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Analysis of risk factors of different forms of infertility in women of reproductive age

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Abstract
Infertility is not only a medical pathology, but a social phenomenon as well that affects not only the demographics but, often causes the family problems, psychological discomfort and decreases social activity of couples. Primary and secondary infertility are 47% and 52% respectively. The main factors that contribute to the development of secondary female infertility include inflammation after abortion (62%), surgical and gynecological surgery (33.4%), abnormal births (4.6%). Tubal-peritoneal infertility is often associated with PCOS (43.3%), endometriosis (23.7%), uterine cancer (24.4%), abnormalities of the genital organs (4.4%). Studying the range of viral and bacterial factors that induce infertility of couples points to the significant role of chlamydial infection. In Europe primary infertility (69-73%) dominates due to a low share of abortions and sexually transmitted infections (STI), high socio-economic level and a qualified medical service. Factors that contribute to the development of STI are low level of education and culture, social causes, early sexual activity, frequent change of sexual partners.
Among the primary causes of infertility the hypothalamic-pituitary-ovarian failure dominates and all the related ovulatory changes that frequently develop into problems with menstrual cycle. The cervical pathology (cervical factor) as the cause of infertility is confirmed by various researchers. The frequency of cervical factor infertility reaches 20%. Uterine and cervical factors occur in 5-17% of cases. They are associated with intrauterine interventions; abnormal childbirth and abortion, complicated infections; traumatic lesions of the uterus and cervix. Cervical factor includes the presence of anti-sperm antibodies in cervical mucus, changes in cervical mucus properties when hormonally imbalanced, anatomic changes in the cervix, exo- and endocervical inflammation. Uterine form of infertility is mainly related to the occurrence of intrauterine synechiae and abnormalities of the uterus. Uterine factor is more common in countries with a high percentage of female genital infections, infectious complications after delivery and intrauterine interventions. Recently, more attention is given to immune factors of infertility, the determination of anti-sperm antibodies in cervical mucus, blood, peritoneal and follicular fluids. The frequency of immune factor is 2-5%. Infertility is observed when there are uterine fibroids, ovarian tumors, congenital anomalies of the female genital organs. The combination of uterine fibroids with tubal-peritoneal factor, external genital endometriosis, PCOS, ovarian tumors is observed in 40-60% of patients with infertility.

Keywords: Infertility, risk factors, gynaecological pathology.

1. Introduction
One of the important indicators of reproductive health is infertility. Today 10-15 percent of Ukrainian families are suffering from infertility, which can be related to direct reproductive losses. The number of infertile couples reaches about 1 million. According to scientific data, almost 80 percent of cases of infertility in women is abortion, 15-25%- inflammation of the reproductive organs. The frequency of infertile marriage varies within 12-30%, but this tendency is not decreasing. Today about 100 million couples in the world are barren and every year this amount increases by 10 million of new infertile couples. Such a marriage affects the demographics data. It is not only medical and biological, but also an important social problem. In general, the current situation is characterized by a sharp decline in birth rates, high total mortality of the population (especially among men of capable age), as a result the positive population growth is not provided and the quality of life is getting worse. According to various sources, the most common cause of infertility is inflammatory diseases of the genitals and hormonal disorders. The incidence of inflammatory diseases for the years of 2012-2014 amounted to 7.5 and 7.0 per 1,000 women of reproductive age, and the hormonal disturbances is increased from 9.8 to 10.6.

2. Methods and materials: The materials for the study were 120 women with infertility of different genesis in the history among which

- Subgroup 1.1 - 30 women with tubal infertility origins;
- Subgroup 1.2 - 30 women with infertility of endocrine origin;
- Subgroup 1.3 - 30 women with infertility of combined origin who became pregnant without assisted reproductive technologies (ART);
- Subgroup 1.4 - 30 women with infertility of combined origin who became pregnant using ART.

Results and discussion. Analyzing the characteristics of menstrual functions we drew attention to the fact that the menarche occurs later (p <0.05 and p <0.01) in patients with endocrine and combined infertility (Table. 1).

Table 1: Age of menarche by subgroups (%)

Indicator	Subgroups of patients		
	Tubal infertility n=30	endocrine infertility n=30	Infertility of combined genesis n=60
11-12 years	20,0±2,2	20,0±2,0	16,7±1,9
13-14 years	73,3±7,2	70,0±6,8	70,0±6,4
15 and older	6,7±0,5	10,0±1,2*	13,3±1,2**

Reliability relatively to subgroup with tubal infertility
* P <0.05; ** P <0.01

In patients with endocrine and combined infertility the cycle was often set in 6 (p <0.05) and 12 months (p <0.01), and the cycle was not set (p <0.05 and p <0.01). Considering the age of sexual debut in groups of patients it should be noted that women with infertility of various origins in history began the sexual life before they were15 years old (p <0.05) and often after they were 20 years old (p <0.05). The data of reproductive history are of particular interest. Patients with endocrine and combined infertility had the first pregnancy rarely**,** and they had more often spontaneous abortions and pregnancy that was not developing.

Analyzing the primary genital pathology it was indicated that among the women with the infertility of various origins in history frequent inflammation (p <0.001); cervical pathology (p <0.01) and menstrual dysfunction (p <0.001) occurred more frequently. PCOS, ovarian cysts were met in history only in patients with endocrine forms of infertility. In comparative perspective, we observed a higher frequency of inflammation of the reproductive system in the presence of tubal infertility (p <0.05 and p <0.001). The incidence of cervical lesions in subgroups did not differ significantly (p> 0.05). The rate of menstrual function disorder and pathology of the ovaries was significantly higher (p <0.001) in the presence of combined endocrine and infertility.

The duration of infertility in group 1 was 4,3±0,4 years, and 2-4,5±0,5 years (p> 0.05). Depending on the genesis of infertility, this figure is also not significantly different (4,1±0,4 years; 4,4±0,4 years and 4,7±0,5 years respectively; p> 0.05).

Infertility treatment of various origins was conducted under existing protocols of Ministry of Health of Ukraine. Taking into account the obstetric and perinatal focus of the doctoral thesis, we considered it appropriate to conduct a detailed analysis of the treatment except the fact that for 60 out of 120 patients with the combined genesis of infertility the ART were used under the conditions existing in the present protocols.

According to the data all the options of concomitant somatic disease occurred more often in patients of major groups with the predominance of cardiovascular disease (p <0.01) and disease of the gastrointestinal tract (p <0.01). For subgroups it should be indicated the significant differences in the subgroup of women with tubal infertility. Thus, in women with tubal infertility there were significantly more common inflammatory diseases of the kidney (p <0.01 and p <0.05), and with combined and endocrine infertility - cardiovascular disease (p <0.01 and p <0.05) and thyroid pathology (p <0.05)

3. Conclusions: Thus, the results of clinical characteristics of patients with infertility of various origins, they are most at risk of developing obstetric and perinatal pathology due to the high initial frequency of reproductive disorders because of a significant level of genital pathologies of inflammation and disgormonal origin. Besides, it is worthy to pay attention to high incidence of concomitant extragenital pathology of different genesis.

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