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ORIGINAL ARTICLE

Frequency of Neonatal Hypoglycemia Among Women Diagnosed with Maternal Hyperglycemia

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ABSTRACT

Objective: To determine frequency of neonatal hypoglycemia, in maternal hyperglycemia

Subject and Method: This cross-sectional study was conducted at department of Pathology with collaboration of gynae and OBS department of PNS SHIFA Karachi. Study duration was six months from March 2015 to August 2015. All pregnant women who reported at antenatal clinics of PNS SHIFA Hospital and diagnosed as the cases of hyperglycinemia were included in the study**.** Maternal blood glucose testing was done according to WHO guidelines i.e. fasting sample, ingestion of 75 g glucose, 01 h and 02 h sample for plasma glucose estimation. Neonatal blood glucose was checked immediately after birth by glucometer.
All the data was collected via study proforma.

Results: A total of 157 pregnant women were studied their average age was 28.20±4.67 years. Caesarean section was done in 62.4% cases and 58.6% babies were males. Neonatal hypoglycemia was observed among 24.8% of the cases. Neonatal hypoglycemia was statistically significant according to gestational age (p- 0.012), while statistically insignificant according to parity (p-0.184).

Conclusion: As per study conclusion, the neonatal hypoglycemia was observed to be highly prevalent among neonates of diabetic mothers as 24.8%. It was found to be statistically significant according to gestational age.

Keywords: Gestational diabetes mellitus, Neonates, Hypoglycemia

INTRODUCTION

Gestational diabetes mellitus (GDM) is characterized as the intolerance of the glucose of variable severity with beginning or first rise during the pregnancy.[1] Worldwide GDM affects 0.6%-15% of all pregnancies annually whereas, in Pakistan, a prevalence of 8% has been found in Karachi.[2,3] There are however, many gray areas in diagnosis and treatment of hyperglycemia in pregnancy. It has been suggested, however, that current diagnostic criteria for GDM have disadvantage of missing potential adverse pregnancy outcomes as a result of lesser degrees of elevated glucose level that is less severe than that diagnostic of GDM (mentioned above).[4-6] These criteria for GDM diagnosis were recognized above 40 years ago and poorly identify the females during pregnancy who are at high risk for adverse neonatal outcomes.[8] Gestational impaired glucose tolerance (GIGT) is a condition in which two hours post-glucose load level is elevated (7.8-11.1 mmol/L) during an Oral Glucose Tolerance Test (OGTT).[7] But there is no consensus on diagnostic criteria of GIGT. Another category of hyperglycemia called impaired fasting glucose (IFG) has yet not been studied in relation to pregnancy outcomes. Similarly, one-hour post-glucose (1hPG) has not been categorized. On the other hand, a large-scale recent study on maternal hyperglycemia and adverse pregnancy outcome (HAPO) has concluded that strong and continuous associations exists between levels of maternal glucose below those diabetes diagnosis and elevated birth weight and raises in the levels of cord-blood serum C-peptide.[9] Similarly, GIGT has also been shown to be associated with increased rate of cesarean delivery.[10,11] Diabetes of the mothers, which is related to high blood glucose levels (hyperglycemia), is one such compromising climate; overabundance glucose is shunted into the system of fetus which then, at that point should make variations to the adjusted environment.[12] This outcome results in various fetal, neonatal, and post pregnancy consequences for the neonates, which becomes the basis for varied short term and long-term complications in both mother and the baby. However, neonatal hypoglycemia has also been shown to be adverse fetal outcomes as a result of GDM.[9] This study has been conducted to determine frequency of neonatal hypoglycemia, in maternal hyperglycemia even if maternal Oral Glucose Tolerance Test does not correspond to GDM

MATERIALS AND METHODS

This cross-sectional study was conducted at department of pathology with collaboration of gynae and OBS department of PNS SHIFA Karachi. Study duration was six months from March 2015 to August 2015. All pregnant women who reported at antenatal clinics of PNS SHIFA Hospital during 24-32 weeks of pregnancy, undergoing 75gm 2h glucose tolerance test and fulfilling criteria of IFG, IGT OR GIGT were included in the study. All the women having age <18 years, females with pregnancy complicated by other illnesses like hypertension, any autoimmune disease, multiple pregnancy and women who were not agreeing to participate in the study were excluded. Informed consent was taken and purpose of research was explained to them. Blood glucose testing was done according to WHO guidelines i.e. fasting sample, ingestion of 75 g glucose, 01 h and 02 h sample for plasma glucose estimation. Data were noted in proforma of the study. Women were followed till delivery and outcomes mentioned above were noted. Glucose test was done by the researcher herself using glucose oxide method. Categories of women was made on the basis of plasma glucose:

a. Category 1: Fasting Plasma Glucose > 5.3 mmol/L but 01 and 02 h post-load values less than 10.0 and 8.6 mmol/L, respectively (Impaired Fasting Glucose)
b. Category 2: Fasting Plasma Glucose < 5.3 mmol/L 01- hour post load value > 10 mmol/L but 02 h post-load values less than 8.6 mmol/L (Gestational Impaired Glucose Tolerance).
c. Category 3: Fasting Plasma Glucose between 4.5 – 5.3 mmol/L but 01 hr post load value>10 mmol/Land 02 h post-load values less than 8.6 mmol/L.
d. Category 4: Fasting Plasma Glucose < 4.5 mmol/L but 01 and 02 h post-load values less than 10.0 and 8.6 mmol/L, respectively.
e. Category 5: Fasting Plasma Glucose < 5.3 mmol/L but 01 or 02 h post-load values between 9.0 -10 mmol/L and 7.6-8.6 mmol/L respectively.

Confounding variables were removed by strictly following the exclusion criteria. However, patients showing higher results(values diagnostic of GDM) were informed regarding their results due to ethical reasons and excluded from study. Data was stored and analyzed in SPSS-20.

RESULTS

A total of 157 pregnant women were studied their average age was 28.20±4.67 years, similarly average gestational age, fasting blood glucose, OGTT have also been presented in table 1.

Table 1. Descriptive statistics of maternal outcome n=157

Variables		Statistics
Age (Years)		28.20±4.67
Gestational Age (Weeks)		37.85±3.11
Fasting Blood Glucose mmol/L		4.86±0.86
1-h OGTT mmol/L		7.55±1.71
2-h OGTT mmol/L		7.24±1.90
Parity	Primipara	81(51.6%)
	Multipara	59(37.6%)
	Grand multipara	17(1.8%)
Mode of delivery	Normal vaginal delivery	59(37.6%)
	C-section	98(42.4%)
Gender of delivered babies	Male	65(58.6%)
	Female	92(41.4%)

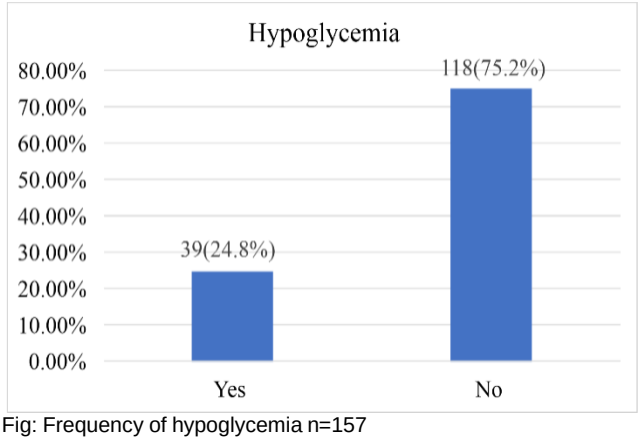

Fig: Frequency of hypoglycemia n=157

Out of all cases, 81(51.6%) were primipara, 59(37.6%) were multipara and 17(1.8%) were grand multipara. Caesarean section was done in 98(62.4%) cases and 59(37.6%) were delivered by normal vaginal delivery. 92(58.6%) babies were male and 65(41.4%) were female.

Frequency of neonatal hypoglycemia was observed among 24.8% of the cases. Fig:1

Neonatal hypoglycemia was statistically significant according to gestational age (p-0.012), while statistically insignificant according to parity (p-0.184) as showed in table.2

Table:2 Neonatal hypoglycemia according to gestational age and parity n=157

Variables		Neonatal Hypoglycemia		p-value
		Yes	No	
Gestationalage	>36 weeks	05	35	0.012
	37-40 weeks	21	66	
	>40 weeks	13	17	
Parity	Primipara	26	59	0.184
	Multipara	10	48	
	Grand multipara	03	11	
	Total	39	118	

DISCUSSION

Diabetes is a typical unexpected problem during pregnancy that leads to critical morbidities of the neonates. Inbabies of diabetic mothers, the hypoglycemia is a typical complication. In this study the frequency of neonatal hypoglycemia was observed among 24.8% of the cases. Similarly, Begum S et al[13] reported that the Hypoglycemia was observed among 38.3% infants of the diabetes mothers. However, Saqib M et al[14] observed lower rate of neonatal hypoglycemia as 14.8% among diabetes mothers. On the other hand, Magadla Y et al[15] reported Hypoglycemia in 39% of infants of diabetes mothers. Our findings are in consistent with those of Lodhi et al[16] who reported hypoglycemia in 29.1% of neonates. Similar results were found in study conducted by the Khan Iet al[17] who reported that 29.3% neonates were found to be hypoglycemic. And hypoglycemia was more common in males (32.7%) as compared to females (21.7 %). Another study conducted by Atrushi AM et al[18] reported that hypoglycemia was found in 17.78% of neonates.

In our study, average age of the women was 28.20±4.67 years. On other hand Magadla Y et al[15] reported that the average maternal age was 33 years, with a range of 18-44 years. In the study of Begum S et al[13] reported that the majority mothers were between 21 and 40 years of age and mostly were multigravida, while in this study primiparous women were found in majority.

In this study, caesarean section was done in 62.4% cases. Study conducted by Begum S et al[13] reported that around 96% of the neonates were delivered via C-sections and the average gestational age was around 36.5 weeks. However, in this study mean gestational age was 37.85±3.11 weeks. On the other hand Imdad S et al[19] reported that majority of infants were delivered through C- section i.e.

58.75%, 25% through SVD and 16.25% were instrumental deliveries.

In this study 92(58.6%) babies were male and 65(41.4%) were females. Similarly, Saqib M et al[14] reported that out of all babies 66.5% were males and 33.5% were females. Pre-gestational and gestational diabetic incidence continues to rise all around the world.[20] Accordingly, it is estimated that morbidities of the neonates neonatal like hypoglycemia, will also rise. The impacts of the prompt breast feeding on the neonatal hypoglycemia and the maternal long-term advantages is strongly linked to earliest start of breast feeding (particularly in diabetic mothers).[20-22] However it is observed that the neonatal hypoglycemia of babies born to diabetic mothers can be corrected by early breast-feeding.[20]

CONCLUSION

As per study conclusion the neonatal hypoglycemia was observed to be highly prevalent among neonates of diabetic mothers as 24.8%. It was found to be statistically significant according to gestational age. Based on strengths and weaknesses of our study we recommend future studies with large sample and multiple settings in order to reach to firm conclusion.

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