Original Article :

Paternal weight gain during pregnancy

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Abstract

Background & Aims:

Pregnancy and childbirth are periods in which physiological and psychological changes are experienced together in terms of expectant mother and father. The study aimed to investigate the effect of pregnancy on instinctive eating habits in father candidates and the relationship between gestational diabetes and this habit.

Methods:

This is a prospective study. Patients who applied to our clinic in the pre-pregnancy period between March 2017 and May 2020 were included in the study. Patients with risk factors for gestational diabetes were followed up together with their spouses. Participants were divided into two groups as those with and without gestational diabetes. The groups were compared in terms of socio-demographic characteristics, the number of pregnancies, and birth weights.

Results:

Among 299 pregnant women aged 26-36 in this study, 199 (66.5%) were diagnosed with gestational diabetes. The mean age was higher in the group diagnosed with gestational diabetes ($p<0.001$). In 113 (56.8%) of the gestational diabetes patients, blood sugar regulation was achieved with diet, and insulin therapy was required in 86 (43.2%) patients. When the weights of the patients and their spouses were compared before and after pregnancy, a significant difference was found between the groups in terms of initial and final weights. It was determined that dietary compliance was higher in spouses of pregnant women with gestational diabetes ($p<0.001$ vs. $p=0.039$).

Conclusion:

Gestational diabetes is more common in elderly patients; it can fight the disease with diet compliance. Dietary compliance of pregnant women and spouses is parallel, and this situation emerges due to lifestyle changes.

Keywords:

Gestational Diabetes, Weight Gain, Paternal

Introduction

The decision to become a parent is the first step in a lifelong process. Pregnancy and childbirth are periods in which physiological and psychological changes are experienced together in expectant mothers and fathers. While women used to bear this period alone, today's father candidates are more involved in this process. Thus, the bond established with the baby after birth becomes stronger[1-3].

Eating habits vary depending on genetic and socio-demographic characteristics of individuals and environmental factors. It is known that changes in daily life affect eating behaviors. Having a baby, experiencing the feeling of fatherhood is a significant change for men. The mental turbulence experienced during this period may cause uncontrolled food consumption. People prone to emotional eating feel the need to eat more often to feel good about disturbing thoughts. This need is usually met with foods rich in carbohydrates [4-7].

Weight gain during pregnancy varies between populations. According to the guideline published by the Institute of Medicine (IOM) in 2009, the frequency of pregnant women with appropriate weight varies between 25-40%. Excessive weight gain during pregnancy is a serious obstetric problem. Macrosomia, Gestational Diabetes Mellitus (GDM), pregnancy-induced hypertension, and the need for cesarean delivery are the short-term negative effects of this problem[8-10].

Gestational diabetes mellitus (GDM) is seen in 5–6% of all pregnancies. The most important factors that play a role in its occurrence are pre-pregnancy obesity and excessive weight gain during pregnancy. Other factors are diabetes in the family, diagnosis of GDM in a previous pregnancy, and macrosomic baby history. Women presenting in the pre-pregnancy period are followed closely if they are in the risk group for diabetes. However, changes that need to be made in living conditions are usually applied when pregnancy is diagnosed, or GDM is detected. Men participate more and more in pregnancy follow-up, and the experiences during pregnancy impact their lifestyle and habits[11-13].

This study aimed to investigate the effect of pregnancy on the instinctive eating habits of future fathers and examine the adaptation of spouses to the change in eating habits of pregnant women diagnosed with GDM.

Material & Method

Study design

Our study was designed prospectively. Our study sample consisted of 2980 patients who applied to Eskişehir Acibadem

Hospital Gynecology clinic for pregnancy follow-up in the pre-pregnancy period between March 2017 and May 2020. Of these, those with at least one risk factor for GDM were followed up in the endocrine clinic with their spouses. Diagnosis of diabetes in at least one of the first and second-degree relatives of the expectant mother, having a body mass index above 25, being diagnosed with GDM in a previous pregnancy, and history of macrosomic baby birth were determined as risk factors[14].

A 75 g oral glucose tolerance test (OGTT) was performed at 24-26 weeks of gestation for the participants who were followed up with their spouses during pregnancy. According to the test results, the participants were divided into two groups as those with and without GDM. Hunger, first-hour, and second-hour blood glucose levels were examined in the 75 g OGTT test performed in the morning after eight hours of fasting. Normal values of 92 mg/dL, 180 mg/dL, and 153 mg/dL were accepted, respectively. GDM was diagnosed in the participant with at least one high value. Participants with GDM were given 2100 calories of pregnancy diet per day. In addition, blood glucose was monitored four times a day, including morning fasting blood glucose and three times postprandial blood glucose.

The group without GDM was advised to gain the right weight according to the 2009 IOM gestational weight gain guide, and routine pregnancy follow-ups were continued with their spouses.

At least one risk factor for GDM was identified in 299 pregnant women and included in the study. The total number of risk factors for GDM identified participants, including their spouses, is 598. The researchers obtained measurements of the participants. Socio-demographic data were collected with forms prepared by the researchers.

Socio-demographic data

Age of pregnant, age of spouse, duration of the marriage, educational status, family type, working hours, and income rate determined based on the participants' statements. Education level, family type, working hours, and income were questioned because of their effects on weight gain. Education level, family type, working hours, and income rate were asked because of their effects on weight gain. Educational status was questioned through school types as low, secondary, and high education levels. In this way, it is aimed to measure the effect of the consciousness level of the participants. Due to the impact of working hours on the psychological state of people, it was questioned as working daytime or night. The minimum

wage in Turkey is approximately 3000 TL. Income status was questioned as below or above the minimum wage.

Statistics

The participant's weight before and after pregnancy was recorded, and a comparison was made between the groups in terms of initial and final weight. Socio-demographic characteristics, GDM treatments, number of pregnancies, birth weights, and weight values of the groups were compared. According to the nature of the data, mean, median, standard deviation, number and percentage are given as descriptive data. Shapiro Wilk's test was used to investigate the suitability of the data for normal distribution. In comparing normally distributed groups, the independent sample t-test was used for cases with two groups. The Mann-Whitney U test was used for cases with groups that did not conform to the normal distribution. For repeated measurements, the two-way repeated-measures ANOVA (One Factor Repetitive) "Two-way repeated distances ANOVA (One Factor Repetition)" test was used. Pearson Chi-Square and Pearson Exact chi-square analyzes were used in the analysis of the created cross tables. IBM SPSS Statistics 21.0) program was used in the analysis. $P<0.05$ was accepted for statistical significance.

Ethical Consideration

There was no compulsion to participate in the study. None of the pregnant women and their spouses refused to participate in the study. Informed consent was obtained from each patient included in the research, and the study protocol conforms to the ethical guidelines of the 1975 declaration of Helsinki as reflected in a priori approval by the institution's human research committee. The ethics committee decision regarding the research was taken from the institution where the research was conducted. The ethical approval number was ATADEK-2017-2.

Results

199 (66.5%) of the participants were diagnosed with GDM according to the 75-g OGTT results performed at 24 - 26 weeks of gestation. The remaining 100 (33.4%) participants were considered normal for GDM. The mean age of the participants with GDM was 33.6 ± 4.54, and the mean age of the other group was 29.5 ± 4.82. A statistically significant difference was found between the mean ages of the groups ($p<0.001$). However, no significant difference was found in the analysis of other socio-demographic characteristics that may influence eating habits (Table 1).

Table 1: Comparison of socio-demographic characteristics. Mean ± standard deviation, median, minimum, and maximum values for continuous variables, numbers, and percentages for discrete variables are given.

	Normal Pregnant (n=100)	GDM Pregnant (n=199)	P
Age of Pregnant	29.5 ± 4.82 29.0 (26.0 - 32.3)	33.6 ± 4.54 33.0 (30.0 - 36.0)	<0.001
Age of Spouse	33.0 ± 6.00 32.0 (29.0 - 35.0)	36.8 ± 7.10 35.0 (33.0 - 39.0)	<0.001
Duration of Marriage	4.65 ± 3.85 3.00 (2.00 - 5.25)	4.62 ± 3.11 4.00 (2.00 - 6.00)	0.256
Educational Status of the Pregnant			
Primary education	3 (3.00%)	9 (4.5%)	0.64
High School	38 (38.0%)	67 (33.7%)	
College / University and Above	59 (59.0%)	123 (61.8%)	
Spouse's Educational Status			
Primary Education	3 (3.00%)	10 (5.03%)	0.499
High School	19 (19.0%)	46 (23.1%)	
College / University and Above	78 (78.0%)	143 (71.8%)	
Family Type			
Nuclear Family	100 (100%)	198 (99.5%)	The Number of Samples is Insufficient. No Analysis Has Been Made.
Extended Family	0 (0%)	1 (0.503%)	
Working Hours of the Pregnant			
Daytime	76 (91.6%)	156 (91.8%)	0.413
Night or Shift	7 (8.43%)	14 (8.2%)	
Working Hours of the Spouse			
Daytime	79 (79.0%)	160 (80.4%)	0.865
Night or Shift	21 (21.0%)	39 (19.6%)	
Income Rate			
3000 TL and below	5 (5.00%)	2 (1.01%)	0.0801
3000 TL and above	95 (95.0%)	197 (99.0%)	

Of the participants diagnosed with GDM, 113 (56.8%) of them provided blood sugar regulation with diet, while insulin therapy was required in 86 (43.2%). 63.5% of the pregnant women included in the study were the first pregnancy. GDM was detected in 75.2% of those with multiparity. No significant difference between the groups in terms of the birth weight of babies was detected (p=0.407) (Table 2).

The weights of the patients and their spouses were compared before and after pregnancy. A significant difference between the groups was found in terms of initial and final weights (Table 3).

Table 2: Comparison of GDM treatment, number of pregnancies, and birth weight characteristics of the groups.

	Normal Pregnant (n=100)	GDM Pregnant (n=199)	P
Diabetes Treatment			
None	100 (100%)	0 (0%)	<0.001
Diet	0 (0%)	113 (56.8%)	
Insulin	0 (0%)	86 (43.2%)	
Number of Pregnancy			
1st pregnancy	73 (73.0%)	117 (58.8%)	<0.001
2nd pregnancy	18 (18.0%)	76 (38.2%)	
3rd pregnancy and above	9 (9.00%)	6 (3.0%)	
Birth Weight			
Up to 3.0 kilos	17 (17.0%)	43 (21.6%)	0.407
3.0-3.5	39 (39.0%)	84 (42.2%)	
3.5-4.0	36 (36.0%)	63 (31.7%)	
4 kilos or more	8 (8.00%)	9 (4.5%)	

Table 3: Comparison of the weight values of the groups according to the measurement times. Mean ± standard deviation, median, minimum, and maximum values were given as descriptive statistics.

	Normal Pregnant (n=100)	GDM Pregnant (n=199)	P
Starting Weight	64.3 ± 9.96 64.0 (58.0 - 70.0)	73.7 ± 11.6 73.0 (65.0 - 82.0)	<0.001
Final Weight	77.9 ± 10.6 76.4 (70.0 - 86.0)	86.3 ± 11.8 87.0 (77.0 - 95.0)	<0.001
p	<0.001	<0.001	
Starting Weight of the Spouse	74.5 ± 7.22 74.0 (70.0 - 79.0)	84.9 ± 9.36 84.0 (80.0 - 90.0)	<0.001
Final Weight of the Spouse	79.4 ± 7.63 79.0 (74.0 - 83.0)	85.4 ± 8.42 85.0 (80.0 - 90.0)	<0.001
p	<0.001	0.039	

Discussion

Research on the transition to fatherhood has increased in the last 20 years. The first articles on the subject were published in the mid-80s[15]. Although the perception of paternity differs between cultures, the contribution of prospective fathers to the pregnancy and birth process has increased significantly in recent years16. Yogman divided this process of change into three phases: the prenatal period, the birth period, and the postnatal period until the baby is one-year old[17]. According to the meta-analysis results of Genesoni, the most stressful period for fathers among these three periods was the pregnancy period[18]. In this transition period, fathers decide on the father image they want to have and experience psychological reorganization. The greatest difficulties faced by fathers

in this period were that they could not realize the reality of the event because they could not experience a physical change. They felt powerless because they could not control the change. Diseases such as GDM that occur during pregnancy also increase their anxiety.

In addition to genetic factors, environmental conditions and living standards are also effective in developing obesity[19]. In the analyzes performed, the effect of socioeconomic factors on weight gain during pregnancy was found[20]. It was determined that weight gain in pregnant women who did not receive high school education was higher according to IOM standards[21]. In the study of Huynh et al., it was found that pregnant women with college and higher education had less weight gain[22]. On the contrary, Abbasalizad Farhangi stated that highly educated Iranian women have more weight gain during pregnancy[23]. Thus, it can be said that socioeconomic effects have different effects in different cultures. The fact that no significant difference was found between the groups in terms of educational status, working hours, monthly income, and marriage duration of the couples we examined in our study increases the strength of our research.

Although many studies have been conducted on weight gain during pregnancy and GDM and its consequences, no article examining weight gain has been found to evaluate the physical adaptation of partners to this process. Therefore, we think that our study is the first in this field. The number of fathers participating in similar studies is below the number of fathers participating in our research. This increases the reliability of the results obtained from our study. When the weights of the participants and their spouses were compared before and after pregnancy, a significant difference was found between the groups in terms of initial and final weights. While the weight gain in the spouses of the GDM group with calorie restriction was approximately 1 kg, this increase was around 5 kg in the other group. Although both increases were statistically significant ($p<0.001$ vs. $p=0.039$), the difference between weight gains was distinct.

On the other hand, it was determined that dietary compliance was higher in the spouses of the GDM group with calorie restriction. The demand of the participants in the GDM group to change their living conditions was more accepted by the prospective fathers of the group.

In our study, GDM was found in 66.5% of the participants who were found to have risk factors for GDM in the pre-pregnancy period. This shows that genetics and obesity are determinants in the development of diabetes. In the study of Saldana et al.,

the insulin resistance of obese women was high, and it was evaluated that GDM occurs with weight gain during pregnancy[24]. The statistically significantly higher mean age of GDM patients in our study is a possible indicator that predisposing factors increase with age. In the study of MacDonald et al., in parallel with our study, it was shown that the mean age of obese pregnant with GDM was higher[25].

All but one of the 299 families participating in the study was in the nuclear family structure. Both the fact that family members who can help live far away and the need for mothers to return to work early after giving birth increased fathers' physical and emotional involvement during pregnancy and the postpartum period. The analysis of Hyssala et al. determined that the relationships of couples living in urban areas were closer and more supportive. In rural areas, the father role is more traditional[26]. The results of our analysis revealed that prospective fathers adopt the urban model.

As a result, obesity is a serious public health problem. Obesity is a chronic disease closely related to diabetes in both pregnancy and everyday life. Fighting this problem before and during pregnancy is very important for a healthy pregnancy and birth process. The role of father candidates in this process is undeniable. There is a need for comprehensive and prospective randomized studies examining the effects of pregnancy on prospective fathers.

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