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Analysis of The Course of Pregnancy and Child in Women with Excessive Weight Gain During a Pandemic Covid-19

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Abstract

During the pandemic of COVID-19, many women faced the problem of pregnancy and pregnancy. Eto mojet byt vyzvano ne only izmeneniem obraza jizni, no i stressom kotoryy ispytyvayut mongie lyudi iz-za pandemii. V etom analize nami bylo izucheno techenie memennosti i rodu u zhenschin khrezmernoy extrabavkoy vesa v vrya memennosti v vrya pandemia COVID-19. A total of 97 women were observed, which were divided into 2 groups. The basic group of 62 women with abnormal weight gain and pregnancy, and the control group of 35 women with physiological pregnancy. V nashem issledovanii byli ispolzovany sleduyushchie metody: collection anamnesis, obshcheklinicheskie, instrumentalno-laboratornye metody, ekusherskie metody issledovaniya. The results obtained in the study of the effect of cross-sectional increase in body mass during the COVID-19 pandemic have shown the peculiarities of the course of pregnancy and gender, which are independent of the pre-gravid mass and pregnant women are related to the group of high-risk development, and the probability of the development of a proportional cross-sectional increase in weight and time pregnancy.

Keywords: *COVID-19, Pregnancy, Mass Gain, Preeclampsia, Gestational Diabetes, Caesarean Section*

1. Introduction

Normal gestational body weight gain is associated with improved pregnancy and birth outcomes. It was considered that the COVID-19 pandemic may change the diet and physical activity of pregnant women and lead to excessive body weight gain during pregnancy, as well as the development of complications during pregnancy and childbirth. Relevance of the topic under investigation. Pregnancy is a period when a woman should be especially careful about her health and nutrition. During the COVID-19 pandemic, many women have experienced excessive weight gain during pregnancy. This is due not only to lifestyle changes, but also to the stress many people are experiencing due to the pandemic. It should be noted that excessive weight gain can lead to health problems for both mother and child. One of the most common complications associated with excess weight gain during pregnancy is gestational diabetes. This condition is characterized by high blood glucose levels and can lead to various problems such as premature birth, large fetus and other complications. In addition, excess weight gain during pregnancy can lead to increased blood pressure in the mother and obstetric complications such as preeclampsia and eclampsia. Also, excess weight gain during pregnancy can affect the health of the child. In this case, the baby causes respiratory and cardiovascular system disorders [9]. To prevent pregnancy complications to excess weight gain, women are advised to monitor their health and nutrition. It is important for the baby and the mother to eat a healthy diet that contains all the necessary nutrients. In addition, women should pay more attention to physical activity even at home. Regular physical exercise or other forms of exercise, such as fitness or yoga, can help women maintain a healthy weight and improve overall well-being [7]. Research on this topic has shown that during the COVID-19 pandemic, many women are facing the problem of weight gain during pregnancy. One of the reasons for this may be a change in lifestyle. For example, due to the quarantine, many women began to exercise less and spend more time at home, which led to weight gain. In addition, the stress caused by the pandemic may also affect weight gain during pregnancy. Research by many scientists has shown that stress can lead to an increase in the level of the hormone

cortisol, which increases appetite and leads to overeating. In conclusion, weight gain during pregnancy is normal, but excess weight can lead to health problems. On March 11, 2020, the WHO declared a pandemic regarding COVID-19 and urged people to “stay at home” [3]. As a result of the closure of many places (eating places, sports facilities, schools, stores, etc.) [8] , the movement of people was greatly limited [6]. This change in lifestyle has caused excessive weight gain in pregnant women. The purpose of the study: to analyze the course of pregnancy and childbirth complications in women with pathological increase in gestational body weight during the COVID-19 pandemic

2. Materials And Methods

Based on the goals and tasks set before us, pregnant women were examined using different methodological methods. Research work was carried out at the Department of Obstetrics and Gynecology of SamDTU DKTF (head of the department - professor LR Agababyan) and at the 2nd maternity hospital of Samarkand city, at the 2nd family polyclinic of Samarkand city. The main direction of the research was to see the frequency of pathological increase in gestational body weight and associated obstetric, perinatal, postgravid complications during the COVID-19 pandemic. The examined women were divided into 2 groups:

The main group - 62 pregnant women with a pathological increase in body weight during the COVID-19 pandemic, The control group was composed of 35 women whose pregnancy was conditionally monitored physiologically and whose TVI was normal. The average age of the examined women was 25.4±0.3. Most of them were of early reproductive age: 92% were women aged 18-35, and 8% were women over 35 (Figure 1).

Figure 1: Age distribution of examined women

All women lived in Samarkand region. Most of them (61.9%) had secondary specialized education, 33.5% had higher education and 4.6% had secondary education (Figure 2).

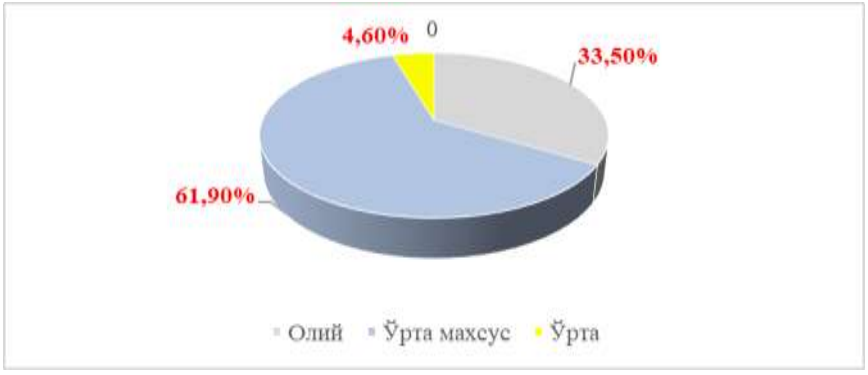

Figure 2: Information of the examined women

Almost all women reported that they suffered from infectious diseases in early childhood. About half of the examined women had a history of aggravated somatic pathology (48%) (Fig. 3). Cardiovascular diseases are common among somatic pathologies (arterial hypertension, mitral valve prolapse); in the next place, diseases of the urinary system (cystitis, pyelonephritis); diseases of the nervous system, respiratory system (pneumonia, bronchitis), gastrointestinal diseases (gastritis, biliary tract dyskinesia), thyroid gland diseases were also encountered. 2% of women had surgical procedures for appendicitis and hernia in their anamnesis.

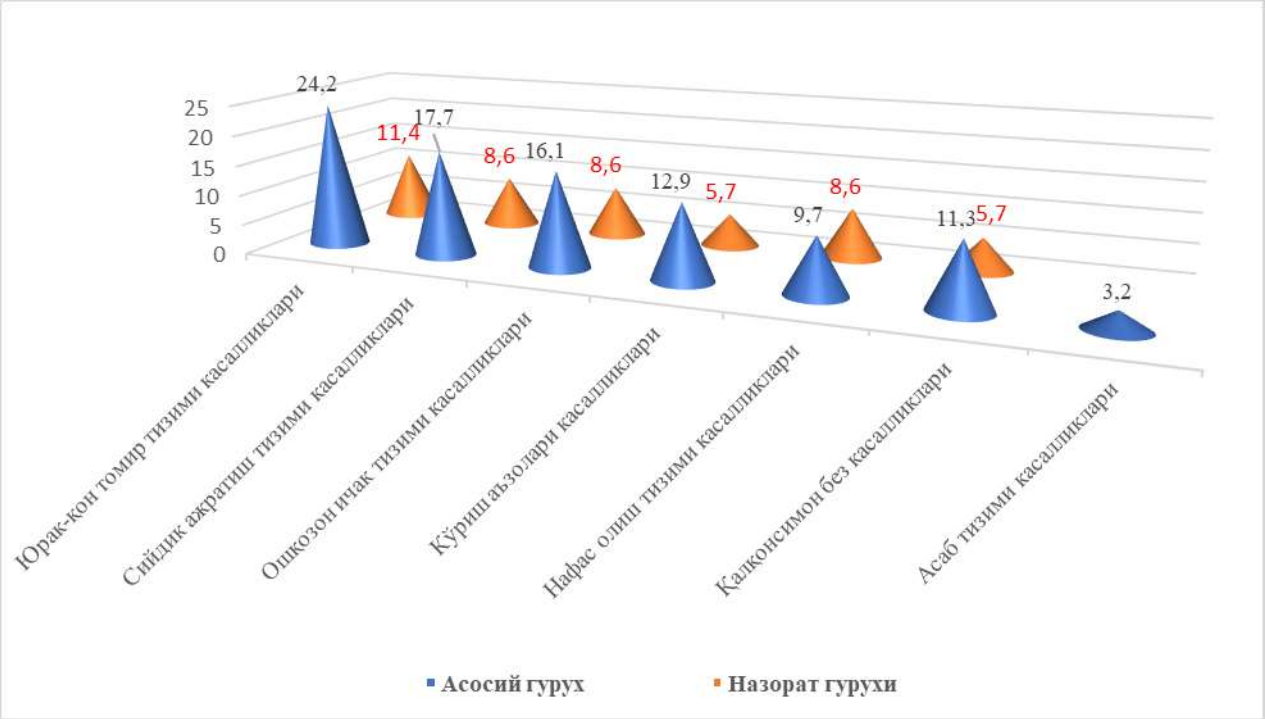

Figure 3: Somatic diseases in the anamnesis of women in observation groups (%)

Analyzing the above picture, it can be said that the main group had more somatic pathology than the comparison group. Cardiovascular diseases (24.2% and 11.4%), urinary system diseases (17.7% and 8.6%), gastrointestinal system diseases (16.1% and 8.6%), thyroid gland diseases (11.3% and 5.7%) were 2 times more frequent.

Menstrual activity, gynecological diseases and reproductive anamnesis were analyzed. The average age of menarche was 13.1±0.3 years in the main group and 13.3±0.4 years in the control group. The duration of the menstrual cycle did not reliably differ in the examined groups, its duration was around the norm, 3-7 days. But in the women of the main group, oligomenorrhea was 9.7%, dysmenorrhea was 8.0%, and menorrhagia was 6.4%.

Gynecological anamnesis is presented in Table 1.

Table 1: The structure of chronic gynecological diseases of the examined women (n = 97)

Diseases	**Women's groups under investigation**					
	main group (n= 62)		**control group (n= 35)**		**Total (n= 97)**	
	abs.	%	abs.	%	abs.	%
Cervical diseases	12	19.4	4	11.4	16	16.5
Hyperplastic processes of the endometrium	8	12.9	2	5.7	10	10.3
Uterine myoma	6	9.7	1	2.9	7	7.2
endometriosis	4	6.5	1	2.9	5	5.2
Ovarian cysts and tumors	5	8.1	1	2.9	6	6.2
TPKS	8	12.9	2	5.7	10	10.3
Ectopic pregnancy	2	3.2	1	2.9	3	3.1
infertility	9	14.5	2	5.7	eleven	11.34

Analyzing Table 1, it can be said that women of the main group had more gynecological diseases compared to the control group; cervical diseases in the main group 19.4%, and in the control group 11.4%; hyperplastic processes of the endometrium occurred in 12.9% of the main group and 5.7% of the control group; uterine fibroids were 9.7% in the main group and 2.9% in the control group, etc. encountered It is noteworthy that TPKS and infertility were 2 times higher in the group of women with pathological weight gain compared to the control group. The group of women was almost the same in terms of pregnancy and birth parity (Figure 4).

Figure 4: Distribution of pregnancies and births by parity in the examined women (%)

13.4% (13 women) were pregnant for the first time and gave birth for the first time. In the anamnesis, spontaneous abortion was observed in 5 women before the current delivery. The rest (94.8%) were those who were repeatedly pregnant and had repeated births. In the anamnesis, 21 women (21.6%), including 13 (13.4%) - had multiple abortions before the current delivery. The obtained data allow us to conclude that the majority of observed women did not use contraceptive methods or used low-effective methods of pregnancy prevention and regulated family planning with abortions.

After the tests, after our calculations, it became clear that the average height of the women in the control group was 165.7±1.2 cm, and the control group was 166.2±1.1 cm. Body weight indicators in the main group were 66.7±0.5 kg; and in the control group it was 64.4±0.6 kg. TVI was 23.4 ±0.3 in the main group kg/m (22.2-23.7), and 22.6±0.4 in the control group kg/m (20.9-23.6).

Thus, if the body mass index is not too high, one-third of pregnant women are overweight before pregnancy. Body mass index during pregnancy averaged 13.1±0.3 kg in the main group and 11.8±0.2 kg in the control group.

In our research, we used the following

Observation of women began in the first trimester of pregnancy. Anamnesis data, somatic and gynecological pathology, and information on reproductive function were collected based on the individual card of pregnant women. General clinical, instrumental and laboratory, obstetric examinations were performed.

The woman's body weight was measured on a scale, height measured was on a rodometer, and body circumference was measured on a cm tape.

According to Bray (1978), TVI was determined by the following formula: ***TVI= kg/m2.***

The eating habits of women were studied through a specially designed questionnaire.

3. Results and Discussion

In our analysis, a pathological increase in gestational body weight during the COVID-19 pandemic showed a high incidence of preeclampsia (in 15 pregnant women out of 62 in the main group -24.2%; in 3 women in the control group - 8.6%) . Preeclampsia of moderate severity in the main group of pregnant women - 9.7%; and in the control group – 2.9%. In the next phase of our study, we

investigate the relationship between pathological weight gain during the COVID-19 pandemic and the level of vitamin D saturation in the examined women .

A pathological increase in gestational body weight was observed, that is, pregnant women in the main and control groups were further divided into three subgroups according to the level of saturation of the body with vitamin D: subgroup A - pregnant women with a normal level of saturation of the body with vitamin D (more than 30 ng/ml), V subgroup - pregnant women with an insufficient level of saturation of the body with vitamin D (>21< 29 ng/ml) and subgroup C - pregnant women with vitamin D deficiency (less than 20 ng/ml).

Thus, the study showed that the main group of pregnant women had 3.2 times more cases of deficiency and deficiency of vitamin D than in the control group.

The recommended dose of vitamin D during pregnancy is 800-1200 IU/ milk . During the COVID-19 pandemic, such a dose does not allow to provide a sufficient level of 25(OH)D 3 in pregnant women who have observed a pathological increase in gestational body weight. Increasing the dose to 2000 IU/milk adequate provides blood levels of vitamin D in most women. In some complications of pregnancy (pre-eclampsia, placental insufficiency, gestational diabetes), the acceptable and safe dose is 4000 IU/milk throughout pregnancy [10].

Thus, insufficient supply of vitamin D is a public health problem worldwide. Due to its multifaceted regulatory effects (on immunity, biochemical and cellular processes), vitamin D is an extremely important factor that determines the positive course of pregnancy, adequate fetal and postnatal development of the child. Therefore, preventing insufficient supply of vitamin D in pregnant women and newborns should be an indispensable component in the preventive work of not only pediatricians and neonatologists, but also obstetricians and gynecologists. During the COVID-19 pandemic, the pathological increase in gestational body weight lays the groundwork for the development of preeclampsia, because the growth of the abdominal fat layer increases intra-abdominal pressure.

Diet also affects the development of preeclampsia in the pathological increase of gestational body weight. When starting this part of the research work, we took into account that the environment, national and family traditions, social status and culture, specific features of upbringing are of great importance in shaping the eating behavior of pregnant women during the COVID-19 pandemic. We used a questionnaire to assess the eating behavior of the patients , this questionnaire consists of 7 parts, the 1st part evaluates the diet before pregnancy, the 2nd part assesses dieting, the 3rd part helps to determine the amount and number of meals and the following ones help to determine the type of food. All data were evaluated according to the point system. This survey is a national poll in our country conditions, and nutrition during the COVID-19 pandemic we have adapted. The survey is independent of the respondents respectively filling and collected calculation of scores h for intended . Our research shows that during the COVID-19 pandemic, 25.8% of women in the main group of pregnant women consumed foods enriched with fats. Frequent consumption of fatty foods was observed in almost half of the respondents, ie 48.4%. In the main group, the mean total score for frequency of fat consumption was 24.8±0.6, indicating a significant consumption of fatty foods by overweight women. Further participation in the study was carried out when recommendations were followed, such as eating less foods rich in animal fats, replacing them with fish, grains, legumes, vegetables and fruits, as well as vegetable oils.

Women in the main group (OUTSIDE THE CONTROL GROUP) received advice on a properly balanced diet: they were told to include in the diet more than three products that received the minimum score (in our study, these were all grains, legumes, and sugar products).

In addition to preeclampsia, the development of other pregnancy complications during the COVID-19 pandemic was not observed as a result of excessive body weight gain of pregnant women. But during the COVID-19 pandemic, we observed the following changes as a result of excessive weight gain of pregnant women (Table 2) .

Table 2: Gestational complications during the COVID-19 pandemic in the examined women (n=97)

Complications	**Women's groups under investigation**			
	main group (n= 62)		**control group (n= 35)**	
	abs.	**%**	**abs.**	**%**
Preeclampsia	15	24.2	3	8.6
Risk of miscarriage in the **1st** trimester	9	14.5	3	8.6
The risk of miscarriage in the **2nd** trimester	7	11.3	2	5.7

Risk of miscarriage in the **3rd** trimester	5	8.1	2	5.7
Anemia	58	93.5	thirty	85.7
Vulvoganitis	12	19.4	4	5.7
Urinary tract infection	eleven	17.4	3	8.6
Gestational diabetes	13	21	1	2.9

risk of miscarriage. As can be seen from the table above, the risk of pregnancy loss in the 1st trimester is 1.7 times higher in women of the main group than in the **control** group . 2 times the risk of miscarriage in **the** 2nd trimester of pregnancy ; the risk of miscarriage in **the** 3rd trimester of pregnancy is 1.4 times higher. It is noteworthy that 2 times more women were hospitalized when the risk of miscarriage was observed in the main group compared to the control group. Analysis of the current literature shows that progestogens, used in the risk of miscarriage, can also cause excessive body weight gain.

Anemia . During the COVID-19 pandemic, anemia, which develops as a result of excessive weight gain in pregnant women , is a serious problem that can cause various complications for the mother and the child. Being overweight can affect iron levels in the body because the body's need for iron increases during pregnancy. Overweight women have a higher risk of developing anemia during pregnancy than women of normal weight. This is because they may have low iron levels due to a lack of nutrients in their diet. Symptoms of anemia in overweight women during pregnancy can be as follows: weakness, fatigue, dizziness, pale skin and mucous membranes. In addition, women with anemia may experience palpitations, shortness of breath, and headaches. During the COVID-19 pandemic, it is necessary to monitor the diet of pregnant women to prevent anemia, which develops as a result of excessive weight gain. The diet should include iron-rich foods such as meat, fish, eggs, green vegetables and fruits. It is also recommended to consult a doctor to prescribe special complexes of vitamins and minerals for overweight women. But almost 89.6% of the women we observed were anemic. We witnessed that the amount of erythrocytes during pregnancy in all women changed proportionally to the increase in body weight (Table 3) .

Table 3: Hemogram values during the COVID-19 pandemic in the examined women (n=97)

indicators	**Women's groups under investigation**	
	main group (n= 62)	**control group (n= 35)**
1st trimester of pregnancy		
The number of erythrocytes is 12x10	4.2 ± 0.3	4.1 ± 0.5
Hemoglobin concentration , g/l	92 ± 0.7	96 ± 0.4
Amount of platelets, x10 ^{9}	222 ± 0.6	231 ± 0.7
2nd trimester of pregnancy		
red blood cells is 12x10	3.6 ± 0.6	4.0 ± 0.6
Hemoglobin concentration , g/l	88 ± 1.4	94 ± 1.2
Amount of platelets, x10 ^{9}	220 ± 0.4	229 ± 0.5
3rd trimester of pregnancy		
The number of erythrocytes is 12x10	3.4 ± 0.3	3.8 ± 0.3
Hemoglobin concentration , g/l	87 ± 0.8	92 ± 0.6
Amount of platelets, x10 ^{9}	218 ± 0.9	228 ± 0.5

Urinary tract infections. It was observed that pathological weight gain during pregnancy increases the risk of developing genital inflammatory diseases and urinary tract infections (in the main group - vulvovaginitis 19.4%, urinary tract infections 17.4%; in the control group - 5.45 and 8.6%. In the next phase of our study, the pathological increase in gestational body weight during the COVID-19 pandemic and the associated delay in delivery were studied.

In the main group, 50 women (80.6%) had a natural delivery, 12 - 19.4% had a cesarean section, 7 (11.3%) had a planned cesarean and 5 - 8.1% emergency caesarean section was performed. The main indication for the planned cesarean section was the presence of a scar on the uterus (in 4 women), the fetus was lying in the groin in 1 patient, and the remaining 2 were operated on the basis of relative indications (conflicting obstetric and gynecological anamnesis, somatic diseases). Labor was induced by amniotomy in 6 women (9.7%) in the main group, uterotonics were used in 3 women. Premature discharge of amniotic fluid, preeclampsia, and pregnancy over 41 weeks were considered indications for labor induction. 3 women underwent an emergency cesarean section due to inefficiency of labor induction (4.8%) (Fig. 5) .

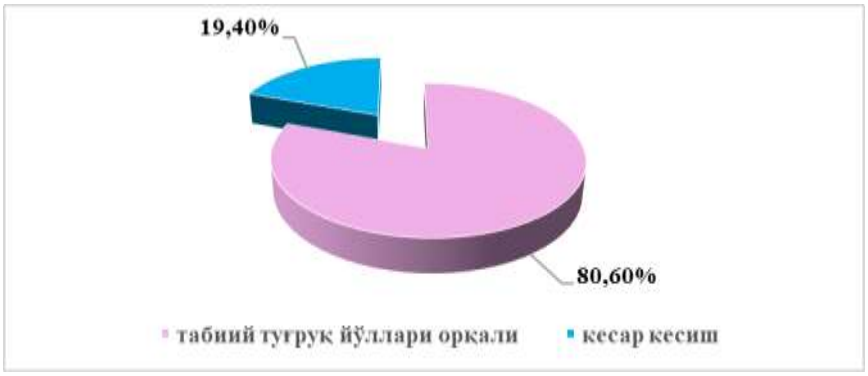

Figure 5: The type of delivery that occurred in the examined women

Table 4: Birth periods in the control groups (n=97)

Gestation period	Women's groups under investigation main group (n= 62)		control group (n= 35)	
	abs.	%	abs.	%
37 - 38 weeks	12	19.4	4	11.4
39 - 40 weeks	34	54.8	24	6.9
More than 40 weeks	16	25.8	7	20

The frequency of induction did not appear to be significantly related to body weight gain.

Table 5: Obstetric complications in the control groups (n=97)

Gestation period	Women's groups under investigation main group (n= 62)		control group (n= 35)	
	abs.	%	abs.	%
Premature discharge of hemorrhoids	28	45.2	12	34.3
Birth anomalies	23	37.1	8	22.9
Birth tract trauma	16	25.8	3	8.6
Atonic bleeding	3	4.8	1	2.9
Placental defects	2	3.2	1	2.9
Postpartum endometritis	4	6.5	1	2.9

premature discharge of amniotic fluid in the main group is 1.3 times higher than in the control group, labor anomalies and atonic bleeding **are** 1.6 times higher; birth canal traumas - 3 times; placental defects increased **by** 1.1 times and postpartum endometritis **by** 2.2 times (Table 5).

Thus, during the COVID-19 pandemic, the results obtained during the study of the effect of excessive body weight on the specific characteristics of pregnancy and childbirth showed that, regardless of body weight, pregravid women in these women are in the high risk group for the development of various obstetric complications, and the probability of its development is proportional is considered

The process of pregnancy is a remarkable phenomenon in terms of the emergence of a force capable of changing its homeostasis from within the female body.

The debate about how much body mass a woman should gain during pregnancy has been going on for decades. Based on the analysis of a large number of literature sources, they proposed recommendations for weight gain depending on the initial body mass index. However, all researchers offer different suggestions. However, no alternative recommendations have been proposed to date, so we, like most clinicians, relied on WHO recommendations in our research.

Obstetricians and gynecologists have a special responsibility during the COVID-19 pandemic : according to the world guidelines, it is not recommended to plan pregnancy and postpone childbirth until the post-covid period .

Novel coronavirus infection (NCoV) is a disease caused by a new viral pathogen called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The World Health Organization (WHO) declared the current 2019 coronavirus disease outbreak, called severe acute respiratory syndrome coronavirus (SARSCoV-2), a pandemic on March 11, 2020 [3]. It is of great importance to study the biological

role of vitamin D during pregnancy and in the formation of the health of the future child. Based on the new views on the physiological functions of vitamin D, metabolic processes of vitamin D in the mother-placental-fetus system, as well as the perinatal effects of its metabolites, are of great interest. It is known that the placenta performs the function of endocrine glands and serves as an intermediary in the formation of the mother-fetal system [*5*].

Improving the diet and normalizing body weight is the basis for the normal course of fertilization and gestation. As a result of improper nutrition, the balance of vitamins and micronutrients is disturbed, their deficiency increases perinatal risk.

It is recommended to normalize body weight in women with increased body weight and obesity. Correcting lifestyle and diet is the optimal way to normalize body weight. The safest and most effective way to normalize body weight is to lose 0.5-1 kg per week and then maintain that weight for a long time. Loss of muscle and bone tissue is not observed and water balance is maintained. Of course, it should be under the supervision of a nutritionist and an endocrinologist. In the absence of therapeutic lifestyle modification (loss of less than 5% of body weight for 3 months), drug therapy is prescribed [*1,11*].

Thus, the information presented above allows us to consider insufficient and excessive weight gain as truly pathological and determines the need to find ways to prevent them. The most promising ways to solve this problem seem to us to influence the controlled factors. A number of researchers suggest the use of specially designed computer programs, telephone counseling, online counseling, and personal interviews to prevent pathological weight gain during pregnancy [3,7]. It is assumed that most women adhere to the suggested methods, but they do not receive the necessary information during routine dispensary follow-up [1,8]. In addition, some pregnant women, regardless of counseling, overestimate the role of their behavior, including food, and the role of external factors in the development of pregnancy complications. As a rule, these patients do not follow the recommendations and are often overweight [4].

4. Conclusion

In summary, the main results of this study are that the COVID-19 pandemic affects pregnant women's diet, physical activity, and stress during pregnancy, leading to excessive body weight gain and complications during pregnancy and childbirth. In our analysis, during the COVID-19 pandemic, a pathological increase in gestational body weight, one of the obstetric complications - preeclampsia - was seen (24.2% in 15 pregnant women out of 62 in the main group ; 8.6% in 3 women in the control group). During the COVID-19 pandemic, pregnant women should have iron-rich foods in their diet to prevent anemia, which develops as a result of pathological weight gain. It is also recommended to consult a doctor to prescribe special complexes of vitamins and minerals for overweight women. In all women, the amount of erythrocytes during pregnancy changed in proportion to the increase in body weight; 80.6% of women with pathological weight gain gave birth through natural childbirth, 19.4% underwent caesarean section, 11.3% of them had planned cesarean section and 8.1% had emergency cesarean section.

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