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Diabetes effects on mothers and infants parameters

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ABSTRACT

Placenta is a fetal organ that plays a role in food transfer, other functions such as the synthesis of a variety of hormones and growth factors are performed by placenta. In the present study we have studied the effects of diabetes on some parameters of mothers and babies. A total of 40 pregnant women were evaluated in this study, Out of these 40 placentas, 30 were from diabetic pregnant females and 10 from normal pregnant females. Immediately after delivery placenta and fetus weights were recorded. Also maternal and babies blood sugar and mothers age were recorded. All data were compared by Independent t-test, and SPSS (ver. 18) statistical software. The results obtained from this study indicated that the mean blood sugar in the baby groups were significantly different between groups ($p<0.05$), and in babies of diabetics the levels of blood sugar were lower than control babies. Based on the findings of this study and the previous, it is concluded that except babies blood sugar, other parameters were higher in diabetic groups compare to control group.

Key words: Diabetes Mellitus, Blood Sugar, Placenta weight.

INTRODUCTION

Placenta is the most important in intrauterine life of fetus. The Placenta is formed from elements of membrane which surround the developing fetus and the uterine endometrium and provides the means for physiological exchange between the fetal and the maternal circulation and it shows various exchanges in case of diabetic mothers.
Placenta is a fetal organ that plays a role in food transfer, other functions such as the synthesis of a variety of hormones and growth factors are performed by placenta. Mothers Diabetes causes many changes in a variety of hormones, cytokines and maternal metabolites and also same in fetal blood circulation. The diabetes-related changes also affects placenta, as receptors, enzymes and transporters are often existence at two sides of the maternal and fetal placental. Approximately five percent of all pregnancies are complicated by gestational diabetes (DM) mellitus, which increases both maternal and perinatal morbidity (8). In treating women with this condition, many have advocated minimizing fluctuations in blood glucose concentrations to avert maternal hyperglycemia and thus decrease the risk of fetal hyperglycemia and its consequences, fetal hyper-insulinemia and excess fetal growth (6, 10). In the management of gestational diabetes, various methods of glucose monitoring have been proposed, including the measurement of fasting, preprandial, postprandial, and mean 24-hour blood glucose concentrations (6, 7). The results of retrospective study which comparing the outcomes of pregnancy among women with gestational diabetes who were followed with preprandial or postprandial glucose measurements, indicated that the women's glycosylated hemoglobin values were lower and that there was less macrosomia (defined as a birth weight greater than 4000 g) among their infants when treatment was based on the results of postprandial measurements (14).

The presence of maternal DM during pregnancy has important consequences for both mother and child. The development of gestational DM is directly related to increased maternal body mass index [BMI] (9, 22). For example, some studies results indicated that a pre-pregnancy BMI of 30 kg/m^2 or greater was a strong risk factor for the development of gestational DM (22). However some other researchers have defined both maternal obesity and excessive weight gain as major risk factors for pre-eclampsia (1, 20, 21), Caesarian section, preterm delivery, fetal macrosomia and fetal death (3, 23). In a study, tight glucose control was effective at lowering the risk for adverse perinatal events among obese women with gestational DM, but not among those whose BMI were normal (12).

Diabetes mellitus is a common endocrine disorder that can cause significant complications of pregnancy, which including; a) Congenital malformations, b) Premature birth, c) Fetal macrosomia and, d) Intrauterine growth restriction, that were common complications associated with gestational diabetes (15).

The aim of this study is to compare Mothers and infant blood sugar and also infant and placenta weight between diabetic and control patients.

MATERIALS AND METHODS

The study was conducted in two groups. The control group consisted of individuals who were not diabetic and diabetic group. After childbirth in diabetic groups and delivery of the placenta, the weight of fetal placental and infant weight was recorded. Maternal and fetal blood sugar also were examined and recorded.

The results of maternal and fetal blood sugar and placental and fetus weight were analyzed by using Independent t-test of PASW SPSS software (18^{th} version). For comparison between ages of mothers in diabetic and control groups also t-test was used.

RESULTS

The results obtained from this study were presented in table-1. The results of maternal and fetal blood sugar, placental and baby weight and mother age in two groups were given in table-1.

Table1: Maternal and fetal blood sugar, placental and baby weight and mothers age in two groups (Mean ± SE).

	Control group		Diabetic group		Sig.
	Mean±SE	SD	Mean±SE	SD	
Mothers blood sugar	97.30±2.82	8.92	100.86±2.23	12.23	0.402
Fetal blood sugar	68.00±2.00	6.32	62.76±1.24	6.82	0.039
Baby weight	3618.66±79.61	1218.60	3850.00±385.35	436.06	0.374
Placenta weight	585.00±32.53	102.87	620.70±23.31	27.71	0.438
Mothers age	28.40±1.81	5.73	32.13±0.92	5.05	0.058

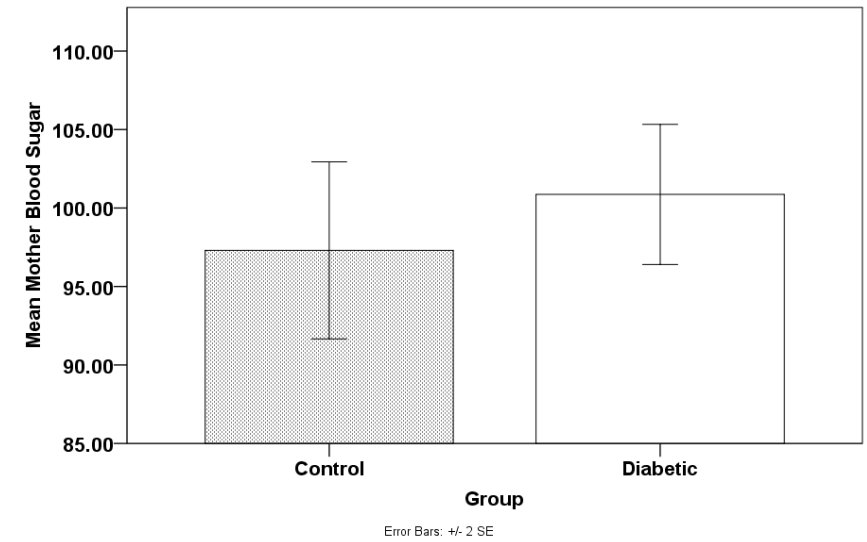

Figure1: Comparison mean mothers blood sugar in control and diabetic groups

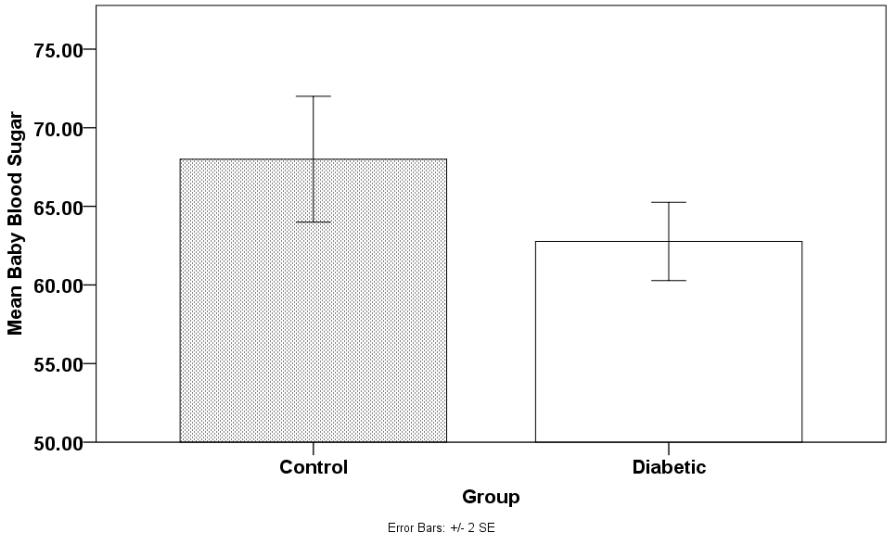

Figure2: Comparison mean baby blood sugar in control and diabetic groups

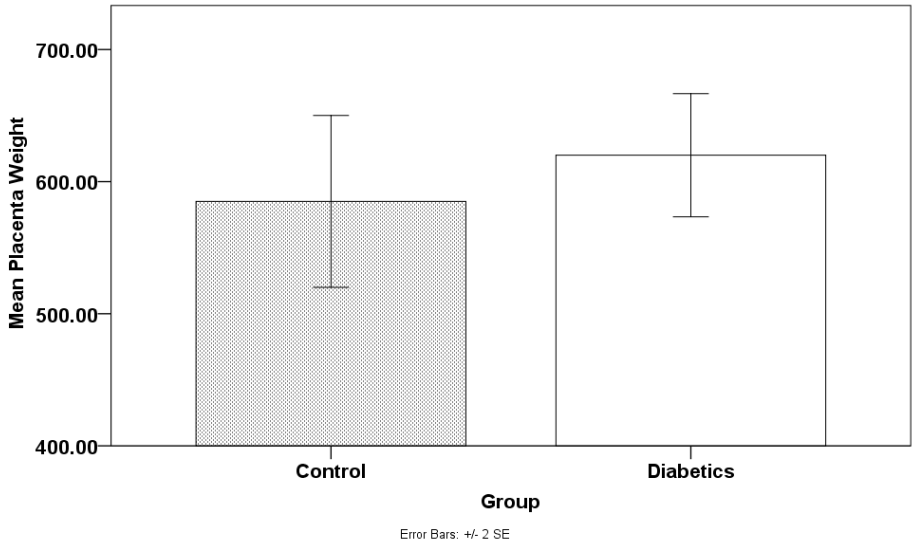

Figure3: Comparison mean placenta weight in control and diabetic groups

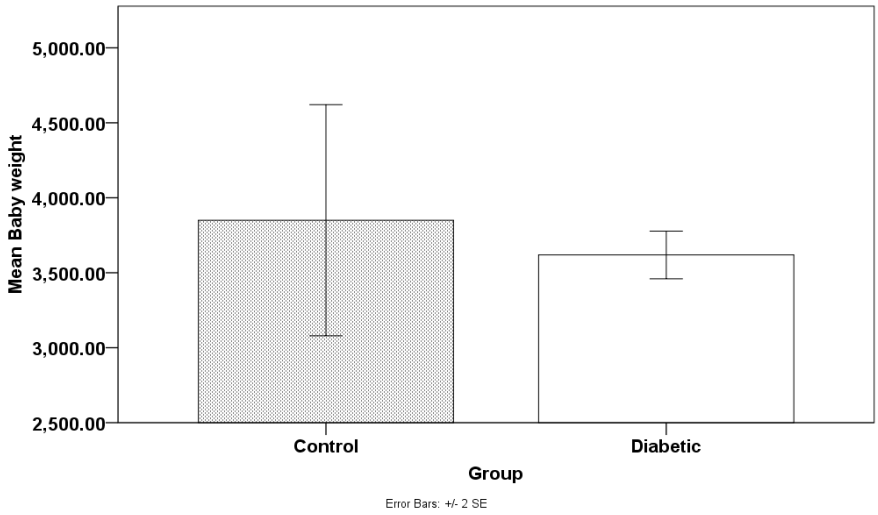

Figure4: Comparison mean baby weight in control and diabetic groups

Our results showed that mother's blood sugar levels in the studied groups were not significantly different ($p>0.05$). But the mother's blood sugar levels in diabetic cases were slightly higher than the control group. The mean blood sugar of babies were significantly different between groups ($p<0.05$), and in babies of diabetics the levels of blood sugar were lower than control babies.

The mean birth weight of babies and placenta weights were higher in diabetics but there were not statistically different between two groups ($p>0.05$). The results showed that the average age of mothers in two groups were not statistically different, although diabetic mothers were older than control group mothers.

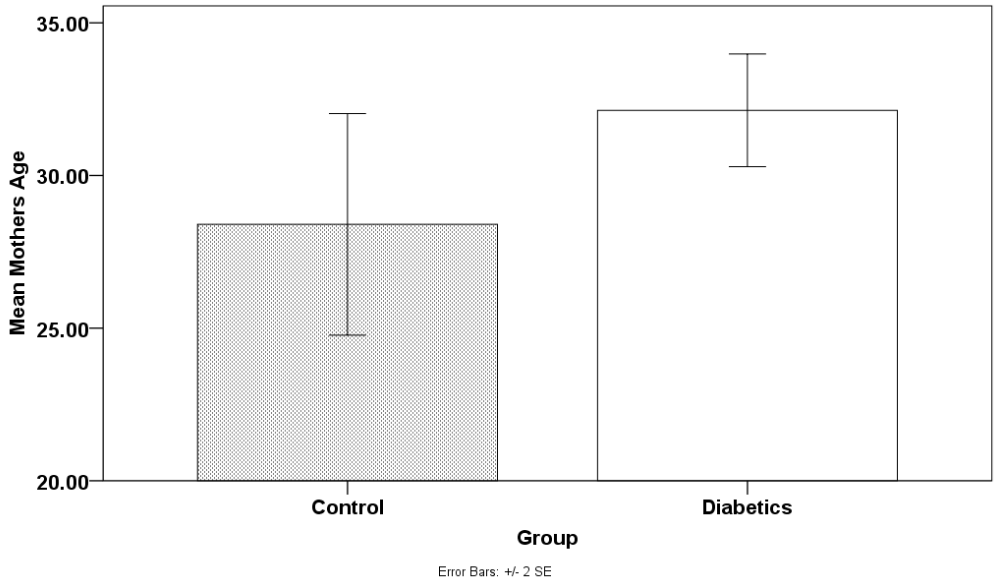

Figure5: Comparison mean mothers age in control and diabetic groups

DISCUSSION

Generally, placenta of diabetic mothers in comparison to non-diabetic mothers undergoes some changes. However, due to various factors which play role in gestational diabetes (type of diabetes, severity of diabetes, treatment method and quality of blood sugar control), exact changes in diabetic women placenta still was not known (4, 5, 11, 19).

Some studies indicated that the control of diabetes in pregnancy periods, prevent microscopic and macroscopic changes in placenta (16, 17).

The results of this study showed that the mean placental weight were not significantly different between the two groups ($p>0.05$). But the mean placenta weight, in diabetic group higher than the control group. Moreover, significant increase in placenta weight and volume in diabetic cases were described (13).

Previously it is reported that the type of diet also partly responsible for the increase in size and weight of the placenta, since there is an inverse relationship exists between protein intake and placental weight (2).

In macroscopic evaluations, only increases in placenta weight of pregnant diabetic women placenta in comparison to non-diabetics were seen, that was in agreement with previous studies (18).

CONCLUSION

The results of present study indicated that the except baby blood sugar, all other parameters were higher in diabetic group but there were not significant differences. However in case of babies blood sugar there was significant difference between groups and it was lower in diabetics infant compare to control group infants.

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