Changes In Hematological Parameters In Pregnant Women With Covid-19

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ABSTRACT

Asymptomatic COVID-19 infection was recorded in 84.6% of pregnant women in the experimental group. In pregnant women with signs of viral infection, the disease was mild. There were no statistically significant differences in D-dimer between the experimental and control groups, but there was an increase in its level in 29.1% of pregnant women with coronavirus infection (815-8307 ng/ml) and in 27.3% of pregnant women from the control group (703-1175 ng/ml). In pregnant women with a confirmed diagnosis of COVID-19, compared with controls, a shortening of the APTT test was significantly more often observed (p = 0.032), and these changes, along with a decrease in R-APTT, were more common in individuals with clinical manifestations of coronavirus infection (p = 0.0025). Pregnant women with elevated levels of D-dimers had a higher level of CRP (p = 0.043), the level of prothrombin was lower (p = 0.05), and the INR was higher (p = 0.003). There was also a decrease in the number of erythrocytes (p=0.031), an increase in the number of monocytes (p=0.0067) and a decrease in the proportion of segmented neutrophils (p=0.0024).

Keywords: pregnant women, coagulopathy, COVID-19, D-dimer

Introduction

With the increase in the incidence of COVID-19, the number of cases of this infection in pregnant women has increased. Changes in the hemostatic system during physiological pregnancy are characterized by procoagulant imbalance. Induction of hypercoagulation increases the risk of complications and adverse outcomes associated with infection of pregnant women with SARS-CoV-2. In addition, the new coronavirus infection significantly aggravates the pathology of pregnancy (gestational diabetes, etc.) and, conversely, the pathology of pregnancy can aggravate the course of COVID-19.

Materials And Methods

Pregnant women in the third trimester of gestation (132 people) who underwent inpatient treatment at the emergency hospital in Andijan were examined, of which 91 patients were diagnosed with "SARS-CoV-2 viral infection" - the experimental group and 41 pregnant women without coronavirus infection – control group. The experimental group was divided into subgroups depending on the presence or absence of clinical manifestations of COVID-19.

Women in the study groups were comparable in age and stage of pregnancy. The age of pregnant women in the experimental group is from 19 to 40

years, median (Me) is 29 years, lower quartile (Q25) is 25 years, upper quartile (Q75) is 32 years, gestational age is from 194 to 287 days (Me – 258 , Q25 – 208, Q75 – 273). Inclusion criteria were reproductive age, positive PCR results for the presence of SARS-CoV-2 virus RNA in a nasopharyngeal smear and/or detection of IgM against SARS-CoV-2 virus antigens in the blood, as well as the presence of informed consent to conduct the study.

The age of the subjects in the control group ranged from 17 to 40 years, median (Me) – 30 years, lower quartile (Q25) – 27 years, upper quartile (Q75) – 34 years, gestational age from 188 to 284 days (Me – 282 , Q25 – 225, Q75 – 273). Criteria for inclusion in the control group: reproductive age, negative PCR results for the presence of SARS-CoV-2 virus RNA in a nasopharyngeal smear and/or detection of IgM in the blood against SARS-CoV-2 virus antigens, as well as the presence of informed consent conducting research.

Results And Discussion

During the clinical study, the majority of pregnant women with COVID-19 had a burdened somatic and obstetric-gynecological history. The most common diseases were chronic tonsillitis (14.3%), diabetes mellitus (10.9%), thyroid diseases (6.6%), chronic urinary tract infections (17.6%) and chronic gastrointestinal diseases. intestinal tract (12.1%). In the control group, diseases of the urinary system (27.3%), cardiovascular (12.2%) and endocrine pathologies (12.2%) predominated.

Analysis of the obstetric history revealed a high frequency of complications in previous pregnancies in women with COVID-19 infection, of which: 9.9% were spontaneous miscarriages in the first and second trimesters of gestation, 8.8% were non-developmental miscarriages. During all pregnancies, ectopic pregnancy was noted in 1.1% of cases. In the control group, a history of miscarriages was identified in 9.8% of pregnant women, cases of frozen pregnancy – in 4.9% of women. Artificial abortion in the anamnesis was noted in 8.8% of patients in the experimental group and in 7.32% of women in the control group.

An asymptomatic course of COVID-19 infection was recorded in the majority of patients in the experimental group (84.6%), the remaining pregnant women had signs of a viral infection, and the disease was mild. The main clinical manifestations of SARS-CoV-2 were: hyperthermia (57.1%), nasal congestion or runny nose (57.1%), general weakness (28.6%), cough (14.3%), loss of smell and taste (7.1%).

According to the X-ray examination, in most cases, characteristic signs of viral pneumonia in women with clinical manifestations of infection were absent, and only one pregnant woman with a mild infection showed signs of right-sided lower lobe pneumonia. In six pregnant women in the experimental group, changes in the pulmonary pattern (intensification/deformation) were verified, of which only three had clinical signs of infection.

The average delivery time in the experimental group was 37.2 (35.5-39.4) weeks, which is statistically significantly lower than in the control group - 39.1 (38.7-40.0) weeks (p= 0.027). In the experimental group, pregnancy ended in natural birth in 50.5% of women, and delivery by cesarean section in 9.6% of women. In the control group, birth through the birth canal occurred in 70.4% of women, and by caesarean section in 29.6% of women. Preterm birth was more common in patients in the experimental group: it occurred in 9.9% of women (p = 0.044).

The average score of newborns on the Apgar scale in the experimental group was: 1' – 8.01 points, 5' – 8.52 points. The assessment of newborns on the Apgar scale in the control group was: 1' – 8.56 points, 5' – 9.08 points.

A hemostasiological study revealed a statistically significant shortening of the APTT test in the group of pregnant women with a confirmed diagnosis of COVID-19 compared to the control group (p=0.032). A shortening of APTT was observed in 33.3% of pregnant women in the experimental and 9.1% of women in the control group.

During the study, special attention was paid to the highly sensitive marker of thrombinemia – D-dimer. There were no statistically significant differences in the values of this indicator between the experimental and control groups.

However, there was an increase in the level of D-dimers in 29.1% of pregnant women with coronavirus infection and in 27.3% of pregnant women in the control group. The level of D-dimers ranged from 815 to 8307 ng/ml (min-max) in the experimental group and from 703 to 1175 ng/ml in the control group. An increased level of D-dimers indicates a high coagulation potential and the risk of thrombus formation [1]. An increase in the fibrinogen metabolite, D-dimer, in coronavirus pathology was noted earlier and described in many clinical studies [2]. However, the clinical significance of its increase in COVID-19 in pregnant women has not been fully determined.

Conclusion

The identified deviations may indicate the presence of disturbances in the blood coagulation system in pregnant women with asymptomatic or mild COVID-19 in the direction of hypercoagulable processes, and these changes are statistically significantly more common in people with clinical manifestations of coronavirus infection.

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