Morbidities and Mortalities Among Infant of Diabetic Mother in a Newly Established SCANU of a Tertiary Care Hospital, Bangladesh

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Abstract

Introduction: Diabetes mellitus has long been associated with perinatal morbidity and mortality. It complicates 2% to 3% of all pregnancies; 90% of these cases present with gestational diabetes mellitus. In our population Gestational diabetes mellitus develops among 6.7% of all pregnancies. Macrosomia (28%), hypocalcaemia (22%), hyperbillirubinaemia (19%), polycythemia (34%), perinatal asphyxia, birth injury and congenital anomaly (6-9%) are the complications of infant of diabetic mother (IDM). **Materials and Methods:** This prospective observational study was done in the newly established Special Care Neonatal Unit (SCANU) to determine the morbidities and mortalities among IDM babies admitted in to Mymensingh Medical College Hospital (MMCH), Bangladesh from January to March 2015. A total 50 IDM patients who admitted during this period were recruited in the study irrespective of their gestational age, birth weight, pattern and duration of maternal diabetes. **Results:** Male and female patients were 29 (58%) and 21 (42%). Caesarian and vaginal delivery were 43 and seven cases. Gestational and pre-gestational diabetes mothers were 35 (70%) and 15 (30%) respectively. The important morbidities in order of frequency were found perinatal asphyxia (50%), macrosomia (48%), neonatal jaundice (44%), hypoglycaemia (40%), hypocalcaemia (36%), polycythemia (28%), CHD (20%), neonatal sepsis (20%), birth trauma (12%), TTN (6%), RDS (6%), GIT problem (2%) respectively. Mortality was recorded in three patients. **Conclusion:** Our observations show the high prevalence of IDM (24/1000 live birth) and their various complications. Mortality and morbidity is a bit higher in IDM. Our health policy maker should give adequate emphasis on management of IDM babies.

Key words: Infant, diabetic, morbidities, mortalities.

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Introduction

Diabetes mellitus is characterized by hyperglycaemia, disturbance of carbohydrate, fat, and protein metabolism that are associated with absolute and relative deficiencies in insulin action and/or insulin secretion[1]. An infant of a diabetic mother (IDM) is a baby who is born to a mother with diabetes.

In pregnancy, there is an inevitable sharing of maternal nutrients through transport via placenta to the fetus, thus any changes in the maternal systems affect the fetal plasma composition and organogenesis. Maternal diabetes is one of the compromising environment for the fetus which complicates 2% to 3% of all pregnancies; 90% of these cases present with gestational diabetes mellitus[2]. In our population Gestational diabetes mellitus develops among 6.7% of all pregnancies[3].

Diabetes mellitus has long been associated with perinatal morbidity and mortality. Among all complications hypoglycaemia is the most commonest and most dangerous problem[4]. IDM has 47% risk of having significant hypoglycaemia[5]. Lethergy, apathy, limpness, apnoea, tremors, jitteriness, irritability are the symptoms of hypoglycaemia. Macrosomia (28%), hypocalcaemia (22%), hyperbillirubinaemia (19%), polycythemia (34%), perinatal asphyxia, birth injury and congenital anomaly (6-9%) are the other complications of IDM[5].

This newly established Special Care Neonatal Unit (SCANU) at our hospital is serving about 30 million population of greater Mymensingh. It caters for sick inborn neonate as well as serves as a referral centre for sick newborn from the six districts under greater Mymensingh. Daily about 30 patients were admitted in our neonatal ward; among them 2.4% patients were infant of diabetic mother. So, IDM is not so uncommon in our unit who need prompt and proper management.

In view of the high morbidity and mortality associated with infant of diabetic mother, our study was aimed at to determine the prevalence of the common morbidities and to find out the causes of mortality among IDM and thus improving our services and facilities to save the tiny life as well as to serve a healthy newborn for future.

Material and Methods

This prospective observational study was done in the SCANU of Mymensingh Medical College Hospital (MMCH) from January 2015 to March 2015. A total 50 IDM patients who admitted during this period were recruited in the study irrespective of their gestational age, birth weight, pattern and duration of maternal diabetes.

The study protocol was approved by ethical review committee of MMCH. After taking informed written consent from the mother or caregiver details history regarding mother and the infant were taken. Maternal history was taken about parity, type and duration of diabetes, treatment received for diabetes, mode of delivery and maternal outcome. Regarding infant's history time and place of delivery, history of convulsion, respiratory distress, cyanosis etc were taken.

After resuscitation (if needed) thorough physical examination was done with special attention to asses gestational age, birth weight, signs of hypoglycaemia and hypocalcaemia and also to seek any congenital anomaly. Infants having birth weight equal or more than 4000gm referred as macrosomic and less than 2500gm referred as low birth weight baby.

Some relevant investigations were done where applicable like complete blood count, septic screening, serum electrolytes, serum bilirubin, chest radiographs. But in all cases blood glucose level was measured. Hypoglycaemia was defined as blood glucose concentration <2.6mmol/l, hypocalcaemia was defined as total serum calcium <7mg/dl, when peripheral venous haematocrit level was greater than 0.65 then it was defined as polycythemia. Routine echocardiogram could not be done due to cost but it was done in suspected infants of cardiac symptoms who had symptoms like cardiac murmur, persistent cyanosis, signs of heart failure etc. All the infants were treated accordingly in line with the hospital management protocol. Babies were discharged when presenting complaints were improved, feeding was well established, bowel and bladder were moved normally and investigation reports became normal.

Results

Among all 50 patients, twenty nine (58%) were male and twenty one (42%) were female. Forty three patients were delivered by caesarian section and seven patients were delivered by vaginal delivery. Gestational age ranged from 35weeks to 41weeks, among them >37weeks were 47 patients (94%) and <37weeks were three patients (6%). 35 infants had mother who had gestational diabetes (70%) and15 patients had mother who had pregestational diabetes (30%). Maximum patients were admitted before the age of 24 hours and residence of maximum parents were in urban area.

Most of the patients presented with the complaints of apparently large baby, respiratory distress, delayed cry after birth, convulsion, cyanosis, reluctant to feed and yellow coloration of body.

The commonest morbidities were perinatal asphyxia, macrosomia, neonatal jaundice, hypoglycaemia, neonatal sepsis, polycythemia and congenital heart disease. Among all IDM congenital heart disease was present in 10 patients (20%), RDS was present in three patients (6%) and TTN was present in three patients (6%). Mortality was recorded in 3 patients. Among them one was severely asphyxiated and two had complex congenital heart disease with heart failure. All of them died within 48hours of life.

Table 1: Demographic characteristics at the time of admission, (n=50).

Characteristics		Frequency (%)
Gestational age	> 37weeks	47 (94)
	< 37weeks	3 (6)
Postnatal age at the time of admission	<24hours	42 (84)
	>24hours	8 (16)
Gender	Male	29 (58)
	Female	21 (42)
Place of delivery	Inborn	30 (60)
	Out born: clinic, hospital	14 (28)
	Home delivery	6 (12)
Mode of delivery	Vaginal route	7 (14)
	Caesarian section	43 (86)
Residence	Urban area	37 (74)
	Rural area	13 (26)
Types of maternal diabetes	Gestational diabetes	35 (70)
	Pre-gestational diabetes	15 (30)

Table 2: Presenting complaints during admission.

Complaints	Frequency (%)
Large baby	38 (76)
Respiratory distress	31 (62)
Delayed cry	25 (50)
Convulsion	15 (30)
Cyanosis	13 (26)
Jaundice	6 (12)
Reluctant to feed	4 (8)
Abdominal distension	1 (2)

Table 3: Morbidities and mortalities associated with IDM.

Cases	Frequency (%)
Perinatal asphyxia	25 (50)
Macrosomia	24 (48)
Neonatal jaundice	22 (44)
Hypoglycaemia	20 (40)
Hypocalcaemia	18 (36)
Polycythemia	14 (28)
Congenital heart disease	10 (20)
Neonatal sepsis	10 (20)
Birth trauma	6 (12)
TTN	3 (6)
RDS	3 (6)
GIT problem	1 (2)
Death	3 (6)

Discussion

IDM has already been recognized as one of the important causes of neonatal morbidity and mortality. In our study prevalence of IDM is 24/1000 live birth which is a bit higher than any other study. The facilities and manpower available at our hospital are broadly not equivalent to those envisaged in a referral neonatal unit of Bangladesh. The paper therefore provides a case study of neonatal outcomes of infant of diabetic mother at a well functioning neonatal unit in a tertiary level hospital.

In this study, it has been identified that the maximum IDM had gestational diabetic mother (70%) and remaining had pregestational diabetic mother (30%). This findings is almost similar to the findings of another study[6,7,8]. But our study differs from Begum A et.al[9].

Out of 50 infants most of the infants about 94% were term baby and most of them were delivered by caesarian section (86%). This correlates with the findings of other studies[8,9,10,11]. Reports of Ranade et.al showed a bit lower prevalence of term IDM which was dissimilar with our study[12]. This difference in observation might be due to that in his study the IDM were delivered by elective caesarian section to prevent the complication of large baby but as a country of dense population our pregnant women were deprived of proper antenatal check up and thereby most of them were not aware about their glycaemic condition and there was no proper planning for the delivery of the baby.

Clinically apparently large baby (76%) was the commonest presenting symptoms followed by respiratory distress (62%), delayed cry (50%), convulsion (30%), cyanosis (26%), jaundice (12%),

reluctant to feed (8%) and abdominal distension (2%). This findings were almost similar with other study[7].

In this study the important morbidities in order of frequency were found perinatal asphyxia (50%), macrosomia (48%), neonatal jaundice (44%), hypoglycaemia (40%), hypocalcaemia (36%), polycythemia (28%) congenital heart disease (20%), neonatal sepsis (20%), birth trauma (12%), TTN (6%), RDS (6%), GIT problem (2%) respectively. Other study also found similar results[8,12,13,14]. But our findings were dissimilar with the results of some study[8]. Perinatal asphyxia was the top most problem in this study as because most of the pregnant mother at first tried at home for delivery and they came to hospital only when any complications like prolonged labour, obstructed labour were developed.

Out of 50 patients three were died (6%). One of them were severely asphyxiated and remaining two had complex congenital heart disease with heart failure. This findings correlates with other study[8,9].

Conclusion

Our observations show the high prevalence of IDM (24/1000 live birth) and their various complications. The mortality and morbidity is a bit higher in IDM. So, life style modification, proper planning for pregnancy, regular antenatal check up and to conduct delivery at a hospital where the facilities for neonatal care is available are mandatory. Our health policy makers should give adequate emphasis on above measures.

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