

Original Research Article

Factors Associated with Gestational Diabetes Mellitus in Babylon , Iraq During The Year 2014

Hasan Alwan Baiee^{1*} Maha Fliah² Dhay Abd Alkareem² Sara Hamid²
Ayaat Salim²

¹College of Medicine, University of Babylon, Hilla, IRAQ

²Medical and Health Techniques College, Kufa, Najaf, IRAQ

*E-mail: hassanbae@yahoo.com

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Abstract

Gestational diabetes has serious consequences on mothers and their children. Gestational diabetes is an increasing public health problem in developing countries including Iraq , the etiology of this health problem is not well understood .

The objective of this study is to identify some factors associated with gestational diabetes in Babylon province

This was a case control study included 85 diagnosed diabetic pregnant women who were selected randomly from patients attending three hospitals in Babylon in addition to three primary health care centers as cases while 85 healthy women selected randomly from women attending maternal child health units as a control group proved to be non-diabetics, the period of study extended from July, 2014 through January, 2015 .

Data was collected using a semi structured questionnaire to assess some risk factors associated with gestational diabetes.

Our study showed that the main factors that associated significantly with gestational diabetes ($p<0.05$) were maternal age after 30 years, smoking ,living in urban regions increase weight of baby during delivery (Odds Ratio =3.322), delivery by cesarean section Odds ratio= 2.115). There was also a significant association between family history of diabetes and having gestational diabetes (Odds Ratio =1.64)but here were no significant association between gestational diabetes and the following variable ($p>0.05$) ;abortions and family history of obesity.

In conclusion the study showed significant associations between gestational diabetes and progressive age of pregnant woman and smoking .Delivery by cesarean section and the delivery of high weight baby were significantly correlated with gestational diabetes.

Key words : Gestational Diabetes Mellitus, associated factors, Babylon, Iraq

العوامل المرتبطة بسكر الحمل في محافظة بابل - العراق لعام ٢٠١٤

الخلاصة

سكر الحمل يؤدي الى عواقب على الامهات واطفالهن, تتزايد هذه المشكلة في الدول النامية ومنها العراق , ان الاسباب الحقيقية لهذه الحالة لاتزال غير واضحة, الهدف من هذه الدراسة هو معرفة بعض العوامل المرتبطة بسكر الحمل للنساء في مدينة الحلة - محافظة بابل . ان هذه الدراسة هي دراسة للحالات والشواهد تم دراسة ٨٥ حالة اصابة بسكر الحمل اخترن عشوائيا بعد التأكد من التشخيص وهن من المراجعات لثلاث مستشفيات الولادة وثلاث مراكز رعاية صحية اولية في المحافظة , واختيرت عشوائيا ٨٥ امرأة من غير المصابات والمراجعات لوحداث رعاية الام والطفل كشواهد (عينة ضابطة) بعد التأكد من عدم اصابتهن بسكر الحمل. اجريت هذه الدراسة للمدة من بداية شهر تموز ٢٠١٤ الى نهاية كانون الثاني ٢٠١٥.جمعت البيانات من خلال ورقة استبانة تضمنت معلومات عن عوامل الخطورة المصاحبة لسكر الحمل.

أظهرت النتائج ان وجود علاقة احصائية مهمة بين الاصابة بسكر الحمل والعوامل الاتية:عمر المرأة اثناء الحمل لأكثر من ٣٠ سنة وجود تاريخ عائلي موجب للسكّر , والتدخين , ولادة طفل وزنه أكثر من الطبيعي , الولادة بعملية القيصرية, لم تكن هناك علاقةدالة بين الإجهادات ووجود تاريخ عائلي موجب للسمنة وسكر الحمل.نستنتج من هذه الدراسة وجود علاقة إحصائية مهمة بين سكر الحمل وتقدم العمر أثناء الحملووجود تاريخ عائلي للسكّر والولادة بعمليةالقيصرية والتدخين وولادة أطفال زاندي الوزن وسكر الحمل.

الكلمات المفتاحية: سكر الحمل, العوامل المرتبطة , بابل, العراق.

Introduction

Gestational diabetes mellitus(GDM) is defined as glucose intolerance with onset or first recognition during pregnancy[1]. The diagnosis of GDM represents detection of a chronic metabolic abnormality during pregnancy [2], metabolic adaptations are necessary to ensure the growth and development of the fetus and to meet the altered demands of the mother during pregnancy. Gestational diabetes mellitus is a form of diabetes which affects the mother in late pregnancy[3].Serious complications such as hypertension and stroke are correlated to GDM [4].

Maternal diabetes can also affect the fetus leading to fetal macrosomia[3,5,6].

Gestational diabetes is only a temporary phase; it disappears after pregnancy[7].

Fetal and newborn risks include macrosomia, birth injuries, hyperbilirubinemia, hypoglycemia, transient tachypnea and respiratory distress syndrome. Risks for mothers include preeclampsia, cesarean delivery, and an increased risk of developing type 2 diabetes later in life[8-11]. Children of women with previous GDM also have an increased risk of developing childhood obesity and type 2 diabetes.

Increasing rates of obesity nowadays have led to more cases of undiagnosed type 2 diabetes in women of childbearing age and a rise in the number of pregnant women with undiagnosed type 2 diabetes[12,13].

Women with gestational diabetes can have favorable pregnancy outcome, if, they follow a proper management program from their health care providers. The main aim of treatment is to keep

blood glucose within normal limit. It includes health and suitable dietary regime, proper physical activity, glucose monitoring and insulin injections if needed, the proper management of GDM reduces the risk of a caesarean section birth that high weight babies(macrosomia) may require[14].

Subjects and Methods

This was a Case control stud carried out in three hospitals in Babylon province (Babylon maternity hospital , AL-Qasim-General Hospital and AL-Hashmia and three primary health care centers in Babylon provincefrom the beginning of July,2014 through the end of January 2015.

Approval of ethical committee of Babylon medical college was taken as well as the acceptance of Babylon Health directorate . Informed consents of each participant was also obtained after explaining the aims of the study.

Pilot project was conducted on five patients (gestational diabetics) and five control women (healthy) in order to assess the time needed to collect data from each participant ,and to identify the main problems that may face the researchers during conducting this study

Eighty five pregnant patients (after 24 to 36 weeks of gestation) patients proved to have diabetes during pregnancy (the diagnosis was confirmed during the current pregnancy) were selected randomly(by systematic random technique) from patients attending or admitted to AL-Hilla Maternity hospital, AL-Qasim general hospital and Al Hashmia general hospital and three primary health care centers(Al-shawei health care center,Al-hadihealth care

center, Shaheed al-Islam health care center) in Babylon province during the period of the study, diagnosis of cases depended on the repeated assessment of blood glucose done by the health care providers.

Similar number of pregnant women (24-36 weeks of gestation) who attended the outpatient clinics and the maternal and child and maternity health service unit were selected in systematic way and invited to participate in the study after explaining its aim and explaining the importance of screening for GDM, after obtaining the approval and the informed written consent each woman in the control group was interviewed by one of the research team and was asked to drink 250 ml of water contain 50mg of glucose powder after one hour from drinking the glucose solution, a sample of two milliliters of venous blood was taken to assess the blood glucose level, the cutoff level was 140 mg/dL (each woman with post glucose level less than this cutoff considered non-diabetic, healthy control)[15].

The information was collected from both groups using special form of questionnaire that pertains demographic and socio economic characteristics of participants including: (age, place of residence, level of education, family history of diabetes, previous gestational diabetes, number of pregnancies, number of live births, previous Caesarean births, complications during pregnancy, birth of previous child weighed more 4000 grams, Previous abortions, family history of obesity, tobacco smoking).

Tobacco smoking was assessed by asking questions about current smoking (regular smoking) or she mention that her husband is smokers for at least two years (passive smoker). Those women who quitted

smoking for the last three years was considered non-smokers.

Statistical analysis was done by using SPSS version 17 to describe data intables (frequency and percentage). Inferential statistic was used to calculate : Chi square test and Odds Ratios (OR) to find the association between the dependent variable (GDM) and other independent variables (previous history of diabetes, smoking, family history of diabetes, history of macrosomic child, age of pregnancy. P value < 0.05 used as statistically significant level.

Results

Table (1) shows the distribution of cases and control according to age in this table women with gestational diabetes are older than the woman in control group .this difference is statistically significant ($p=0.003$), the same table shows that most cases are living in urban regions Odds Ratio (3.898) C.I (2.04 -7.45) $p=0.001$.

Table (2) shows that still births and high weight of babies as well as deliveries in cesarean sections are significantly linked with gestational diabetes, crude Odds Ratios (1.875, 3.322, 2.115) respectively. Abortions are not associated significantly with gestational diabetes odds ratio (0,005).

Table (3) shows that the proportion of both current cigarette smoking and passive smoking are higher among women with gestational diabetes as compared to the healthy control group, this difference is statistically significant ($P=0,04$).

Negative finding is found regarding the family history of obesity ($p=0.763$).

The odds ratio of positive family history of diabetes is (1.64) 44.7% of women with gestational diabetes have positive family history of type2 diabetes as compared to the control group.

Table1: Distribution of cases and control groups by age and place of residence

		Case N=85		Control N=85		Odds ratio	Confidence interval	p.value
		No.	%	No.	%			
Age group (in year)	<20	9.4	11	30.6	36	3.898	9.5-20.4-	0.003
	21-30	41.2	48	28.2	34			
	31-40	47.1	56	41.2	49			
	>40	2.4	3	.	.			
Residence	Urban	74.1	88	42.4	50	3.898	9.5-20.4-	0.001
	Rural	25.9	31	57.6	68			

Table 2 : Odds Ratios of complications associated with gestational diabetes

		Case n=85		Control n=85		Odds ratio	Confidence interval	P.value
		No.	%	No.	%			
Abortion	+ve	24.7	29	27.1	32	0.885	0.445-1.758	0.00
	-ve	75.3	89	72.9	87			
Still births	+ve	20	24	11.8	14	1.875	0.804-4.375	0.142
	-ve	78	94	88.2	106			
Weight of baby 4kg and more Macrosomic	+ve	28.2	34	10.6	13	3.322	1.439-7.672	0.04
	-ve	71.8	87	89.4	109			
Cesarean section	+ve	48.2	58	30.6	37	2.115	1.129-3.961	0.019
	-ve	51.8	62	69.4	84			
		Case	n=85	Control	n=85	Odds ratio	Confidence interval	p.value
		No.	%	No.	%			
Abortion	+ve	24.7	29	27.1	32	0.885	0.445-1.758	0.00
	-ve	75.3	89	72.9	87			

Still births	+ve	20	17	11.8	10	1.875	0.804-4.375	0.142
	-ve	78	80	88.2	90			
Weight of baby 4kg and more Macrosomic	+ve	28.2	24	10.6 ^a		3.322	1.439-7.672	0.04
	-ve	71.8 ¹¹		89.4 ¹¹				
Cesarean section	+ve	48.2 ¹¹		30.6	26	2.115	1.129-3.961	0.019
	-ve	51.8	44	69.4	59			

Table 3: Odds Ratios of some risk factors associated with gestational diabetes

		Case N=85		Control N=85		Odds ratio	Confidence interval	p.value
		%	No .	%	No .			
Family history of obesity	+ve	30.6	26	28.2	24	1.646	0.579-2.168	0.736
	-ve	69.4	59	71.8	61			
Family history of diabetes	+ve	44.7	38	32.9	28	1.646	0.883-3.076	0.016
	-ve	55.3	47	67.1	57			
Cigarette smoking	Smoker	4.7	4	2.4	2	3.322	1.439-7.672	0.04
	Non-smoker	80	68	85.9	73			
	Passive smoker	15.3	13	10	11.8			

Discussion

Iraq was advancing through the epidemiological transition from infectious disease to chronic and degenerative disease[16,17].

Our study showed that progressive age of pregnant women is associated with gestational diabetes mellitus this finding is similar to the finding reported by

another study carried out by Hameed N in Baghdad teaching hospital during 2011 study[18].

Our study showed that macrosomia was common among women with gestational diabetes this finding agrees with findings of other studies [19,20]. This may reflect the high proportion of cesarean

section deliveries among women with gestational diabetes.

This study shows that there is an association between family history of diabetes, and gestational diabetes, this findings goes with the findings of others [20].

Obesity is a common problem in our society[21] there is strong relationship between being overweight or obese and family history of diabetes reflecting the importance of genetic factor in developing of this problem [20], evidences from different researches confirmed the relationship between diabetes mellitus type 2 and increasing body weight and obesity [21].

Still birth rate is common among gestational diabetic pregnant women as compared with non-diabetic control groups , still birth is two times more likely to occur among gestational diabetic women as compared with non-diabetics, still births proportion was found to be high among women with diabetes in a study carried in babol,northern Iran [22], similar finding was reported by researchers from England[23].

Negative association was detected in this study between gestational diabetes and repeated abortions this finding disagreed with the finding of other study conducted in Saudi Arabia[24].

In this study cesarean sections are common among gestational diabetes this finding may be explain by the increase of macrosomia among diabetic women this finding is in line with report of other local study carried out in Iraqi teaching hospitals during the year 2011 [24],the current study shows that women living in Urban residence are exposed to GDM as compared with women living in Rural residence this finding is similar to the finding of Wally RH who found over all prevalence to be higher in urban women versus in suburban and rural women[25].

The current study reveals that there is a significant association between tobacco smoking (current maternal and passive

smoking) and GDM, this finding goes in line with the report of other researchers[26]but disagree with the finding of other studies[27,28]. Tobacco smoking is linked with insulin resistance and hyperinsulinemia outside pregnancy as proved by many studies [39,30]. In this study there is also a statistical significant association between residence and gestational diabetes, urban dwellers are significantly affected by gestational diabetes,this may be explained by the stressful pressure associated with dwelling in urban regions as compare to the rural regions,many studies showed that living under stressful pressure lead to chronic hyperglycemia[19].

Conclusion

Age of pregnant women and living in urban regions, positive family history of diabetes, tobacco smoking are significant independent factors associated with gestational diabetes as high rates of macrosomia and delivery with cesarean sections were associated significantly with gestational diabetes mellitus.

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