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PROFILE OF COMPLICATIONS IN INFANTS BORN TO DIABETIC MOTHERS

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ABSTRACT

Objective: To determine the frequency of common complications in infants born to diabetic mothers. **Study Design**: Cross sectional study. **Setting & Duration**: Neonatal intensive care unit, National Institute of Child Health (NICH) Karachi from 22th October 2013 to 21st October 2014 **Subjects and Methods:** A total of 100 Type 2 diabetic mothers with age between 28 to 40 years, gestational age of 37- 42 weeks assessed on dating scan presenting with multigravida and mutiparity were enrolled. The outcome was assessed at the time of delivery including cesarean delivery, macrosomia, hypoglycemia, hypocalcemia and hyperbilirubinemia. The data was analyzed and entered into SPSS version 17. P value <0.05 was taken as significant. **Results**: Mean age of the mother was 35.48 ±3.70 years. Mean gestational age of the mother was 39.48 ±1.76 weeks. Mean parity of most of the women was 4.10 ±0.73. Cesarean delivery was observed in 55% women, macrosomia 45%, hypoglycemia 37%, hypocalcemia 20%, and hyperbilirubinemia was observed in 33% patients. **Conclusion**: Diabetes is one of the commonest and important metabolic disorder that affects the health of pregnant women and infants. Infants born to diabetic women are at increased risk compared to those of non-diabetic women.

Key Words: Diabetic Mothers, Cesarean Delivery, Macrosomia, Hypoglycemia

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INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder due to either insulin deficiency (relative or absolute) or due to the peripheral tissue resistance to the action of insulin.[1] It is one of the commonest and important metabolic disorders that affects the health of pregnant women and infants.[2]Diabetes mellitus accompanies 1-2 % of all pregnancies. Despite this low level, it has a high level of prenatal morbidity and mortality.[3] Women are separated into those who are known to have diabetes mellitus before pregnancy or those who developed diabetes during pregnancy as gestational diabetes mellitus.[4] Diabetic mothers have a high incidence of polyhydramnios, preeclampsia, pyelonephritis, preterm labor,chronic hypertension and fetal mortality . Fetal loss during pregnancy is associ-

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ated with poorly controlled maternal diabetes (especially ketoacidosis) and congenital anomalies. Most infants born to diabetic mothers are large for gestational age. If the diabetes is complicated by vascular disease, infants may be growth restricted, especially those born after 37 weeks of gestation. The neonatal mortality rate is >5 times that of infants of nondiabetic mothers with higher mortality rate at all gestational ages and in every birth weight for gestational age category.

The pathogenic sequence constitutes maternal hyperglycemia resulting in fetal hyperglycemia and the fetal pancreatic response .The fetal hyperinsulinernia and hyperglycemia then causes increased hepatic glucose uptake, glycogen synthesis, accelerated lipogenesis, and augmented protein synthesis .

Despite significant improvement in obstetric and pediatric care, the prenatal morbidities and mortalities remain high in such pregnancies.[5]Adverse outcomes are not confined to known diabetics (pre-gestational diabetes) alone, maternal and infant morbidity and mortality is also high among mothers with gestational diabetes mellitus.

Infants born to diabetic women are at increased risk compared to those of non-diabetic women.[5, 6] These babies are macrosomic and have a higher haematocrit.[7]They are more likely to have hyperbilirubinemia, hypocalcemia and hypomagnesemia.[8-10] They have a higher mortality rate.[11]

Although local data on this topic is available and the studies included small sample size of 42 and 40 diabetic mothers respectively.[12, 13] Secondly, pre-conceptional and gestational diabetes mellitus subjects were taken, therefore results cannot be generalized to the target population due to unclearity in the outcomes of the studies. Hence this study is designed with an appropriate sample size and taking pre-conceptional diabetes mellitus subjects only so that the actual magnitude of common complications of infants born to diabetic mothers can be assessed and further precautionary measures could be taken to decrease its related morbidity.

MATERIAL & METHOD

National Institute of Child Health (NICH) is a tertiary care hospital with neonatal intensive care facilities . There is a huge number of neonates ,admitted yearly for various conditions including infant of diabetic mothers.

This cross sectional descriptive study was conducted at National institute of child health from 22-10-2013 to 21-10-2014. A total of 100 Patients of type-2 diabetes mellitus aged between 28-40 years with gestational age from 37-42 weeks assessed on dating scan were enrolled in the study. Women with metabolic syndrome, Cushing syndrome and morbid obesity with BMI >30kg/m^2 were excluded from the study. Sampling technique was non probability consecutive sampling . Sample size (100 patients) was calculated with the help of previous study[13,] with confidence interval 95% and bond on error 7%.

Informed consent was taken as well as institutional ethical review committee approval was taken before starting the study. Brief history regarding the pregnancy and compliance of medication was taken at the time of registration. The outcome was assessed at the time delivery and in the immediate neonatal period including cesarean delivery, macrosomia, hypoglycemia, hypocalcemia and hyperbilirubinemia. The outcome variable and demographic like age, parity, and gestational age was noted in the predesigned proforma. Data feeding and analysis was done on SPSS version 17. Mean ±SD was presented for age and gestational age of the women. Frequency and percentages was computed for parity, cesarean delivery, macrosomia, hypoglycemia, hypocalcemia and hyperbilirubinemia. Stratification was done to evaluate effect modifiers like age, parity, and gestational age, chi square test was applied and significance level was set at 0.05.

RESULTS

Mean age of the mother was 35.48 ±3.70 years. The minimum age of 28 and maximum age of 40 years was observed. (Table 1).

Mean gestational age of the mother was 39.48 ±1.76 weeks. The minimum gestational age of 37 weeks and maximum gestational age of 42 weeks was noted. (Table 1).

Cesarean delivery was observed in 55% women, macrosomia in 45%, hypoglycemia in 37%, hypocalcemia in 20%, hyperbilirubinemia in 33% . (Table-2)

There were 52% women with age ?33 years and 48% women were of age >33 years. (Figure-1).

There were 51% women with gestational age of ?40 weeks and 49% women were of age >40 weeks. (Figure-2).

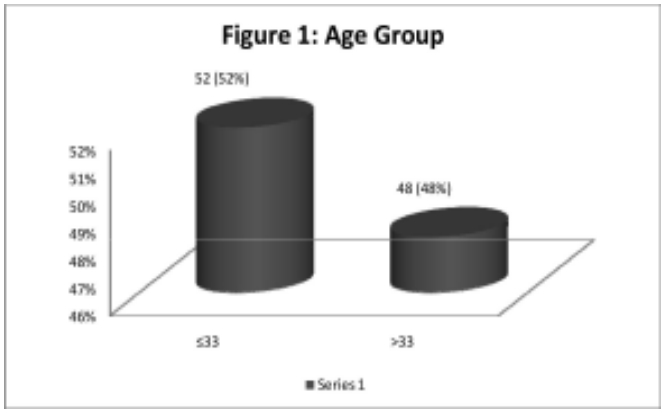
Mean parity of most of the women was 4.10 ±0.73. The minimum parity of 3 and maximum parity of 5

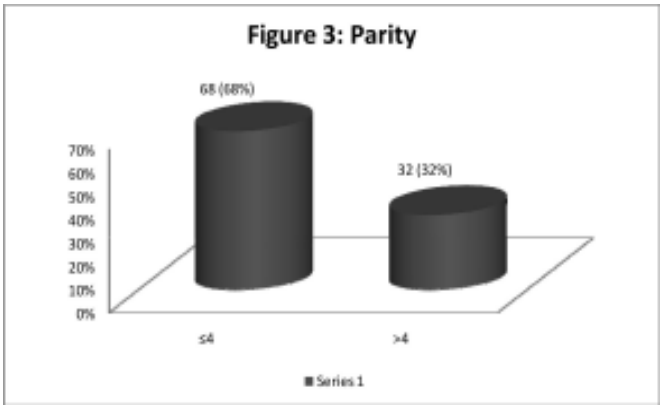
TABLE: 1
AGE AND GESTATIONAL AGE OF THE PATIENTS
n=100

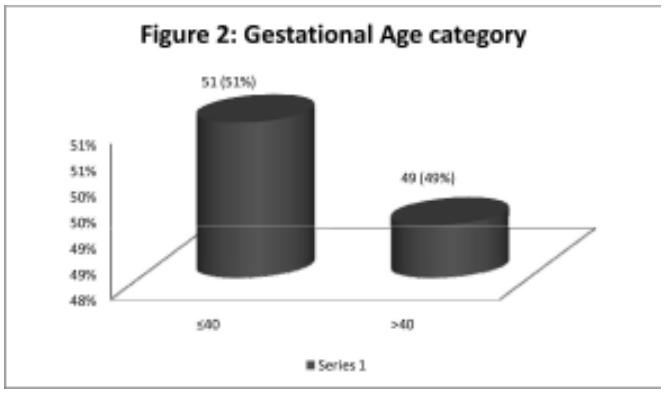
	Mean ±SD	Minimum	Maximum
Age of the patients	35.48 ±3.70	28	40
Gestational age	39.48 ±1.76	37	42

TABLE: 2
AGE OF THE PATIENTS
n=100

Complications	Percentage	Frequency
C-section	55%	55
Macrosomia	45%	45
Hypoglycemia	37%	37
Hyperbilirubinemia	33%	33
hypocalacemia	20%	20







was noted (Figure-3)

There were 68% women with ?4 parity and 32 women with >4 parity.

Stratification was done to see the effect of age, gestational age and parity on the outcome and Chi-square test was applied. Age had an effect on hypocalcemia (p value, 0.025) as the Gestational age had effect on macrosomia, hypoglycemia and hyperbilirubinemia because the p value was less than or equal to 0.05.

DISCUSSION

Diabetes mellitus has long been associated with maternal and perinatal morbidity and mortality. Infant of diabetic mothers have a higher risk for serious complications during pregnancy, delivery and early neonatal life.

Women born in the Asian countries display the highest prevalence of Gestational Diabetes mellitus with upto 17% women likely to develop gestational diabetes in comparison to 4% of European & White

American women.[14, 15]

Infants born to mothers with type-2 diabetes are more commonly obese (macrosomic) . Infant of diabetic mothers from all causes of gestational diabetesare predisposed to late life risk of obesity, diabetes and cardiovascular disease.

Postnatal short term complications in infant of diabetic mothers include hypoglycemia, hypocalcemia, hypomagnesemia, hyperbilirubinemia and polycythemia and these are mainly related with fetal hyperinsulinisim, hypoxia and preterm delivery .[16, 17]

In our study C-section (55%) macrosomia (40%) hypoglycemia (37%) hypocalcaemia (20%) and hyperbilirubinemia (33%) were observed. This is comparable to many local and international studies .[12, 13, 18]

A study from Karachi and Islamabad by Alam M. showed C-section (55%), macrosomia (50%) hypoglycemia (35%), hypocalcemia (15%) and hyperbilirubinmia (30%).[13] This is quite comparable to our present study. Similarly, a study from Peshawar by Hussain M, showed C-section (45%) macrosomia (49%) hypoglycemia (32%).[12]This is also comparable to our present study. A study from India by Wasim R. showed macrosomia (40%), hypoglycemia (36%) hypocalcemia (5%) and hyperbilirubinemia (27%).[18] This international study is also comparable to our present study. The mortality rate in the studies by Hussain M and Alam M was 4.6% and 7.5% respectively.[12, 13] In our study the mortality rate was 6.5% which was quite comparable with the above two studies.

CONCLUSION

This study shows high frequency of complications in infant of diabetic mothers . The most common complication was C section secondary to macrosomia .Others included hypoglycemia, hyperbilirubinemia and hypocalcemia. Therefore, diabetes should be properly controlled during pregnancy to avoid complications in this context.

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* Conceived, designed,editing and final approval, ** Critical revision, drafting and editing
*** Data Collection, statistical analysis
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