

# Proper Management of Diabetic Mothers is the Key to Good Fetal Outcome

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## ABSTRACT

The objective of the study was to determine the frequency of fetal anomalies, fetal mortality and morbidity among diabetic mothers. It was a descriptive prescriptive and observational study. The study was conducted at the Department of Obstetrics and Gynaecology, Shalimar Hospital Lahore from 15<sup>th</sup> Jan 2000 to 14<sup>th</sup> Jan 2011. During the study period of one year, fifty patients were studied who were admitted through the antenatal clinic and through emergency. Diabetic mothers of all age groups, booked or un-booked delivered either vaginally or through caesarian section were included in the study. All diabetic mothers with established systematic diabetes mellitus were not included in the study. Patients who were initially admitted to the antenatal ward underwent baseline tests, control of blood sugar and evaluation of fetal well being. In addition to baseline investigations, ophtalmoscopy and renal function tests were also done. Fetal wellbeing as monitored through out the study period. On delivery babies were observed for any complications. The study revealed a perinatal mortality of ten percent had hypoglycemia, forty percent had hyperbilirubinemia and two percent had respiratory distress syndrome. From this study we concluded that good neonatal care and support is important for better outcome of pregnancy in diabetic mothers.

KEY WORDS: Fetal outcome, diabetic mothers, neonatal care.

## INTRODUCTION

The overall incidence of insulin dependent diabetes mellitus complications of pregnancy is approximately 0.1 to 0.5%. The incidence of gestational diabetes is reported as 2-3% in western countries, is comparable to the incidence in Pakistan. There is a well established relationship between maternal diabetes and neonatal idiopathic respiratory distress syndrome.<sup>2</sup> Perinatal mortality significantly increases in gestational diabetic pregnancies if the metabolic abnormality is not recognized or treated properly. Increasing maternal HBAI prior to delivery has been associated with increased relative risk of incidence of neonatal morbidity.<sup>3</sup> In addition to an increased risk of intrauterine fetal death, commonly reported perinatal morbidity, associated with gestational diabetes mellitus includes an increased incidence of Macrosomia, birth trauma, neonatal hypoglycemia, hypobilirubinemia, hypocalcaemia and polycythemia.<sup>4</sup>

Regarding Macrosomia, serial sonography has showed that diabetic mother's fetuses present with much more adipose tissue particularly of arm and high of at 28 to 32 weeks, of shoulder at 34 to 38

weeks and in all the muscles at term pregnancy as compared to fetuses of non-diabetic mothers.<sup>5</sup>

## PATIENTS AND METHODS

The study was carried out in the department of Obstetrics and Gynaecology of Shalimar hospital Lahore from 15<sup>th</sup> Jan 2000 to 14<sup>th</sup> Jan 2001. It was a prospective observational study. Fifty diabetic mothers of all age groups, booked or un-booked delivering vaginally or through caesarian section at Shalimar Hospital were included in the study. All diabetic mothers with any established systemic disease related to diabetes mellitus were not included in the study.

The patients were initially admitted to the antenatal ward (88%) for baseline tests, control of blood sugar and evaluation of fatal well being. Majority of these patients were gestational diabetics picked up usually as potential diabetics while some were pre gestational diabetics. All these investigations were not possible in patients (12%) who were admitted at the time of labour in emergency.

For patients with poor control, previous perinatal losses or associated medical or obstetric complications, abdominal delivery was preferred.

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However, if pregnancy was apparently normal it was allowed to continue up to 40 weeks. If some complication presented than delivery was planned at 38 weeks and the route of delivery was vaginal. Babies hypoglycemia, hypocalcaemia, hypobilirubinemia, congenital anomalies, respiratory distress syndrome and tachyphonea. All aspects of study were carefully recorded.

### RESULTS

Majority eighty eight percent (88%) of the patients included in this study were booked and had proper antenatal care, complete investigations and assessment prior to term. Only twelve percent (12%) has no antenatal care and were admitted directly into the labor room for the first time during their pregnancy.

Total number of patients included in the study where 50. After selecting the patients they were grouped under the following categories.

**Table 1:** Type of Diabetes

Type of Diabetes	Number of Patients	Percentage
Gestational diabetes	35	70
Pre-gestational diabetes	15	30
Total	50	100

**Table 4:** Fetal Outcome

Fetal Outcome	Elective Caesarian Section	Emergency Caesarian Section	Spontaneous Vaginal Delivery	Assisted Vaginal Delivery %age
Normal Live birth	25 (50%)	3 (6%)	13 (30%)	2 (4%) 90%
Apgar score				
a. 1 minute				
Upto 5 From 6-7		1	2	1
From 8-10	2	2	4	1
b. 5 minutes	9	14		9
Upto 5				
From 6-7				
From 8-10				
Perinatal mortality	25	3	15	2
a. Fresh still birth				10%
b. Macerated birth	1		1	
c. Neonatal death		1	1	
		1		

**Table 2:** Age of Mother

Age group	Number of Patients	Percentage
20-30 years	22	44
30-40 years	26	52
40 and above	02	04
Total	50	100

Almost half the patients (52%) were between 30 to 40 years old: whereas 44% were between 20-30 years of age and only 4% were of 40 years or above as shown in table 2.

Out of the total 50 patients 43 (86%) were delivered at term whereas 7 (14%) patients were delivered at 37 weeks of gestation. This include both iatrogenic pre-term delivery due to maternal complications and spontaneous deliveries as shown in table 3.

**Table 3:** Duration of pregnancy

Duration of pregnancy	Number of Patients	Percentage
Pre term	07	14
Term	43	86
Total	50	100

In this study the number of babies delivered alive were 43 (86%) as shown in table 4. Caesarian section was performed in 28 cases out of which 25 were elective due to different indications and only 3 were emergency caesarian section which were performed on patients directly admitted in labor room. Fifteen patients (93%) were delivered by vaginal route out of which 14 (28%) were spontaneous and 1 (2%) were assisted vaginal deliveries.

Table 4 also shows the immediate delivery outcome in apgar score and perinatal mortality in diabetes. No significant difference in apgar score could be found between the vaginal delivery and caesarean section. A trend of higher 5 minutes apgar score was positively seen in 100% of the newborns.

Incidence of Macrosomia was 35% in the present study. Potentially associated morbidities included birth trauma, neonatal hypoglycemia and childhood and adolescent obesity. Birth weight can be seen in table 5.

**Table 5:** Birth Weight

Birth Weight (KG)	Number of Patients	Percentage
2 to 2.5	02	04
2.6 to 3	11	22
3.1 to 3.9	20	40
4 and above	17	34
Total	50	100

**Table 6:** Postnatal Complications

Postnatal complications	Number of Patients	Percentage
Macrosomia	17	34
Hypoglycemia	09	18
Hypobilirubinemia	20	40
Congenital malformations	03	06
Respiratory distress syndrome	01	02
Total	50	100

The major potential complications of babies born to diabetic mothers included large size of gestational age 34%, hypoglycemia 18%, hyperbilirubin 40%, congenital malformation 6% and respiratory distress syndrome 2%. All these

figures are comparable with other studies carried out to find out the incidence of postnatal complications.

## DISCUSSION

It is evident that the statistical data of our study is in general agreement with those reported from other recent large studies. Although absolute comparisons are difficult as the number of patients, pre-delivery variables, methods of study and projection of problems differ in different studies or countries.

A review of the study of fetal outcome in diabetic pregnancy of fifty cases showed a perinatal mortality of 10% which is comparable with our national figures of 9.5%.<sup>6</sup> Comparing the perinatal mortality of our study with those of our similar studies shows the perinatal mortality of about 8.2% and 81%<sup>7,8</sup>. Our high perinatal mortality is due to a number of factors. Some of our patients were young and uneducated and percent (12%) patients with pregestational diabetes having received no organogenesis with poor control thereby increasing the incidence of perinatal morbidity and mortality.

The incidence of congenital abnormalities in pregnancy with diabetes as shown by a study conducted by Aucott et al is 7.7%<sup>9</sup>. A similar study conducted by Verma et al (1991) shows the incidence to be 3.6%. In the present study the incidence is 6%.

Over the last 10-15 years after considerable reduction of respiratory distress syndrome, congenital malformations have emerged as the leading cause and 50% of perinatal mortality in our study was contributed by congenital malformations.

In the present study the incidence of Macrosomia was 34% compared to another study with higher incidence of 41%<sup>10</sup>.

Fetal outcome is influenced by several factors, including chronic hypoxia, polycythemia, increased platelet aggregations, lactic acidemia and hypertrophic cardiomyopathy. To reduce unexplained fetal death, again good control of diabetes and institution of antepartum test for fetal well-being are required. In our study we relied on simple tests of fetal kick count, serial measurement of symphysis fundal height, ultrasonography and cardiotocography. Biophysical profile has been used only where other tests indicated fetal compromise due to lack of resources.

It is recommended that biophysical profile be done twice weekly after 28 weeks in insulin dependent diabetes mellitus. Most other researchers have recommended weekly or twice weekly biophysical profiles from 36 weeks until delivery. <sup>11</sup>

Gestational diabetes does recur in about 60% of subsequent pregnancies and 40% of gestational diabetics will develop non insulin dependent type within 15 years after delivery. <sup>12</sup>

Our goal was to achieve vaginal deliveries whenever possible but 56% of our patients were still delivered by caesarean section which is comparable with incidence of caesarean section shown in study conducted by Aucott et al in 1994 which is 55%. Such a high incidence was to a major extent due to a large number of women having had multiple previous pregnancy losses (30 patients) followed by a high incidence of Macrosomia 34%. The first group was unavoidable but macrosomia can be reduced by good control.

Management of diabetic pregnancy is not to be feared, as a key to good outcome are simply preconception counseling, universal screening for diabetes, good control right from conception to delivery, good antepartum fetal monitoring and neonatal support.

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