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Clinical and Echographic Characteristics of the Uterus, Ovaries and Endometrium in Healthy Girls and in Girls with Juvenile Uterine Bleeding

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Abstract Objective: To study the in-depth functional features of the structural features of the size of the ovaries, uterus, and endometrium in healthy girls and in girls with JUB from the age of 12 to 16 years. We conducted a study in 32 healthy girls and in 36 girls with juvenile uterine bleeding aged 12 to 16 years. Anthropometry of the uterus and ovaries was performed in girls of both groups. An ultrasound of the genital organs was performed on a Sonomed, Spectromed 400 apparatus, Acer, Russia, 2005. with linear sensors 200 W, 220 V, 50 Hz. As noted above, the thickness of the endometrium in healthy girls is characterized by growth in the second phase of the cycle. In girls with juvenile uterine bleeding (JUB), a significant increase in the thickness of the endometrium is even more intensified, which indicates atresia of the follicle and, accordingly, a prolonged estrogenic effect on the growth of the endometrium.

Keywords Juvenile uterine bleeding, Endometrium, Uterus and ovaries, Ultrasound

1. Introduction

Juvenile uterine bleeding in the structure of gynecological diseases in girls is 16.6% - 48.1%, relapses up to 19.3% [2,4,5,6,7,9,10,12,15,17]. In recent decades, in gynecology, ultrasound research has gained particular importance both in normal physical and sexual development, and in reproductive disorders. The first report on the successful use of ultrasound in children and adolescents to determine the status of the internal genital organs, both normal and in pathology, belongs to M. Gates (1978). Using ultrasound, it is possible to trace the growth and development of the uterus and ovaries in girls from the time of onset menarche to 18 years. The method is painless and safe for patients, which allows multiple observations in dynamics. Safety and high resolution of the method indicate great potentialities of using ultrasound in pediatric gynecology [1,2,3,6,13,15,17]. The literature contains detailed data on the echographic anatomy of the internal genital organs in early childhood and at different periods of puberty [8,11,18]. The ability to obtain complete and reliable information about the condition of the pelvic organs in adolescents with the help of ultrasound made it possible not to use such complex, invasive and expensive research methods as laparoscopy and hysteroscopy [14,16,19].

Objective: To study the in-depth functional features of the structural features of the size of the ovaries, uterus, and endometrium in healthy girls and in girls with juvenile uterine bleeding from the age of 12 to 16 years.

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2. Material and Methods

We conducted a study in 32 healthy girls and in 36 girls with juvenile uterine bleeding aged 12 to 16 years. Anthropometry of the uterus and ovaries was performed in girls of both groups.

An ultrasound of the genital organs was performed on a Sonomed, Spectromed 400 apparatus, Acer, Russia, 2005. with linear sensors 200 W, 220 V, 50 Hz.

Studies have shown the absence of a significant significant difference in the size of the left and right ovary, in connection with which they presented generalized data. The results of ultrasound are presented in table 1.

As can be seen from the data table, in girls aged 12 years in the first phase, the length of the ovary is 2.4 ± 0.17 cm, width 1.5 ± 0.08 cm. In the second phase of the menstrual cycle, the size of the ovary does not differ significantly: resp. 2.5 ± 0.2 and 1.6 ± 0.07 cm ($P > 0.05$). Further, in girls aged 13 years, the size of the ovaries significantly increases: in the first phase, respectively. 3.5 ± 0.23 and 2.5 ± 0.13 cm ($P < 0.05$), in the second resp. 3.6 ± 0.2 and 3.0 ± 0.21 cm ($P < 0.05$). Approximately the same results were obtained for girls aged 14, 15 and 16 years. In girls aged 14 years, in the first phase, the length of the ovary is 3.4 ± 0.26 cm, width 2.4 ± 0.18 cm. In the second phase of the cycle, these indicators

increase markedly: resp. 3.6 ± 0.27 and 3.5 ± 0.2 cm (P <0.01). At age 15: in phase I resp. 3.3 ± 0.21 and 2.6 ± 0.23 cm, in II resp. 3.8 ± 0.19 and 3.2 ± 0.28 cm (P <0.05). At 16: in phase I resp. 3.8 ± 0.3 and 2.4 ± 0.18 cm, in II resp. 3.8 ± 0.24 and 2.6 ± 0.17 cm (P <0.01).

In girls with juvenile uterine bleeding, ovarian size tends to decrease, but the pattern of growth of this organ, depending on age, generally remains. So, in girls with juvenile uterine bleeding at the age of 12, in the first phase of the menstrual cycle, the length of the ovary is 2.2 ± 0.17 cm, width 1.6 ± 0.08 cm. In the second phase: resp. 2.3 ± 0.19 and 1.5 ± 0.09 cm (P >0.05). At the age of 13 years in the first phase of the cycle, respectively. 2.8 ± 0.2 and 2.2 ± 0.15 cm, in the second resp. 3.1 ± 0.23 and 2.8 ± 0.17 cm. Further, despite the significant growth of the ovaries at the age of 14, 15 and 16 years, it still remains significantly reduced in comparison with the same indices of healthy girls. In girls with juvenile uterine bleeding at the age of 14, in the first phase of the menstrual cycle, the length of the ovary is 2.9 ± 0.24 cm, the width is 2.4 ± 0.2 cm, in II, respectively. 3.0 ± 0.22 and 3.6 ± 0.28 cm. At the age of 15 years: in phase I, respectively. 3.0 ± 0.19 and 2.7 ± 0.23 cm, in II resp. 3.4 ± 0.15 and 3.6 ± 0.3 cm. At the age of 16 years: in the first phase 3.2 ± 0.27 and 2.5 ± 0.18 cm, in the second 3.6 ± 0, 29 and 3.8 ± 0.25 cm (P <0.05-0.01).

During ultrasound examination, the most informative size of the uterus is the length of the uterus, on the basis of which other sizes are determined and, accordingly, one or another pathology of the uterus is detected. In the groups we studied, no significant difference was found depending on the phase of the ovarian cycle (P >0.05). In girls with ymk, the length of the uterus is characterized by a certain reduced size in General, compared with the indicators of healthy girls (P <0.05). However, the growth pattern of this size does not change depending on age (P <0.05).

Interesting results were obtained in the analysis of endometrial data in the examined patients. The thickness of the endometrium in healthy girls is characterized by growth in the second phase of the cycle. Thus, in healthy girls aged 12 years in the first phase of the menstrual cycle, the thickness of the endometrium was 0.9 ± 0.25 cm, in the second 1.1 ± 0.09 cm. In girls aged 13 years: correspond. 0,8 ± 0,07 and 1,2 ± 0,1 cm (P <0,05). The same pattern persists in healthy girls aged 14, 15 and 16. For girls aged 14 years: 0.9 ± 0.06 and 1.2 ± 0.07 cm, at 15 years 1.0±0.09 and 1.4 ± 0.1 cm, at 16 years 1.1 ± 0.1 and 1.5 ± 0.12 cm (P <0.05).

In girls with juvenile uterine bleeding, a significant increase in the thickness of the endometrium is observed precisely in the second phase of the cycle, which probably indicates follicular atresia. So, in girls with juvenile uterine bleeding at the age of 12 years, the thickness endometrium in the first phase of the menstrual cycle is 0.8 ± 0.08 cm, in the second 1.2 ± 0.1 cm (P <0.05). Endometrial hyperplasia progresses in older girls. In girls aged 13 years, the thickness of the endometrium is: 0.7 ± 0.09 in the first and 1.5 ± 0.16 cm in the second phase of the menstrual cycle (P <0.01). At age 14, respectively. 0.7 ± 0.05 and 1.6 ± 0.09 cm, at 15 years of age 1.4 ± 0.09 and 1.6 ± 0.12 cm, 16 years of age 1.0 ± 0.15 and 1.8 ± 0.17 cm (P <0.05-0.001).

Thus, the results of ultrasound revealed regular changes characteristic of both healthy and girls with juvenile uterine bleeding. Active ovarian growth has been observed since 13 years. The size of the ovaries as a whole tends to increase in the second phase of the cycle, which was especially pronounced in healthy girls aged 13, 14 and 15 years. An increase in the total volume of the ovaries and the absence of ovulation at this age indicates an anovulatory type of the menstrual cycle. In contrast, girls aged 16 years have relatively the same sizes in both phases of the menstrual cycle, indicating the presence of an ovulatory cycle. Unlike healthy girls, anovulatory type of the menstrual cycle is observed in girls with juvenile uterine bleeding in all age groups (P <0.05-0.001).

3. Conclusions

The highest growth of the uterus is observed from the age of 13, while there is no significant difference in performance depending on the phase of the cycle (P >0.05). Keeping the same pattern, girls with juvenile uterine bleeding show a slight decrease in the size of the uterus, however, these data were not reliable (P >0.05), except for the age category of 16 years (P <0.05).

As noted above, the thickness of the endometrium in healthy girls is characterized by growth in the second phase of the cycle. In girls with juvenile uterine bleeding, a significant increase in the thickness of the endometrium is even more intensified, which indicates atresia of the follicle and, accordingly, a prolonged estrogenic effect on the growth of the endometrium.

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