to normal. Data from the examination of sex hormones are presented in table 2.

It should be noted that the use of our proposed treatment of adolescent girls with reproductive disorders (hypoestrogenemia) ensured success in 84% of cases. In other cases, the effectiveness of treatment was either absent or was short-term, which we attribute to the delicacy of the age of our contingent of patients (unruly attitude to taking medications). Our data show the high efficiency of a modulated treatment regimen for adolescent girls using an estrogen-containing ointment for hypoestrogenemia (amenorrhea, hypogonadism) both in the immediate (1 month) and in the long term (3 - 4 months). Correction of concomitant extragenital and hormonal disorders was, in

Groups	Group 1	Group 2	Group 3
FSG 3.9 ± 0.35	2.7 ± 0.35	2.6 ± 0.36	2.9 ± 0.40
ME/l	2.6 ± 0.37	2.5 ± 0.56	2.8 ± 1.02
Control 2.3 - 3.1 IU/l			
LG 5.1 ± 0.21	3.8 ± 0.21	4.0 ± 0.39	4.0 ± 0.28
ME/l	3.8 ± 0.4	4.1 ± 0.09	4.09 ± 0.7
Control 3.1 - 4.3 ME/l			
E2 297 ± 5.95	175.1 ± 1.4	157.3 ± 17.6	142 ± 10.5
Pm/l	179.0 ± 0.06	161.2 ± 0.15	151.7 ± 0.13
Control 146.7 - 240.9 pm/l			
Tc 1.4 ± 0.19	0.9 ± 0.03	1.1 ± 0.07	1.4 ± 0.07
Nm/l	1.0 ± 0.14	1.0 ± 0.07	1.0 ± 0.05
Control 0.8 - 1.9 nm/l			
Prolactin	175 ± 6.22	347.0 ± 7.14	391.4 ± 9.07
mIU/l			
Control 200 - 400 mIU/l			

Table 2: Indicators of hormones in the blood in examined patients during treatment.
 Note: Numerator - before treatment, denominator - after treatment.

our opinion, an effective measure to prevent the development of reproductive disorders in adulthood, which once again proves the correctness of the chosen scheme for reproductive disorders in adolescent girls.

Conclusion

The results of the comparative analysis allow us to draw the following conclusions:

1. The frequency of reproductive disorders in adolescent girls according to preventive examinations was 22.3%.
2. The structure of the violation of the reproductive system is determined by the age of the girl. In high school students, menstrual cycle disorders (dysmenorrhea) predominate (80%).
3. There is a proportional relationship between the premorbid background and the structure of reproductive disorders in adolescent girls (the more burdened the premorbid background, the more pronounced the menstrual cycle disorders).
4. The premorbid background has priority over physical development in the implementation of reproductive disorders in adolescent girls.
5. Neuro-endocrine diseases (obesity), vulvovaginitis, aggravated heredity and premorbid background are predictors of reproductive disorders in adolescent girls.
6. Correction of hypoestrogenemia (amenorrhea, hypogonadism) using the drug with estrogen-containing ointment is pathogenetically substantiated and highly effective.

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