A Survey on the Relationship between Ages above 35 Years and Gestational Diabetes Mellitus

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ABSTRACT

Background: The aim of this study was to determine the relationship between ages above 35 years old and gestational diabetes mellitus in Zabol.

Methods: This study was conducted in Zabol city during 2016-2017. Analyzing the data to check the validity of the hypothesis in any type of research is of particular importance and is performed nowadays in most research studies based on the data gathered from the subjects under study. Data analysis is one of the main and most important parts of any research. Raw data is analyzed using statistical software.

Results: The results of this study showed that according to the gestational diabetes mellitus score of 150 mothers, about gestational diabetes, 11 cases (7.3%) had gestational diabetes, and 132 (92.7%) others have not experienced gestational diabetes. Generally, according to the average score (1.92), there is no gestational diabetes in mothers.

Conclusion: The most important risk factors for gestational diabetes are age, obesity and familial history, respectively.

Introduction

The World Health Organization (WHO) has cited diabetes as an underlying epidemic, with increasing incidence of this disease in the world, and since 1993 has called on all countries in the world to cope with the epidemic.

According to the organization's estimation, the number of people with diabetes will increase from 135 million in 1995 to 300 million in 2025. Hence, the prevalence rate of the disease in developing countries is equivalent to 170% in advanced countries of 42%.[1]

Therefore, although diabetes is now considered as a problem in advanced countries, the main effect of this disease is the reduction of life expectancy in developing countries.[2]

Gestational diabetes increases blood glucose that can be initiated or diagnosed for the first time in pregnancy.[2]

Table 1. Frequency distribution of mothers based on age

Age	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
18-23 years old	0	0	51	34.0
24-29 years old	0	0	30	20.0
30-35 years old	2	1.3	39	26.0
36-41 years old	123	82.0	17	11.3
42-47 years old	25	16.7	13	8.7
Total	150	100	150	100

It is common in pregnancy and associated with maternal and fetal causes. Also, women at higher risk of developing Type 2 Diabetes are more likely to have gestational diabetes. However, the risk and timing of the onset of this disease are quite variable.[3]

This disease increases with the prevalence of obesity in women and with the rise in age of birth.[4] About 30 percent of pregnant women are obese and at risk of side effects such as maternal and cesarean lesions.[5] Gestational diabetes is associated with increased risk for mother and baby during pregnancy and later stages of life.[6]

Its prevalence in studies conducted in different cities of Iran from 1991 and 2007 was reported to vary from 1.3 to 8.9%.[7]

The most important maternal complications of gestational diabetes are the higher risk of preeclampsia and eclampsia, labor induced duct injury Macrosomia, Polyhydroaminosis and the prevalence of infections during pregnancy. Perinatal complications include Macrosomia characterized by birth defects and dystocia, neonatal hypoglycemia, hyperbilirubinemia, and respiratory distress syndrome.[8] The aim of this study was to determine the relationship between ages above 35 years old and gestational diabetes mellitus in Zabol.

Materials and Methods

This study was conducted in Zabol city during 2016-2017. Analyzing the data to check the validity of the hypothesis in any type of research is of particular importance which is nowadays performed in most research studies based on the information gathered from the subject under study. Data analysis is one of the main and most important parts of the research. Raw data is analyzed using statistical software and is then handled by the users after processing.

As indicated in the research method, a questionnaire was used to collect the data needed for this research. Both descriptive and inferential statistics were used to analyze the data.

Results

The clinical characteristics of the study population are presented in Tables 1-6.

Table 2. Frequency distribution of mothers' deliveries

Education	Experimental		Control	
	Frequency	Percentage	Frequency	Percentage
Once	10	6.7	51	34.0
Twice	8	5.3	30	20.0
Three times	26	17.3	39	26.0
Four times	27	18.0	17	11.3
Five times	27	18.0	9	6.0
Six times	18	12.0	3	2.0
Seven times	13	8.7	1	0.
Eight times	13	8.7	0	0
Nine times	4	2.7	0	0
Ten times	2	1.3	0	0
Eleven times	2	1.3	0	0
Total	150	100	150	100

Table 3. Frequency distribution of mothers' education

Education	Experimental		Control	
	Frequency	Percentage	Frequency	Percentage
Illiterate	24	16.0	18	12.0
Primary	59	39.3	31	20.7
Secondary	48	32.0	77	51.3
Diploma	11	7.3	5	3.3
University	8	5.3	19	12.7
Total	150	100	150	100

According to Table 1, from among 150 mothers, 2 (1.3%) patients aged 30 to 35 years old, 123 (82.0%) were 36 to 41 years old and 25 (16.7%) were 42 to 47 years old.

Frequency distribution of mothers according to the number of deliveries:

According to Table 2 from 150 mothers, 10 (6.7%) were pregnant once, 8 (3.5%) twice, 26 (17.3%) three times, 27 (18.0%), Four times, 27 (18.0%) five times, 18 (12.0%) six times, 13 patients (7.7%) seven times, 13 (8.7%), four (7.2%) nine times, two (1.3%) ten times and two (1.3%) eleven times.

According to Table 4, from among of 150 mothers, 119 (79.3%) experienced abortion once, 17 (11.3%) twice, 7 (4.7%) three times, 2 (1.3%) four times, and one individual (0.7%) experienced five abortions.

Gestational diabetes mellitus: Regarding the gestational diabetes mellitus score, out of 150 pregnant women who had been diagnosed by having gestational diabetes mellitus, 11 cases (7.3%) had gestational diabetes, and 139 (92.7%) had no gestational diabetes (Table 5). Generally speaking, according to the average score (1.9%), there was no gestational diabetes in mothers (Table 6).

Discussion

In the study of Rahimi et al., the prevalence of gestational diabetes was 43.3%. Diabetic mothers were older and more obese than non-diabetic mothers and had previous history of gestational diabetes - a family history of diabetes, history of abortion, history of macrosomia and history of stillbirth more than non-diabetic mothers. In multivariate analysis; age, Obesity, Family history of diabetes, First pregnancy, Pregnancy history and history of abortion were factors those significantly increased the chance of developing gestational diabetes.[9]

According to various reports, the prevalence of diabetes in Turkey, Sri Lanka, Japan, China, Canada and Italy is 1.23%, 5.5%, 2.9%, 2.3%, 1.74%, and 8.74%, respectively. In Iran, the prevalence of diabetes in Tehran, Uremia, Mashhad and Shahrood has been reported to be 4.5%, 1.7%, 2.7% and 8.4%, respectively.[10, 11]

In a study of agriculture and colleagues, the results showed that in the age group of 35-40 years old and above 4 years, 3.8% and 2.27% of cases were eclampsia. An early separation of 1.8 and 4.2 Percentage was seen. This amount in the control group was 1.28%, 0.5%, 0.2% and 1%; respectively.

Table 4. Frequency distribution of mothers' abortion history

Abortion history	Experimental		Control	
	Frequency	Percentage	Frequency	Percentage
Once	119	79.3	131	87.3
Twice	17	11.3	13	8.7
Three times	7	4.7	6	4.0
Four times	2	1.3	0	0
Five times	1	0.7	0	0
Total	150	100	150	100

Table 5. Frequency distribution of gestational diabetes mothers

Gestational diabetes	Experimental		Control	
	Frequency	Percentage	Frequency	Percentage
Positive	11	7.3	3	0.2
Negative	139	92.7	147	0.98
Total	150	100	150	100

Embryonic and neonatal complications in the study group included intrauterine death (9.6% and 14%), macrosomia (4% - 1.9%), and Apacer less than 7 minutes (3.1% and 2.3%).[3]

Seyed Miri et al., reported the highest prevalence of gestational diabetes in a study in Karaj with a sample of 668 cases along with prevalence rate of 18.6% [17] and the lowest prevalence of gestational diabetes was found in the study of Jalilian et al. (2002) in Kermanshah, with a sample of 504 people, among them only 4 individuals (0.7%) had gestational diabetes, and all four had a BMI greater than 26 as well.[13]

Goli et al., studied the risk factors of gestational diabetes mellitus in pregnant women referred to health centers in Isfahan and showed that from among of 2014 women, 77 women with gestational diabetes were pregnant (3.8%). There was a significant relationship between gestational diabetes mellitus with age, BMI, pregnancy, and history of familial diabetes.[14]

The study of Jafari-Shobeiri et al., revealed that Twenty-four of 1011 papers were quite relevant to the objectives of the review, so, they were included. The mean age of the participants was 29.43 ± 4.97 years and the prevalence of GDM was 3.41% (the highest and the lowest prevalence rates were 18.6% and 1.3% respectively). Among the influential factors mentioned in the literature, potential causes of GDM are gestational age, history of gestational diabetes, family history of diabetes, body mass index, abortions and parity, and history of macrosomia.[15]

The study of Hossein-Nezhad et al., was focused on 114 women (4.7%; 95% confidence interval [CI], 3.9-5.6%) who had GDM. Women with GDM had a significantly higher parity and body mass index than non-diabetic women. Women with GDM were also more likely to have a family history of diabetes and a history of poor obstetric outcome. From among the 114 women, 27 (23.6%) were younger than 25 years old, and 16 (14.0%) had no recognizable risk factor for diabetes. The odds ratio (OR) for cesarean section (OR, 2.28; P = 0.0002), macrosomia (OR, 1.93; P = 0.0374), neonatal hypoglycemia (OR, 3.2; P = 0.011) and hypocalcemia (OR, 3.045; P = 0.0195), and still birth (OR, 4.8; P = 0.003) were all significantly higher in women with GDM than non-GDM controls. [16]

The study of Zokaie showed that diabetic mothers were older and more obese than non-diabetic mothers. In the logistic regression, variables such as familial history of diabetes in first-degree relatives, history of gestational diabetes, age ≥ 30 years, history of stillbirth, history of macrosomia, and body mass index above 30 were considered as the most important independent risk factors for gestational diabetes respectively. However variables such as smoking, blood pressure, and history of infant death showed no statistical significant difference between the two groups.[17]

Table 6. Descriptive statistics of gestational diabetes score.

Group	Mean	±SD	Median	Mode	Skewness	Kurtosis	Minimum	Maximum	Number
Experimental	92.1	0.261	2	2	-3.307	9.054	1	2	150
Control	98.1	0.141	2	2	-6.927	46.599	1	2	150

The study of Moradi et al., was focused on prevalence of gestational diabetes mellitus in Rafsanjan and a comparison of different criteria. Two hundred ninety pregnant women with a mean ± SD age of 27.72 ± 5.091 years participated in the study. The mean ± SD (Fasting blood sugar) FBS shows that blood glucose one hour and two hours after ingesting 75g of glucose were 82.48 ± 9.41, 146.86 ± 34.22 and 114.21 ± 27.79 mg/ dl, respectively. Based on the criteria of the ADA, 9.3% (n = 27) of the admitted patients suffered from GDM. For the IADPSG and the WHO, those numbers were 31% (n = 90) and 15.2% (n = 44), respectively.[18]

The study of Garshasbi et al., evaluated the prevalence of gestational diabetes mellitus (GDM) and its risk factors in Tehran. The results showed that the glucose challenge test was positive in 38.1% of cases .The prevalence of GDM for the whole cohort was 6.8%. About 78.6% of our population were at medium or high risk for GDM and, therefore, would have been screened. The rate of GDM was significantly higher in women with a positive family history of diabetes, positive history of GDM, older age, multiparity, pre-pregnancy obesity, and greater weight gain during pregnancy, history of infertility, chronic hypertension, history of stillbirth pregnancies and abortion. After logistic regression analysis, GDM diagnosis was significantly correlated with age (P < 0.001), pre-pregnancy BMI (P = 0.005), family history of diabetes (P < 0.001), history of GDM (P = 0.002), chronic hypertension (P < 0.001) and glucosuria during current pregnancy (P < 0.001). [19]

In this study the prevalence of gestational diabetes mellitus was relatively high due to the high prevalence of precautionary measures across the country.

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Conflict of Interests
Authors have no conflict of interests.

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