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РЕПРОДУКТИВНОГО ТА ПОСТРЕПРОДУКТИВНОГО  
ПЕРІОДІВ

**THE RELATIONSHIP BETWEEN THE PATHOLOGICAL COURSE OF  
THE GESTATION PERIOD AND THE EXPERIENCED ACUTE  
RESPIRATORY INFECTION AT DIFFERENT TERMS OF PREGNANCY**

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**Resume.** The most typical gestational complications after acute respiratory infections are: placental dysfunction (22.4%), fetal growth retardation syndrome (9.9%), intrauterine infections (22.4%), congenital malformations of the fetus (7.8%). An increase in the frequency of placental dysfunction by more than 2 times in the early stages significantly increases the likelihood of developing fetal growth retardation syndrome by 1.8 times. The risk of fetal pathology increases 3.1 times with an acute respiratory infection suffered in the 1st trimester, 1.5 times with an acute respiratory infection in the 2nd trimester and 2.6 times with an acute respiratory infection in the 3rd trimester of gestation. The time interval between an episode of acute respiratory infection and the manifestation of placental dysfunction is  $8.64 \pm 1.13$  weeks.

**Key words:** acute respiratory infection, gestational complications, placental dysfunction.

The incidence of acute respiratory viral infections, including influenza, significantly exceeds the incidence of all other known human infectious diseases [1, 2]. The incidence of respiratory infections during the gestational period reaches 35.6% [3, 4]. In recent years, a number of studies have appeared devoted to the study of immediate and long-term complications on the course of physiological pregnancy.

There is very discrepant evidence that viral infections in the mother may increase the risk of perinatal complications, such as congenital malformations of the fetus, placental dysfunction, fetal growth restriction syndrome, and infections of the perinatal period. [5, 6].

There is insufficient information in the literature about the possible complications of acute respiratory infections (ARI) depending on the stage of pregnancy, which necessitates further study of this problem.

*The purpose of the work* is to determine the relationship between pregnancy complications and acute respiratory infection at different stages of gestation.

To achieve this goal, a retrospective study was conducted on 232 women who were practically healthy before gestation and who had suffered an acute respiratory infection at various stages of pregnancy. The course of pregnancy and delivery, the condition of the fetus, and the health of newborns were taken into account as control (surrogate) points. As a control, 65 cards of practically healthy pregnant women who did not suffer from respiratory infections during the gestational period were randomly selected. Depending on the localization of the respiratory process, pregnant women were divided into groups: ARI of the upper respiratory tract (URT) (rhinitis, nasopharyngitis, tracheitis, laryngitis) (n=124) and ARI of the lower respiratory tract (LRT) (bronchitis, bronchiolitis) (n= 108). In turn, depending on the gestational age in which they suffered ARI, pregnant women were divided into 3 groups: 1 subgroup consisted of 58 pregnant women with ARI in the first trimester of gestation; group 2 – 66 pregnant women with ARI in the 2nd trimester of gestation; 3rd – 108 pregnant women who had ARI in the 3rd trimester of gestation.

The distribution of pregnant women by age showed that pregnant women aged 21-25 years were most often observed ( $22.8 \pm 2.18$ ).

A study of the course of pregnancy showed high levels of miscarriage's hazard (44.4% and 22.7%), which were complicated by spontaneous miscarriages in 13.9 and 9.1%, respectively, and non-developing pregnancy in 13.9 and 22.7%, respectively, women after ARI in URT and LRT suffered in the 1st trimester (Table 1). Further observation of pregnant women who had ARI in the first trimester

showed the development of placental dysfunction in 36.4% of women with ARI in LRT and in 30.6% of women with ARI URT, which were complicated by the development of fetal growth retardation syndrome. Congenital malformations of the fetus were observed in 11.1% and 9.1% of pregnant women with ARI URT and LRT, respectively. It should be noted that the development of complications did not depend on the location of the lesion in ARI, except for the miscarriage's hazard and miscarriages, which were more common in the group with ARI LRT. It is noteworthy that congenital malformations of the fetus were observed more often in the group with ARI of the fetus.

A study of the course of pregnancy in women who suffered ARI in the second trimester showed the development of placental dysfunction in 19.0% and 12.5% of women with ARI of URT and LRT, respectively. Fetal growth retardation syndrome was observed almost 2 times more often in the group with ARI LRT.

The most common manifestations of placental dysfunction were hydramnios and oligohydramnios. In the third trimester, pregnancy in these women was complicated by the development of preeclampsia (4.8% and 16.7, respectively, in ARI URT and LRT) and the development of premature birth in 9.5 and 8.3%, respectively, in ARI URT and LRT.

A study of the course of gestation in pregnant women who suffered ARI in the third trimester showed a high risk of premature birth, which was observed in almost half of the women. At the same time, premature birth developed only in 1/3 of these women and was more than 2 times more common in the group with ARI LRT. In 1/5 of women with ARI in the 3rd trimester, placental dysfunction developed, which was almost the same in the groups. Whereas fetal growth retardation syndrome was 2 times more common in the group with ARI LRT and averaged 9.3%.

With ARI in the third trimester, as well as in the first trimester, congenital malformations of the fetus were noted, which amounted to 11.1%. It should be noted that mild preeclampsia developed in 13% and 17.7% of pregnant women with ARI URT and LRT, respectively, in the third trimester. Whereas, severe preeclampsia was observed after ARI in the third trimester in 4.3% and 6.5%, respectively.

Preterm delivery occurred in 16.1% of pregnant women with ARI URT, which is 2 times more often than in the group with ARI LRT. In one case, due to the development of stage 3 disorders of the uteroplacental-fetal blood flow, the pregnancy was terminated early. During the same period, women also had fetal malformations in equal numbers in both groups. An increase in the frequency of placental dysfunction more than doubling in the early stages led to the same high rates of fetal growth retardation syndrome in ARI in the first trimester. The forms of fetal growth retardation syndrome depended on the period in which ARI was suffered, i.e., early development of placental dysfunction and did not depend on the location of the lesion. Thus, the symmetrical form of ORP was most often observed in the group with ARI in the first trimester. The time interval between ARI and the manifestation of PD symptoms was  $8.64 \pm 1.13$  weeks.

**Table 1**

**Frequency of complications during pregnancy period depending on acute respiratory infection**

Complications	Group 1 (n=58) abs./%	Group 2 (n=66) abs./%	Group 3 (n=108) abs./%	Test of significance
Miscarriage's hazard	36,2	24,2	48,1	p, p <sub>1</sub> <0,05
Miscarriage	12,1	6,1	-	p<0,05
Preeclampsia	8,6	9,1	21,3	p, p <sub>1</sub> <0,05
Oligohydramnios	13,6	7,6	1,9	p, p <sub>1</sub> <0,05
Hydramnios	20,7	21,2	18,5	p <sub>1</sub> <0,05
Placental insufficiency (dysfunction)	32,8	16,7	20,4	p, p <sub>1</sub> <0,05
Fetal growth retardation syndrome	13,8	7,6	9,3	p, p <sub>1</sub> <0,05
Congenital malformations	10,3	-	11,1	p <sub>1</sub> <0,05
Preterm delivery	6,9	9,1	15,7	p, p <sub>1</sub> <0,05

*Note:* p - significance of differences in the values of signs in groups with ARI in the 2nd and 3rd trimester relative to the group with ARI in the 1st trimester; p<sub>1</sub> - significance of differences in the values of characteristics in group 2 relative to group 3.

The average time of delivery did not differ in groups with different localization



of ARI lesions; only very early preterm birth was observed in the group with ARI LRT.

Thus, the most typical gestational complications after ARI were: placental dysfunction, fetal growth restriction syndrome, intrauterine infections, congenital malformations of the fetus. An increase in the frequency of placental dysfunction by more than 2 times in the early stages significantly increases the likelihood of developing fetal growth retardation syndrome by 1.8 times.

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