



DIABETIC PREGNANCY; PERINATAL COMPLICATIONS

Dr. Afsheen Memon¹, Dr. Aisha Abdullah Sheikh², Dr. Shazia Nawaz³

1. Senior Registrar, Gyn/OBs
Sir Syed College of Medical
Sciences, Karachi.
2. Associate Professor Gyn/Obs,
SSCMS, Karachi
3. Assistant Professor Gyn/Obs
SSCMS, Karachi.

Correspondence Address:

Dr. Afsheen Memon
Senior Registrar, Gyn/Obs
Sir Syed College of Medical Sciences,
Karachi
afsheenmemon354@yahoo.com

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ABSTRACT... Objective: To evaluate perinatal complications in pregnancy complicated with diabetes mellitus. **Patients and Methods:** During this study period all pregnant ladies regardless of age and parity, who were diagnosed as having diabetes whether pregastational or gestational were included in this study. Perinatal outcome was observed in terms of birth weight, macrosomia, preterm baby, stillbirth, intrauterine death, neonatal death, respiratory distress syndrome and congenital anomalies. All informations were recorded on preformed proforma and analysed through SPSS version 11. **Study design:** A descriptive observational study. **Place and duration of study:** This study was conducted in the department of obstetrics and gynaecology unit- I at Liaquat University Hospital Hyderabad, Sindh- Pakistan, from 12th July 2004 to 11th July 2005. **Results:** Among perinatal complications macrosomia was observed in 44% of fetuses, congenital malformations in 5 infants of diabetic mothers. Stillbirth was noted in 5% and neonatal deaths in 10% babies. 55% of neonates suffered from hypoglycemia and 33% had birth asphaxia. **Conclusions:** It was observed in our study that perinatal outcome is highly affected in pregnancy with diabetes. For a successful outcome of pregnancy in such patients a tight glycemc control from conception till delivery, antepartum fetal surveillance and neonatal care by trained paediatrician must be ensured.

Key words: Gestational diabetes(GD), Macrosomia, Asphyxia, Hypoglycemia.

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INTRODUCTION

Diabetes is a universal health problem, that may occur at any age. It becomes a big problem when it occurs during pregnancy as it can badly affect maternal well being and neonatal outcome¹. There are two major forms of maternal diabetes during pregnancy: preexisting or established diabetes and gestational diabetes mellitus (GDM) that develops in course of pregnancy and remits following delivery.

Diabetes occurs in about four per thousand pregnancies in United Kingdom and 2.6 percent of all live births in USA, while a study in Pakistan at Punjab Medical College Faisalabad the incidence came out to be 2% of all pregnant women attending hospital antenatal clinic². The prevalence of (GDM) in some ethnic group ranges from 1 to 14 % depending on different screening

methods, diagnostic criteria and the population screened^{3,4}.

Our local data from Karachi also reported 8% prevalence of GDM⁵. The world health organization that the number of people with diabetes mellitus will increase from 150 million to 333 million by the year 2025. This alarming increase in prevalence of DM will occur mainly in the developing regions of the world and the child bearing age would be most affected⁶. In the developed world the perinatal mortality of infants of diabetic mothers (IDMs) has declined dramatically from 250 per 1000 live births in the 1960s to almost 20 per 1000 live births in the 1980⁵. However in part of world the situation is not encouraging⁶ although many infants of many diabetic mothers have an eventful perinatal course, there is still an increase risk of

spontaneous miscarriages, major congenital malformations, macrosomia, preterm labour,⁵ stillbirth, neonatal deaths, hypoglycemia and intrapartum asphyxia⁷. Evidence suggests that early diagnosis and strict control of blood sugar levels through out the pregnancy can significantly reduce and fetal complications. The aim of this study was to assess the perinatal complications in diabetic mothers at tertiary care unit in our setup so that a better protocol and measures can be developed at gyn/obs level and pediatrics setup to help improving perinatal outcome in diabetic mother.

MATERIAL AND METHODS

This study was conducted at outpatient department (OPD) and labour ward of obstetrics and gynaecology unit- 1 Liaquat University Hospital, Hyderabad, Sindh- Pakistan from 12th July to 2004 to 11th July 2005. Total 100 women between 20-40 years of age having diabetes with singleton pregnancy of >24 weeks of gestation were included in the study by convenient sampling method. Women with pregnancy induced hypertension eclampsia, antepartum haemorrhage and other medical disorder were excluded. During this period all the pregnant ladies regardless age and parity, who were diagnosed as having diabetes whether pregestational or gestational were included in this study. Once the lady was included in the study, her mode of delivery was noted. In addition perinatal outcome was observed in terms of macrosomia, preterm labour, major congenital malformations, stillbirth, neonatal deaths, hypoglycemia. In every case the paediatrician was called at the time of delivery/C-Section. Neonatal blood sugar levels were done with soon after birth. Serum calcium was done at 6 and 24 hours of birth. Patient information was collected on preformed proforma which included maternal age, previous antenatal history, mode and time of delivery and perinatal outcome. All data were analyzed through SPSS version 11.0.

RESULTS

Out of 9200 obstetric patients a total of 100 diabetic pregnant ladies were selected in this

study. Among these 100 patients 70% had gestational diabetes, while 30% had pregestational diabetes (Table I). 36 patients belonged to 20-30 years of age group and 64% to 31-40 years of age group. Majority 55 % of them were unbooked.

Regarding parity 83% patients were multiparous while 17% were primipara. Majority of patient i.e 82% were delivered b/w 37 to 40 weeks, while 18% delivered before 37 weeks. Regarding mode of delivery 65% were delivered by cesarean section, 25% by spontaneous delivery and 10% by instrumental delivery (Table I).

Characteristics	No. of patients	%age
Type of diabetes		
GDM	70	70
Pregestational (Established)	30	30
Age (In years)		
20-30	36	36
31-40	64	64
Parity		
Primi	17	17
Multigravida	83	83
Booking status		
Booked	45	45
Unbooked	55	55
Mode of delivery		
Cesarian Section	65	65
Spontaneous vaginal delivery	25	25
Instrumental delivery	10	10
Table-I. Profile of patients(n=100)		

In our study, 44 % new born were macrosomic. 33% babies delivered with apgar score between 3-6 were labeled as having moderate to severe asphyxia. Among biochemical abnormalities 44 (55%) new borns had hypoglycemia, 12 (15%)

Characteristics	No. of babies	%age	Total
Birth weight			
AGA	56	56	100
LGA	44	44	
Congenital malformations			
No malformations	95	95	100
Anencephaly	2	2	
Duodenal atresia	2	2	
Congenital heart disease	1	1	
Apgar score			
>7	67	67	100
3-6 (moderate to severe asphyxia)	33	33	
Others			
Hypoglycemia	44	55	-
Hypocalcemia	12	15	

Table-II. Perinatal complications

Characteristics	Total	%age
Neonatal death	10	10
Congenital anomalies	4	4
RDS	2	2
Birth asphyxia	4	4
Stillbirth	5	5
Congenital anomalies	2	2
Unexplained	3	3

Table-III. Perinatal mortality

hypocalcemia and 22 (27.5%) had hyperbilirubinemia. Six newborns had congenital malformations, out of these 2% congenital cyanotic heart disease, 1 % microcephaly and 2% had duodenal atresia (Table-II).

In this study 5 new borns were still birth causes were anencephaly in 2 (10%) new borns, while 3 (15%) were unexplained. 10 newborns expired in

early neonatal period, among them 2 (10%) expired due to congenital abnormality, 3 (15%) due to respiratory distress syndrome and 5 (25%) due to birth asphyxia (Table-III).

DISCUSSION

Perinatal mortality (PNM) in Pakistan is amongst the highest in the world and the reflects the poor health of women, poor antenatal care and lack of adequate neonatal services⁷. One of the risk of high PNM in Pakistan is gestational diabetes. Gestational diabetes is defined as any degree of glucose intolerance with on set or first recognition during pregnancy⁸. It is associated with the high risk of type II diabetes mellitus due to insulin resistance and beta cell dysfunctions and is likely to be the result of interactions between genetic, environmental and immunological factors including diet, physical activity and obesity⁹. Woman diagnosed with diabetes prior to pregnancy pre-existing diabetes will experience and increase in insulin demands during pregnancy¹⁰. Diabetes can have significant impact

on maternal, fetal and neonatal outcomes. Studies have shown perinatal mortality rates are two to three times higher amongst babies of diabetic woman as opposed to the general population. Also higher rates of miscarriages, polyhydramnios, macrosomia, preterm labour¹¹, stillbirth, neonatal deaths and congenital malformations¹².

In this study we observed that 75% of our diabetic mothers had gestational diabetes while 25% had pregestational diabetes. Studies from our country have shown the same trend¹³⁻¹⁴. Study from India also shows the same pattern by documenting 86% of GDM and 14% of pregestational DM¹⁵.

Although most of the morbidity and mortality data for the IDM has improved with time but still there are higher rates of congenital anomalies in babies of diabetic women. Congenital malformations observed in our study was 5% and almost same results are seen in the study conducted at Faisalabad hospital². In this regards Aslam et al¹⁶ Haider et al¹⁷ found higher incident 13% and 7.9-25% of congenital malformations respectively in their studies. The pathogenesis of congenital malformations of all types, which have four to ten times higher incidence in pregnant women with diabetes, is very complex and has possibly a multifactorial origin¹⁸⁻¹⁹⁻²⁰.

Macrosomia is a clinical sign of poor diabetic and is associated with wide variety of adverse intrapartum and perinatal outcomes. It leads to increased risk of mechanical obstruction during labour and thus associated with complications like shoulder dystocia²⁵, brachial plexus trauma, facial nerve injury, cephalohematoma and birth asphyxia. The rates of macrosomia are 3.5-4.5 times greater among infants of women with pregestational diabetes than those found in infants born to non diabetic mothers²⁶⁻²⁷. In our study macrosomia was found in 44% neonates. Our results correlate with the study conducted at Isra Hospital Hyderabad¹⁵ In contrast Aslam, et al¹⁷ observed lower incidence (35%) of macrosomia in his study. The higher percentage in our study is probably because majority 55% of our patients

were unbooked. This reflects the poor glycemic control to be directly proportional to the incidence of macrosomia. Macrosomia should be diagnosed antenatally by ultrasound scanning and where disproportion exists, the baby should be delivered by planned cesarean section.

In our study 30% patients had elective cesarean section and 35% underwent emergency cesarean section due to mechanical obstruction. Our results correlates with study conducted by Gul fareen et al¹⁴ but is lower than compared to the observation made in a tertiary hospital of Nigeria²⁸ where elective cesarean sections are reported to be 38.3% and emergency sections are 42.5%.

We observed asphyxia in 33% of cases, however a local study conducted at Shaikh Zayd Hospital Lahore found asphyxia and RDS in 29% of the neonates¹⁶. Another local study conducted at PIMS Hospital Islamabad¹⁷ reported birth asphyxia in 8% of the cases, which is quite low when compared with our study. This could be due to simple fact that every delivery was attended by a trained registrar of pediatrics.

Hypoglycemia is most common neonatal complication that occurs in diabetic pregnancies²⁹. It can be a symptomatic or be accompanied by lethargy, agitation and even convulsions. It must be prevented and recognized early because it can have severe implications for the newborns immediate and future health³⁰⁻³¹. Our study showed hypoglycemia to be 55% (55/100) and hypocalcemia 15% (15-100), which is in contrast to the study conducted by Haider et al¹⁷ in which hypoglycemia was found in only 28%, while hypocalcemia was seen in 25% cases. In this regard our observations were quite similar to the study conducted in shaikh zayed hospital in which hypoglycemia was 45% and hypocalcemia was seen in 7% cases.

The prevalence of diabetes can increase the risk of stillbirth by five times and the risk of neonatal death by three times²¹. Our study showed that sudden unexplained stillbirth occurred in 5% pregnancies (Table III). A study conducted by

Wood SL et al has shown still birth rates in pre diabetic pregnancies as (19.7/1000) and in those occurring after the diagnosis of diabetes (33.7/1000) compared with the non diabetic population(5.5/1000.)²². Other two studies²³⁻²⁴ did not display a significant difference in the risk of stillbirth.

Regarding neonatal death, we observed 10 neonates died because of congenital abnormality, RDS and birth asphyxia. Our findings match with that of Haider G et al, whose study reports 11 neonatal deaths¹⁵(Table-III).

It is now well accepted that if the glucose concentrations during diabetic pregnancy are maintained as near to normal as possible and available techniques for the assessment of fetal growth and wellbeing are used appropriately. The pregnancy outcome is likely to be of a nondiabetic mother³². In this regard measures must be taken seriously and make general population aware of adverse maternal and fetal outcomes in diabetic pregnancy. In addition these measures must also emphasized the importance of antenatal checkups because this is the only way to diagnose the problem early and its treatment can bring about the best results.

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