UDC: 618.17-008.8-053.6: 616.43.45

Characteristic features of puberty in adolescent girls from the Precarpathian region and the main factors of reproductive potential decline

V.B. Dziombak, O.M. Makarchuk
Ivano-Frankivsk National Medical University

Reproductive capacity significantly depends on the period of puberty of a woman-to-be, as well as on the so-called «intrauterine childhood».

to determine the peculiarities of the development of a girl during her puberty, to evaluate the causes of the menstrual function disturbances and to identify the main factors of the reproductive potential decline.

The medical and social audit was conducted by interviewing, questioning and studying the medical documentation (clinical symptoms of extragenital pathology, duration of the disease, state of menstrual function, heredity, lifestyle and bad habits) in 264 girls in order to evaluate the probable factors of the development of menstrual function disturbance and ovarian-menstrual cycle disorders.

The period of «intrauterine childhood» was in the context of a complicated gestation period: the threat of abortion, preeclampsia of varying degrees of severity, perinatal infections, preterm labour, fetal hypotrophy, harmful parenting habits, fetal distress during childbirth. More than two thirds of girls have chronic diseases of the internal organs, 24,2% of patients have the comorbidity of gynaecological pathology and extragenital diseases. Menstrual disorders predominate by type of algodismenorrhea, premenstrual syndrome and juvenile uterine bleeding. In sexually active adolescents the inflammatory processes of the genitals have been revealed in 46,2% of cases, undoubtedly the number of girls with absolute or relative risk of infertility is increasing. Dyshormonal diseases of the mammary glands were noted in 16,7% of cases, in girls with gynaecological pathology – twice as often, and in patients with menstrual function disturbances – 53,4%. The comparative analysis indicated the most obvious negative effect on the reproductive capacity, ovarian reserve of ovarian operations and hereditary predisposition to the disturbed reproductive function (OR=19,3; 95%: 3,1–92,6).

The obtained results help in classifying the risk factors of reduced reproductive potential for female adolescents and girls, which allows to optimize the formation of risk groups, to predict and monitor the reduction of the ovarian reserve and to develop preventive measures for improvement of the reproductive capacity. The most significant causes that reduce the reproductive potential of girls in the period of «intrauterine childhood» are: complicated pregnancy (severe gestosis, complicated childbirth), maternal perinatal infections (especially in the early stages), and in the adolescence – ovarian surgery, childhood infections, hypothyroidism and bad habits (smoking).

puberty, main causes of menstrual disturbances, reproductive potential.

It should be noted that nowadays morphological and functional changes in the basic systems of the body and the restructuring of the regulatory mechanisms in adolescent girls are connected with a number of social burdens, among which: changes in the assessment of the quality of school education (independent assessment, etc.), the necessity for professional self-determination, early career, change in lifestyle and behaviour, integration in an adult society. Strong growth, increased movement and neuropsychiatric activity of modern youth lead to significant stress in the autonomic nervous system, all endocrine glands and all parts of the metabolism. Factors mentioned above and a number of adverse external influences in puberty age often cause the development of vegetative dystonia, lability of the psyche and psycho-emotional state, the expressed instability of some aspects of the neuropsychic state [5, 7, 8].

Changes in the social sphere, as well as negative environmental impacts, led to the formation of two polar groups, based on the course of puberty of teenage girls: on the one hand, with a pronounced tendency to early puberty and sexual socialization; on the other hand – teenagers with a delay in sexual and psychosexual development. Along with that, the number of children with normal course of puberty development in the population is decreased [5]. It should also be mentioned that nowadays puberty period begins earlier than years ago. Thus, the age of menarche in Central Europe and in the United States during the last 100 years is reduced by 2–3 months every decade, due to the stability of socio-economic conditions, an increase in the quality of life and general health of the population [5, 8].

Basing on literature reports, it is known that for modern teenage girls the trophic syndrome with disharmonious physical development, decrease of functional reserves against the background of delayed sexual development is typical. According to many authors, in the modern population of schoolgirls the percentage of girls lagging behind the biological age from the calendar one – increases. So, among 14-year-old teens there are 32% of such girls, among the 16-year-olds – 25%, among the 18-year-olds – 22%. There are also numerous studies indicating that up to the age of 14–17, when the formation of a girl as a mother-to-be is finished and adolescents enter the reproductive period of life, almost every tenth girl has a disharmonious development, every fourth one has the disturbance of the skeleton formation, 14% of girls have arterial hypertension. And changes in the health status in more than 30% of girls allow them to be attributed to the third group of health (chronic diseases) [1–3, 6].

Reproductive capacity significantly depends on the period of puberty development of a woman-to-be, as well as on the so-called «intrauterine childhood». It has been proven by many scientists that pathologic processes of the maternal gestational period have a great influence on the formation of genital organs and their functional capacity, but perinatal factors, for objective reasons, are usually evaluated retrospectively, without documentary and laboratory evidence, which undoubtedly reduces their practical value for the timeous prevention of possible disturbances in the reproductive sphere. A number of recent publications have shown that in severe forms of infertility, placental insufficiency, infectious processes of the genital tract, delayed fetal development and due to maternal harmful habits, the inhi-

bition of maturation of the gonads and the development of hypoplasia of the ovaries with a decrease in the number of follicles are observed [1–4, 6].

To substantiate the reproductive behaviour and the possibility of timely implementation of the reproductive function, it is important to determine the predictors of a probable low reproductive potential by establishing the significance of damaging factors from the period of «intrauterine childhood» in adolescent girls and girls.

was to determine the peculiarities of the development of a girl during her puberty, to evaluate the causes of the menstrual function disturbances and to identify the main factors of the reproductive potential decline.

PATIENTS AND METHODS

The medical and social audit was conducted by interviewing, questioning and studying the medical documentation (clinical symptoms of extragenital pathology, duration of the disease, state of menstrual function, heredity, lifestyle and bad habits) in order to evaluate the probable factors of the development of menstrual function disturbance and ovarian-menstrual cycle (OMC) disorders. To solve the task we have examined 264 girls. An assessment of their questionnaires and medical records, a profound study of social factors, the age of the first sexual debut, the onset of menarche, somatic and gynaecological pathology have been performed. According to the results of the study we have made the patients' examination card, the assessment of the period of "intrauterine childhood" was carried out on the basis of the study of medical documentation; in order to identify the peculiarities of mother's pregnancy we used the antenatal record (form 111/u) or interview with parents. In the puberty period the estimation of probable damaging factors was carried out according to the out-patient card (form N 025/u-04), and by the method of questioning.

Based on the interview schedule, the obtained results were statistically analyzed and an analysis of the antenatal, prepubertal and pubertal periods of girls under the age of 18, who were monitored at the family planning center of the regional perinatal center in Ivano-Frankivsk, was performed.

RESULTS OF THE STUDY AND THEIR DISCUSSION

The research retrospectively revealed from the medical records a complicated pregnancy in mothers in more than half of the observations (67.8%), which is a premorbid background for the malformation of the genitalia and the sexual sphere of the girls. Disturbances of vascular tone in the fetoplacental complex enhance ischemic processes and may be a predictor of premature decline in ovarian reserve [2]. The period of "intrauterine childhood" was in the context of a complicated gestation: the threat of abortion (47.8%), preeclampsia of varying degrees of severity (46.2%), perinatal infections (27.6%), preterm labour (17.8%), fetal hypotrophy (31.0%), bad parenting habits (29.9%), fetal distress in childbirth (21.9%). The most significant were placental dysfunction, fetal distress and preeclampsia (especially severe) – (OR=14.6; 95%: 1.39–19.2). In 38.3% cases we observed the maternal heredity concerning the reproductive function abnormality.

The profound analysis of correlation between the harmony of physical development and comprehensive assessment of health according to the studied medical documentation showed that in 53.8% of cases dysharmonic physical development of girls was noted, which is connected with adverse health conditions, and is an unfavourable prognostic sign of probable deterioration of reproductive health. More than two thirds (72.3%) of girls have chronic diseases of the internal organs, in 24.2% the comorbidity of gynaecological pathologies and extragenital diseases were revealed.

In the structure of gynaecological diseases, menstrual disturbances are met in 52.6% of cases, alggiosomenorrhea – in 29.2%, premenstrual syndrome – in 54.2%, juvenile uterine bleeding – in 38.6%, mainly in girls aged 15-18 years old. Among widespread pathologies are hypomenstrual syndrome (23.5%) and secondary amenorrhea (15.9%) in combination with hyperandrogenism (40.9%) and metabolic disorders (31.1%). Such high frequency of menstrual dysfunctions is due to the fact that during the first two years after menarche from 55 to 90% of cycles (according to various authors) are unovulatory, by 5 years after menarche such cycles make up about 20%, that is, mechanisms of ovulation in ovaries of adolescent girls remain unstable and immature [7, 8].

In 59.9% of cases the diseases that have a negative effect on the reproductive function were noted, 28.7% of girls had a rubella and epidemic parotitis in their case histories. In addition to childhood infections that affect the reproductive potential of girls, much attention is paid to somatic pathology, especially in the structure of endocrine disorders. It is well-known that extragenital pathology in adolescents affects the state of reproductive potential. The analysis of the state of somatic health revealed 3 patients (1.1%) with type 1 diabetes, a significant number of respiratory diseases (29.9%), hypothyroidism (10.9%), vegetative-vascular dystonia (19.38%), the diseases of the urinary system and the gastrointestinal tract were met with the same frequency. In the puberty period, infectious diseases such as rubella (54.1%), parotitis (32.9%) happened more frequently. Most girls with disturbances of the menstrual function belonged to the dispensary group as «frequently and chronically ill children». It should be noted that 20.5% of adolescent girls smoke. It turned out that 65.5% of teenage girls have different chronic somatic diseases; every adolescent under the age of 14 years has on average 2–3 chronic diseases, and at the age of 15–18 years – more than 3 diseases. The assessment of the body mass index (BMI) made it possible to note the low BMI in 17.5% of cases.

Among the most aggressive factors during the reproductive function development which determine reproductive potential and ovarian reserve are surgery on the pelvic organs and ovaries. The comparative analysis showed that the most negative effects on the reproductive capacity and ovarian reserve and the highest possible risk of having menstrual disorders had ovarian surgery and hereditary predisposition for a disturbed reproductive function, which increased the risk by 19.3 times (OR=19.3; 95%: 3.1–92.6).

The trigger of changes, including autoimmunos ones, in the ovaries may be inflammatory diseases of the pelvic organs. The scientific data indicate that 22.3% of women with chronic salpingo-oophoritis developed ovarian insufficiency with the presence of circulating and fixed anti-ovarian antibodies as markers of autoimmune hypofunction of the ovaries [1]. Disturbance of hormonal homeostasis, which is manifested in enhanced estrogenic stimulation on the background of relative or absolute hypoprogesteroneemia, leads to hyperplasia of the epithelium, changes in the processes of differentiation and rejection of endo-exocervix surface cells [1–4]. In the last 10 years there has been noticed a steady increase in the frequency of pathological condition of the cervix due to the deterioration of the general health of adolescent girls, changes in social behaviour of young people, and the increase in gynaecological morbidity in this age category. Undoubtedly, in addition to exogenous aspects (infectious-inflammatory factors, papilloma virus infection, sexual behaviour), the great influence on the development of pathological conditions of the cervix has the state of the endocrine profile of the body [5, 6]. Inflammatory diseases: nonspecific vaginitis (17.8%), candidiasis vaginitis (10,9%), ectopia of the cervix (12.1%). The study revealed that sexually active girls had genital inflammatory processes in 46.2% of cases, while their peers who had no sexual experience – 12.5%, which undoubtedly increases the proportion of girls with an absolute or relative risk of infertility.

It should also be noted that the mammary gland is primarily a target for steroid hormones of the ovaries and also undergoes pro-

nounced changes depending on changes in levels of gonadotropic and sex hormones in the puberty period. Dyshormonal diseases of the mammary gland in adolescent girls were noted in 16.7%, if there are any gynaecological pathology – twice as often and in case of disorders of menstrual function the frequency of mastopathy is 53.4%.

Thus, almost all diseases that in future can affect conception and pregnancy, cause menstrual cycle disorder. Of course, it is not always possible to prevent a reduction in reproductive potential, but awareness of the factors contributing to its damage allows forming risk groups even before the clinical stage. The formation of prognostic criteria will allow to estimate the possibility of reproduction taking into account the existing ovarian reserve, to plan the reproductive behaviour of a girl, to prevent or rehabilitate a possible pathology that contributes to reducing the reproductive reserve.

CONCLUSIONS

The obtained results help in classifying the risk factors of reduced reproductive potential for female adolescents and girls, which allows to optimize the formation of risk groups, to predict and monitor the reduction of the ovarian reserve and to develop preventive measures for improvement of the reproductive capacity. The most significant causes that reduce the reproductive potential of girls in the period of «intrauterine childhood» are the complicated pregnancy (severe gestosis, complicated childbirth), maternal perinatal infections (especially in the early stages), and in the adolescence – ovarian surgery, childhood infections, hypothyroidism and bad habits (smoking). Further study of probable factors that imply the reproductive function of women is rather advanced.

Характеристика течения пубертантного периода у девочек-подростков Прикарпатского региона и основные факторы снижения репродуктивного потенциала

В.Б. Дзьомбак, О.М, Макарчук

Репродуктивные возможности в значительной степени зависят от течения пубертатного развития будущей женщины, а также периода «внутриутробного детства».

установление особенностей развития девочки в пубертатный период, оценка причин нарушения становления менструальной функции и выделение основных факторов снижения репродуктивного потенциала.

Проведен медико-социальный аудит методом интервьюирования, анкетирования и изучения медицинской документации (клинические симптомы экстрагенитальной патологии, длительность заболевания, состояние менструальной функции, способ жизни и вредные привычки) 264 девочек для оценки возможных факторов развития нарушения становления менструальной функции и расстройств овариально-менструального цикла.

Период «внутриутробного детства» проходил в условиях осложненного гестационного процесса: угроза прерывания беременности, преэклампсия разной степени тяжести, перинатальные инфекции, преждевременные роды, гипотрофия плода, дистресс плода в родах, вредные привычки родителей. Более двух третей девочек имеют хронические заболевания внутренних органов, у 24,2% – установлена коморбидность гинекологической патологии и экстрагенитальных заболеваний. В структуре гинекологических заболеваний превалируют нарушения менструального цикла по типу альгодисменореи, предменструального синдрома, ювенильных кровотечений. У сексуально активных подростков воспалительные процессы половых органов выявлены в 46,2% случаев, что, без сомнения, увеличивает долю девочек абсолютного или относительного риска развития бесплодия. Дисгормональные заболевания грудной железы отмечено у 16,7%, при наличии гинекологической патологии – в два раза чаще, а при нарушении становления и расстройствах менструальной функции – у 53,4%. Сравнительный анализ продемонстрировал наиболее негативное влияние оперативных вмешательств и наследственной предрасположенности на состояние репродуктивного потенциала и овариального резерва и снижение репродуктивной функции (OR=19,3; 95%: 3,1–92,6).

Полученные результаты дают возможность классифицировать факторы риска снижения репродуктивного потенциала для девочек-подростков и девушек, что позволяет оптимизировать формирование групп риска, прогнозировать и мониторировать снижение овариального резерва и разрабатывать профилактические меры для улучшения репродуктивного потенциала. Наиболее значимыми факторами, влияющими на репродуктивный потенциал девочек, в период «внутриутробного детства» были осложненное течение беременности (тяжелые гестозы, осложненные роды) и перинатальные инфекции в ранних сроках у матери, а в пубертатный период – оперативные вмешательства на яичниках, детские инфекционные заболевания, гипотиреоз и вредные привычки (курение).

пубертатный период, основные факторы нарушения менструальной функции, репродуктивный потенциал.

Характеристика перебігу пубертатного періоду у дівчаток-підлітків Прикарпатського регіону та основні чинники зниження репродуктивного потенціалу

В.Б. Дзьомбак, О.М. Макарчук

Репродуктивні можливості суттєво залежать від того, як перебігав період пубертатного розвитку майбутньої жінки, а також так званого внутрішньоутробного дитинства.

встановлення особливостей розвитку дівчинки у пубертатний період, оцінювання причин порушення становлення менструальної функції та виділення основних чинників зниження репродуктивного потенціалу.

Проведено медико-соціальний аудит шляхом інтерв'ю, анкетування та вивчення медичної документації (клінічні симптоми екстрагенітальної патології, тривалість захворювання, стан менструальної функції, спадковість, спосіб життя та шкідливі звички) 264 дівчаток для оцінювання імовірних чинників розвитку порушення становлення менструальної функції та розладів овариально-менструального циклу.

Період «внутрішньоутробного дитинства» перебігав в умовах ускладненого гестаційного періоду: загроза переривання вагітності, прееклампсія різного ступеня тяжкості, перинатальні інфекції, передчасні пологи, гіпотрофія плода, шкідливі звички батьків, дистрес плода у пологах. Більше двох третин дівчат мають хронічні захворювання внутрішніх органів, у 24,2% – виявлена коморбідність гінекологічної патології та екстрагенітальних захворювань. У структурі гінекологічних захворювань переважають порушення менструального циклу за типом альгодисменореї, передменструального синдрому та ювенільних маткових кровотеч. У сексуально активних підлітків запальні процеси статевих органів виявлено у 46,2% випадків, що, без сумніву, збільшує частку дівчат абсолютного або відносного ризику розвитку безплідності. Дисгормональні захворювання грудної залози відзначено у 16,7%, за наявності гінекологічної патології – у два рази частіше, а при порушенні становлення та розладах менструальної функції – у 53,4%. Порівняльний аналіз продемонстрував найбільш виражений негативний вплив на стан репродуктивного потенціалу та овариального резерву оперативних втручань на яєчниках та спадкової схильності щодо порушень репродуктивної функції (OR=19,3; 95%: 3,1–92,6).

Отримані результати дають можливість класифікувати фактори ризику зниження репродуктивного потенціалу для дівчаток-підлітків та дівчат, що дозволяє оптимізувати формування груп ризику, прогнозувати та моніторувати зниження овариального резерву та розробляти профілактичні заходи для покращення репродуктивного потенціалу. Найбільш значущими факторами, що знижують репродуктивний потенціал у дівчат у період «внутрішньоутробного дитинства», були ускладнений перебіг вагітності (тяжкі гестози, ускладнені пологи) та перинатальні інфекції у матері, особливо перенесені на ранніх термінах, а у підлітковий період – оперативні втручання на яєчниках, дитячі інфекційні захворювання, гіпотиреоз та шкідливі звички (куріння).

пубертатний період, провідні чинники порушення менструальної функції, репродуктивний потенціал.

Сведения об авторах

Макарчук Оксана Михайловна – Кафедра акушерства и гинекологии ННИ ПО ГВУЗ «Ивано-Франковский национальный медицинский университет», 76000, г. Ивано-Франковск, ул. Галицкая, 2

Дзембак Владимир Богданович – Кафедра акушерства и гинекологии имени И.Д. Ланового ГВУЗ «Ивано-Франковский национальный медицинский университет», 76000, г. Ивано-Франковск, ул. Галицкая, 2; тел.: (050) 521-01-92. *E-mail: O_makarchuk@ukr.net*

REFERENCES

1. Andreyeva V.O., Gerasimova I.A., Mashtalova A.A. (2013). Sostoyaniye ovarial'nogo rezerva u devochek-podrostkov s autoimmunnym ooforitom [State of ovarian reserve in adolescent girls with autoimmune oophoritis]. Reproduktivnoye zdorov'ye detey i podrostkov, 1, 35–43 (in Russian).

2. Aronskind A.V., Kovtun O.P., Kabdrakhmanova O.T. (2010). Sravnitel'nyye rezul'taty katamnesticheskogo nablyudeniya detey, perenesshikh kriticheskiye sostoyaniya neonatal'nogo perioda [Comparative results of follow-up observation of children who underwent critical states of the neonatal period]. Pediatriya, 89(5), 47–50 (in Russian).

3. Burlakina N.A., Uvarova Ye.V. (2009). Vliyaniye somaticheskoy patologii na nekotoryye parametry fizicheskogo razvitiya devochek v vozraste 10–14 let [The influence of somatic pathology on some parameters of the physical development of girls aged 10–14 years]. Reproduktivnoye zdorov'ye detey i podrostkov, 4, 78–84 (in Russian).

4. Parashchuk Yu.S., Tuchkina I.A. (2005). Negormonal'noye lecheniye devochek-podrostkov s patologiyey pubertatnogo perioda v komplekse etapnoy reabilitatsii [Non-hormonal treatment of adolescent girls with pathology of the pubertal period in the complex of stage rehabilitation]. Eksperymental'na i klinichna medytsyna, 2, 144–147 (in Russian).

5. Radzinskiy V.Ye., Khamoshina M.B., Lebedeva M.G. (2010). Devushki-podrostki: sovremennyye tendentsii formirovaniya reproduktivnogo potentsiala (obzor literatury) [Adolescent girls: current trends in the formation of reproductive potential (review of literature)]. Sib. med. zhurn., 25(4–2), 9–14 (in Russian).

6. Tsysar Yu.V., Andriyets' O.A. (2011). Vplyv patolohiyi shchytopodibnoyi zalozy na menstrual'nu funktsiyu u divchat pubertatnoho viku [Influence of the thyroid gland pathology on menstrual function in girls of puberty age]. Bukovyns'kyy medychnyy visnyk, 15 (2,58), 130–132 (in Ukrainian).

7. Yakovlyeva E.B., Serhiyenko M.Yu., Kas'yanova N.V., Loskutova O.V. (2011). Suchasni pohlyady na problemu pubertatnoho periodu [Modern approach to the problem of puberty period]. Novosti meditsiny i farmatsii. Akusherstvo, ginekologiya, reproduktologiya, 369, 3–4 (in Ukrainian).

8. Agarwal A., Verma A., Agarwal S. (2014). Antral follicle count in normal (fertility-proven) and infertile Indian women. Indian J. Radiol. Imaging, 24(3), 297–302.

Статья поступила в редакцию 31.07.17