Diabetes during Labour: Types, Mode of Delivery and Fetal Outcome in Erbil Maternity Teaching Hospital.

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Abstract

A field study on 54 pregnant women during labor with pre gestational and gestational diabetes in Erbil Maternity Teaching Hospital ,Erbil city , Kurdistan region Iraq from 1st of January to the 1st of March 2005 was carried out to determine the types of diabetes, mode of delivery and neonatal out come . Total deliveries in this period were 2891, making the rate of diabetes during labor 1.9%. Mean maternal age was33.65±5.35 years, mean maternal weight was 79.50±13.5 kg, 3.7% of patients were primigraivid while 57.41 % were grandmultiparus.63% of diabetic patients in our study were Gestational diabetes while 37% were pregestational diabetes (Type 1 and Type 2 Diabetes).There was no statistically significant correlations between the types of diabetes and maternal age, weight, and parity.61.1% of the patients delivered by Caesarean Section (Emergency and Elective) while 29.6% of cases delivered spontaneously vaginally .The most common indication for Caesarean Section was Cephalo pelvic Disproportion .The perinatal mortality in the study group was 6 (2 macerated stillbirth, 2 fresh stillbirth and 2 early neonatal deaths), there were 5cases (9.2%) of congenital fetal malformations (4 congenital heart disease and one case of club foot (all were newborns of pregestational diabetic mothers).

Keywords: Gestational diabetes, pregestational diabetes, spontaneous vaginal delivery, cephalopelvic disproportion, perinatal, congenital fetal malformations, congenital heart disease.

Introduction

Diabetes Mellitus (D.M) is a metabolic disorder characterized by hyperglycemia resulting from deficiency of pancreatic insulin production or impaired effect of insulin at cellular level [1].

During pregnancy the placenta secrets substances that have an anti –insulin action, including human placenta lactogen (hPL) and Cortisol. If the maternal β islets cells are unable to produce the additional insulin required to counteract this effect, the woman will develop hyperglycemia {Gestational Diabetes Mellitus (GDM)}, between 1.5 and 2.5 % of pregnant women develop glucose intolerance during pregnancy [2].

The threshold recommended by WHO to define impaired glucose tolerance (IGT) are (i) Fasting glucose ≤ 7.8mmol /L. and (ii)2 hours glucose ≥ 8mmol / L and ≤ 11.0mmol / L .Diabetes Mellitus is defined if : (i) Fasting glucose > 7.8mmol/L and or (ii) 2h glucose > 11mm/L .It can thus be seen that there is a continuum between normality , IGT and D.M [3].

Diagnosis

-Patients with type 1 diabetes are typically diagnosed during episodes of hyperglycemia, ketosis, and dehydration; this occurs most commonly in childhood or adolescence, before pregnancy.

-Diagnosing type 2 is very difficult during pregnancy because sever forms because sever forms of GDM have similar clinical characteristics .On the other hand, it is not unusual for women tentatively diagnosed with GDM in early pregnancy to be found

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to have overt diabetes after Purperium[4] .
The American Diabetes Association 2002 diagnostic criteria for diabetes mellitus, of which only one of the following must be met, are as follows:
-Symptoms of diabetes and a casual plasma glucose level of greater than 200mg/dl (11.1mmol/L): casual is defined as any time of the day without regard to time since the patient's last meal. The classic symptoms of diabetes include polyuria, polydipsia, and unexplained weight loss.
-Fasting plasma glucose level of greater than 200mg/dl
-Two-hour plasma glucose level greater than 200mg/dl during a 75-g, oral glucose test [5].
The National Diabetes Data groups Classification are:
Type I Insulin Dependent Diabetes.
Type II Non insulin Dependent.
Type III Gestational Diabetes.
Type IV Impaired glucose tolerance [1].

Management:
1) Prepregnancy treatment of women with overt preexisting diabetes: if a reduction in diabetes-associated neonatal morbidity is to be achieved, council the patient before conception and perform a medical risk assessment in all women with overt diabetes and those with history of GDM during previous pregnancy [6]. The key feature of an effective diabetes management program is to perform:
a) Fasting whole blood glucose level less than 95mg/dl (5.3mmol/L).
b) One hour postprandial whole blood glucose level less than 140mg/dl (7.8mmol/L) [7].
c) Dietary therapy.
According to the American Diabetes Association report from 2002, carbohydrates should account for no more than 50% of the diet, with protein and fats equally account for the remainder [8].
2) Management of Gestational diabetic patients:
a) Provide nutritional counseling and dietary adjustment, gestational diabetes can be controlled by diet alone.
b) Monitor fasting and 2-hour postprandial glucose values.
c) Give insulin if fasting glucose values are greater than 105mg / dl and 2-hours postprandial values are greater than 120mg / dl [9].
mothers with diabetes are more prone to preterm labour ,miscarriage , pre-eclampsia ,urinary tract infection ,Polyhydramnios,candidal vaginal infection ,increased Perinatal mortality (20-100 / 1000) also increased incidence of congenital malformation [2].

Diabetic women are more likely to have overweight babies so the risk of Caesarean Section is likely to be increased [10]. Infants of mothers with preexisting diabetes experience double the risk of serious injury at birth, triple the likelihood of cesarean section and quadruple the incidence of newborn intensive care unit admission [11].
There is increasing evidence that good control of diabetes around the time of conception and the first weeks after , reduces the incidence of congenital abnormalities while good control throughout pregnancy reduces many of the complications but has little effect on Macrosomia (approximately 30%) [12].
In principle, provided the pregnancy has gone well, management would attempt to achieve a vaginal delivery between 38-40 weeks gestation.

The development of Macrosomia or maternal complications such as pre-eclampsia together with failed rate of induction means that the Caesarean section rate amongst diabetic women may be as high as 50% [13].

Patients and Methods

A Field research to determine the types, mode of delivery and fetal outcome in Diabetic patients during labour was carried out in the period from 1st of January to the 1st of March 2005, at labour room in Erbil Maternity Hospital, Erbil city, Kurdistan region, North of Iraq.

Cases included either prepregnancy diabetic patients (Type 1 and Type 2 Diabetes) who were admitted to the labour room for induction of labour or Elective Caesarean section and a newly diagnosed cases of diabetes during labour ,where most of them had no any Antenatal care examination and were admitted to the hospital for purpose of delivery .Suspicious of diabetes was made by having history of polyuria and polydipsia (although they are some times regarded as a common symptoms during pregnancy), history of recurrent miscarriage, stillbirth, previous macrocosmic newborn and family history of D.M, and on clinical estimation of the fetal weight being macrosomic (fetal weight more than 4 kg) or failure to progress during labour due to Cephalo Pelvic Disproportion (C.P.D) and at that situations random blood sugar was estimated from venous whole blood sampling in the laboratory department in Erbil Maternity Teaching Hospital, and the results were >200mg/ dl, Other causes for CPD were not included in our study .

The newly diagnosed cases during labour either delivered vaginally or by Emergency C.Section and followed up after puerperium by GTT,patients with abnormal results were classified as frank diabetes (Type 2) ,and those with normal GTT classified as gestational diabetes .Newborn babies delivered vaginally or abdominally, were resuscitated, weighed and examined in the labor room then brought to the Neonatal I.C.U.

Newborns with congenital heart disease were diagnosed in the N.I.C.U, where further management was carried out.

Data analyzed using frequency and cross tabulation showing the results in tables.

Relation between types of diabetes and maternal age, weight and parity was done using Eta test.

Eta is a measure of association that ranges from 0 to 1, with 0 indicating no association between the row and column variables and values close to 1 indicating a high degree of association. Eta is appropriate for relation between a dependent variables (measurable) and Independent variables (immeasurable variables).

Results

Demographic characteristics of the study population summarized in Table (1), mean maternal age was 33.65±5.35 years and mean maternal weight was 79.50±13.5 kg .There were 2 cases with a gestational age of 28-32 weeks both were intrauterine fetal deaths .3.7% of cases were primigriavid, 38.89% were multiparus and 57.41% were grandmultiparus ladies .7 patients gave history of recurrent miscarriages and 8 patients had history of intrauterine fetal deaths.

Table (1): Characteristics of study population

	Rang	Mean	S.D
Maternal age (year)	22-45	33.65	5.35
maternal weight(Kg)	60-120	79.50	13.5
gestational age (weeks)	28-32 33-37 ≥38	2 (3.7 %) 15 (27.9%) 37(68.5%)	
	Total	54 (100%)	
parity	P0(primigraivid) P1-4(multiparious 5-10(grandmultiparus)	2 (3.7 %) 21 (38.89%) 31 (57.41%)	
	Total	54 (100%)	
history of recurrent miscarriages(≥3 miscarriages)	7 (13 %)		
history of stillbirths	8 (15 %)		

Table 2, 3 and 4 shows the relation between maternal age, weight and parity with the types of diabetes {Gestational Diabetes (G.D), Type 1 D.M and Type 2 D.M}, although the number of diabetic patients increased with the increased age, weight and parity but there was no statistically significant relations between the three types of diabetes and maternal weight, age and parity.

Table (5)shows types of diabetes in the study population ,8cases (14.8%) were type 1 Diabetes (Insulin dependent) , 12 cases(22.2%) were type 2 Diabetes (Non Insulin Dependent Diabetes) , while 34 cases (63%) were gestational diabetes ,these were classified after checking the blood sugar for newly diagnosed diabetic patients during labor 6 weeks after delivery.

Table (2): Relation of maternal age with Types of Diabetes

Maternal age (year)		DM G.D	DM Type 1 DM	DM Type 2 DM	Eta test	Decision
22-30	7	2	2			
30-40	23	4	6		0.279	NS
>=40	4	2	4			
Total		8	12			

Table (3): Relation of maternal weight with types of Diabetes.

Maternal weight (years)		DM GD	DM Type 1 DM	DM Type 2 DM	Total 11	Eta test 0.148
60-69	7	3	1			
70-79	9	1	3	13		Non significant
80-89	10	2	5	17		
>=90	8	2	3	13		
Total	34	8	12	54		

Table (6) summarizes the mode of delivery of the diabetic patients in the study sample , 33.3% delivered by emergency Caesarean section while 27.8% by elective Caesarean section .29.6% delivered vaginally spontaneously , only 9.3% undergo successful induction of labor for cases diagnosed previously being diabetic and planed for termination of pregnancy by induction of labour. .

Indications for Caesarean section(both emergency and elective) is shown in Table (7) .Failure to progress due to Cephalo pelvic disproportion constituted the most indication(33.3%) ,previous Caesarean section scar , failure of induction of labor, malpresentation, PIH+ Eclampsia , primary infertility and history of five intrauterine fetal deaths were the next indications in descending order .

Table (8) summarizes neonatal outcome where 48 newborn babies were alive and 4 were stillborn (2 were macerated and 2 were fresh stillbirths) and 2 newborn died at Neonatal ICU few days after admission(early new natal deaths) .There were 5cases of congenital anomalies all their mothers with pregestational diabetes.

Table (4): Relation of parity with types of Diabetes.

Parity	Types of D.M				
	GD	Type 1 DM	Type 2 DM	Total 2	Eta test= 0.335 Non significant
	0	2	0	0	
	1--4	16	1	4	21
	5--10	16	7	8	31
	34	8	12	54	

Table (5): Types of Diabetes in the study population .

Types of Diabetes	
Type I Diabetes	8 (14.8%)
Type 2 Diabetes	12(22.2%)
Gestational Diabetes	34(63%)
Total	54(100%)

Table (6): Mode of delivery of the study Population

	Mode of delivery	No.
1	Elective Caesarean Section	15 (27.8 %)
2	Emergency Caesarean Section	18 (33.3 %)
3	Spontaneous vaginal delivery	16 (29.6 %)
4	Induction of labor	5 (9.3 %)
Total		54 (100%)

Table (7): Indications for Caesarean Section in the study population

	Indications	No. (%)
1	Failure to progress due to CPD	15 (54.54 %)
2	Previous scar + D.M	7 (21.21 %)
3	Failure of induction of labour	3 (9.09 %)
4	Malpresentation	3 (9.09 %)
5	PIH+ Eclampsia	2 (6.06 %)
6	Primary infertility	2 (6.06 %)
7	History of 5 intrauterine deaths	1 (3.03%)
	Total	* 33(100)

*33 delivered by Caesarean section and 21 by Vaginal delivery .

Table (8): Neonatal outcome

		range	Mean
	Weight (kg)	1.6-5.3	3.77± 0.75
1	Alive	48	
2	Still birth	4	(2 macerated stillbirth and 2 fresh stillbirth)
3	Early neonatal death*	2	
4	*Congenital malformation	5	Congenital heart disease(4) club foot(1)

*1st week of life (after admission to Neonatal ICU).
*All newborns of pregestational diabetic mothers (Type 1 and 2)

Discussion

Our study on 54 diabetic pregnant women delivered in Erbil Maternity Hospital has demonstrated that obese or over weight pregnant are at increased risk of both Type 2 D.M and gestational diabetes, so the type of diabetes has no relation to maternal weight although increased maternal weight was more prominent in diabetic patient(3) .

This was in agreement with the study done by Cypryk, et al, at Poland, who concluded from his study that overweight and obesity are both risk factors of gestational diabetes, delivery of newborn with macrosomy features and overt diabetes mellitus later in life [14].

Increasing maternal age was a risk factor for all types of diabetes (Table 2), this was in agreement to a study done by Donald W.M. et al, who concluded that most people with type 2DM present in middle or old age [15] and in the Nurses Health Study Cohort in the USA, where they demonstrated that increasing age is associated with increased prevalence of GDM [16].

Increased parity was related to increase rate of all types of diabetes (Table 4), this may be related to increased maternal age.

Our study revealed history of recurrent miscarriages and stillbirths in 13% and 15% of cases respectively, this was in agreement with a retrospective study done

by Sutherland HW and Fisher PM.where 97 cases in their study had history of stillbirths and 115 women with history of 2 or more spontaneous abortions tested in subsequent pregnancy a caused association is postulated between inadequately explained stillbirth and recurrent abortion and abnormal intravenous glucose test (IVGT) [17].

Sixty three percent of diabetic patients in our study were Gestational diabetes mellitus (GDM), although 80% or more of glucose intolerance during pregnancy occurs in women with GDM [18]. Diagnosing type 2 diabetes is very difficult during pregnancy because sever forms of GDM have similar clinical characteristics [4].

The most common mode of delivery in our study patients was caesarean section (61.1%), this was in agreement with the results in a study done by Gutierrez et al [19], Mexico 2006 where a cross sectional study on 89 diabetic patients gestational and pre-gestational diabetes (PGDM) was done where cesarean section constitute 58% of cases and mean birth weight was 3.14±0.6 kg.

Cephalo Pelvic Disproportion was the most common indication for Caesarean section in the study due to Macrosomic fetuses and this was in agreement with a study done by Shefal AK, et al [19] at India 2006 where the prevalence of large babies was higher in GDM (27.6%) and PGDM (19.2%) groups in comparison to non diabetic controls (1%).

The perinatal mortality in our study was 6 (11%) and 5 cases of congenital anomalies (9.2%) ,these results were the same as a study done by Sheffield JS, et al [20] ,as he concluded in his study that women with poorly controlled preexisting diabetes in the early weeks of pregnancy are three to four times more likely than nondiabetic women to have a baby with a serious birth defect , such as a heart defect or neural tube defect , a birth defect of the brain or spinal cord .They also at increased risk of miscarriage and stillbirth .

Conclusion

Our research showed that the most common type of diabetes during labour in Erbil Maternity Hospital is Gestational diabetes and Caesarean section is the commonest mode of delivery of the patients. Our study also showed that diabetes is associated with a high incidence of perinatal mortality and major congenital anomalies.

Recommendations

(1)Screening for diabetes for all pregnant ladies in the Antenatal care centers at 24-28 weeks of gestation, for early management of gestational diabetes.

(2)Pre pregnancy strict control of cases with frank diabetes to prevent congenital anomalies and all complications during pregnancy and labour.

(3)Referral of diabetic patient to the Erbil maternity hospital at 38 weeks of gestation for controlled termination of pregnancy (induction of labour or C-Section).

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شەکرە لەکاتی منداڵ بوون : جۆرەکانی, شێوازی لە دایك بوون و باری کۆرپەلە. لە نەخۆشخانەی لە دایـك بوونی فێرکاری هەولێر.

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پوختە

لە لێکۆلینەوەیەکی پێشبینیکراودا, کە لەسەر 54 ئافرەتی دووگیاندا لە نەخۆشخانەی لە دایك بوونی فێرکاری هەولێر, شاری هەولێر هەرێمی کوردستانی عێراق ئە نجامدرا ,ئەو ئافرەتانەی کە لە پێش دووگیانی و لە ماوەی دووگیانیدا شەکرەیان هەبووە, لە رێکەوتی 1ی کانونی دووەمی 2005 تا 1ی ئاداری هەمان ساڵ, بۆ دیاری کردنی جۆرەکانی نەخۆشی شەکرە, شێوازی لە دایك بوون و باری کۆرپەلە. ژمارەی لەدایك بوان لەم ماوەیەدا (2891) بوو وە لەم ماوەیەدا رێژەی شکرە(1.9٪) بوو . تێکڕای تەمەنی ئافرەتەکان 33.65 ± 5,35. تێکڕای کێشی ئافرەتەکان 79,5 ± 13,5. لەمانەش 3,7٪ دووگیانی نۆبەرە بوو, وە 57,41٪ لەجارێك تا چوارجار دووگیان بوونە. لە لێکۆڵینەوەکەی ئێمەدا لە ٪ 63ی ئافرەتەکان شەکرەی دووگیانیان هەبوو, بەڵام ٪ 37 شەکرەیان هەبوو پێش دووگیانی (جۆری یەکەم یان دووەم). هیچ جیاوازیەکی ئاماری گرنگ نەبوە لە نێوان جۆرەکانی شەکرە و تەمەنی دایك وە کێش چەند جارە منداڵ بوە . 61,1٪ی ئافرەتەکان شێوازی منداڵ بوونیان بە نەشتەرگەری کردنەوەی سك بوو (پێش تر بریار لەسەر دراو یان کتوپڕ), بەڵام 29,6٪ی ئافرەتەکان بەشێوازی ئاسایی (لە رێگای زێ) منداڵەکانیان بوو. زیاترین هۆی منداڵ بوون بە نەشتەرگەری کردنەوەی سك دەگەڕێتەوە بۆ نەگونجانی حەوزی ئافرەت لەگەڵ سەری کۆرپەلەکەی. شەش لەم ئافرەتە دووگیانانە منداڵەکانیان مرد (دوو لەمانە 24 کات ژمێر زیاتر تێپەری بوو بەسەر مردنیان, دووانیان لەماوەی 24 کات ژمێر لە مردنیان لە دایك بوون, دووانیشیان پاش ماوەیەکی کەم لەدایك بوونیان مردن). پێنج لە کۆرپەلە لەدایك بووەکان (واتا رێژەی 9,2٪) ناتەواوی زگماکیان هەبوو (چواریان نەخۆشی زگماکی دڵیان هەبوو, وە یەکێکیان ناتەواوی هەبوو لە پێ یەکانی).

مرض السكري اثناء الولادة :انواعه, طريقة الولادة ونتيجة ولادةالجنين فى مستشفى اربيل التعليمي للولادة.

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الخلاصة

لقد أجريت دراسه ميدانيه على 54 أمرأة اثناءالولادة و كن يعانن من داء السكري أثناء الحمل في مستشفى أربيل للولادة – مدينة أربيل – أقليم كوردستان العراق في الفترة من 1/ 1 /2005 و لغاية 3/1 / 2005 وذلك لاظهار نوع السكري أثناء الحمل , طريقة الولادة و مستقبل ولادة الأجنة. مجموع الولادات في هذه الفترة كانت 2891 فاصبح معدل السكري %مساويا 1,9 . متوسط عمر الامهات كان 33.63 ± 5.35 متوسط عمر الام كان 79,50 ± 13,5 .7و3٪ من الامهات كن حملا بكرا و 57,41 ٪ كانو امهات ذوات الولادات المتكررة الكثيرة (اكثرمن 5 ولادات).63 ٪ من الامهات كان السكري من نوع سكري الحمل و37 ٪ كان نوع السكري قبل الحمل (نوع الاول والنوع الثاني) . لم يكن هناك فروق احصائية مهمة بين انواع السكري و عمر الام ووزنها وعدد ولاداتها . 61,1 ٪ من المريضات ولدن ولادة قيصرية (طارىء ومحضر) و29,6 ٪ ولدن ولادة مهبلية منفردة و9,3 ٪ ولدن ولادة مهبلية محضرة .من اهم اسباب الولادة القيصرية هو عدم تناسب حجم الراس للجنين وحوض المرأة .2 من الولادات كانت ميتة داخل الرحم و2 من الولادات كانت ولادة ميتة حديثة و2 من الولادات كانت ميتة في الاسبوع الاول من الولادة .5 من الولادات كانو يعانوا من تشوهاً ولادياً خلقياً (4تشوه القلب وواحد تشوه في الاطراف السفلى).

Received on 28/3/2007 Accepted 23/9/2007

وەرگیراوە لە 2007/3/28 پەسندکراوە لە2007/9/23