

Metabolic Complication in Infant of Diabetic Mothers.

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Abstract:

Objective: To determine the frequency of metabolic complications in infants of diabetic mothers.

Methods: This study was conducted in NICU, RIMS RANCHI over a period of one year. Infants born to diabetic mothers (n = 80) were enrolled in this study and kept in NICU for first 24 hours of life. Serial blood glucose monitoring was done using glucose strips. Serum calcium and serum magnesium level were done at 6hrs. and 24 hrs. of life.

Results: Out of 80, infant of diabetic mothers, 42 (52.5%) were males and 38 (47.5%) were females. Birth weight was between 2.5 kg to 3.99 kg in majority of infants (73.8%). The most frequent metabolic complication was hypoglycaemia that occurred in 32 (40%) neonates, hypocalcaemia was seen in 10 (12.5%) neonates and hypomagnesaemia in 4 (5%) neonates.

Conclusion: Metabolic complications are commonly occurring complications in infants of diabetic mothers (IDM). Their monitoring and early treatment is very important so that overall outcome is improved and any future complication could be avoided.

Keywords: IDM, hypoglycaemia, hypocalcaemia, hypomagnesaemia.

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I. Introduction

Diabetes during pregnancy has been associated with fetal and maternal morbidity and mortality. Perinatal mortality was as high as 60 – 65% before the development of maternal, fetal and neonatal care units and since then there has been considerable decrease in morbidity and mortality.

Infants born to diabetic mother are at increased risk of complications as compared to non-diabetic mothers. Currently 0.2 – 0.5% of all pregnancy are affected with diabetes and almost 80% constitute gestational diabetes. Poor metabolic control in mother and exposure of the fetus to maternal hyperglycaemia and is responsible for perinatal, natal and postnatal complications.

Metabolic complications are the most common and important group of complications and includes hypoglycaemia, hypocalcemia, hypomagnesemia, hyperbilirubinemia. Incidence of complications are hypoglycaemia (35.5%), hypocalcemia (15%), hyperbilirubinemia (30%) and hypomagnesemia 9 4.5%). Hypoglycaemia has highest incidence, hypocalcemia occurs in neonates with history of birth asphyxia and hypomagnesemia occurs secondary to hypocalcemia. There is increased risk of hyperbilirubinemia because of polycythemia and immature hepatic bilirubin metabolism. With this background, we conducted this study to identify the frequency of metabolic complications in infants of diabetic mother which when diagnosed and treated early helps in reducing morbidity and mortality of infants of diabetic mother.

METHODS:

This study was conducted in NICU, RIMS RANCHI over a period of one year. A total of 80 infants born to diabetic mother were included in this study.

EXCLUSION CRITERIA:

1. Congenital malformation.
2. Chromosomal abnormalities.
3. Death before confirmation of complications.
4. Gestational age less than 30 weeks.

All births whether vaginal delivery or c- section were attended by paediatrician and neonates were kept in NICU for 24 hours and laboratory investigations were done.

Blood sugar level were done under aseptic condition, blood samples were collected from heel by heel prick method and checked by glucometer at 1, 2, 4, 8, 12, 24 hours of age.

For determining Calcium and magnesium level about 2 – 3 ml blood was drawn at 6 and 24 hours of age. Non oxalated samples were sent and serum calcium estimation was carried out on chemistry analyser.

II. Results:

Out of 80 infants of diabetic mother (IDM), 42 (52.5%) were males and 38 (47.5%) were females. Majority 65 (81.25%) were born between 37 – 39 weeks, 9 neonates (11.25%) were born after 39 weeks and 6 (7.5%) neonates were born before 37 weeks. The mean gestational age was 37.58 ± 1.35 SD. The mean birth weight was 3.34 ± 0.714 kg SD.

When assessed on centile charts for birth weight for gestational age 42 (52.5%) were appropriate for age (AGA), 7 (8.75%) were small for gestational age (SGA) and 31 (38.75%) were large for is gestational age (LGA). All the neonates were monitored for metabolic complications. Hypoglycaemia was the most frequently occurring complication found in 32 (40%) neonates, hypocalcemia in 10 (12.5 %) neonates and hypomagnesaemia in 4 (5%) neonates.

Table 1- Distribution of Neonates According to Gestational Age

Gestational Age	No. of patient's	%
<37 weeks	6	7.5%
37 – 39 weeks	65	81.25%
>39 weeks	9	11.25%

Table 2 - Frequency of complication in infants born to diabetic mother

Complication	No. of patient's	%
Hypoglycaemia	32	40%
Hypocalcemia	10	12.5%
Hypomagnesaemia	4	5%

III. Discussion

In this study infants born to diabetic mother were admitted and were studied for frequency of metabolic complications in first 24 hours of age. In this study there was male predominance (52.5%) and mean gestational age was 37.58 ± 1.35 SD weeks.

Pregnancy is a diabetogenic state where insulin sensitivity decreases with increasing gestational age thus increasing the risk of developing diabetes during pregnancy in previously non diabetic women.

The most common metabolic complication in infants of diabetic mothers (IDM) is hypoglycaemia (40%). There is rapid decline in glucose concentration. Maternal hyperglycaemia leads to fetal hyperglycaemia stimulating fetal pancreas to synthesize excessive insulin, after separation of placenta there is sudden interruption of glucose infusion but hyperinsulinemia persists. Hypoglycaemia reflects poor maternal glycaemic control.

Hypocalcemia was other common metabolic complication. It may be due to hyperparathyroidism of diabetic mothers which may suppress fetal parathyroid function and lead to hypocalcemia. In this study hypocalcemia was found in 12.5% cases.

The other complication which occurred was hypomagnesaemia in 4% cases.

Morbidity and mortality is high in our country due to poor antenatal check up, poor compliance to therapy, decreased knowledge of the disease, non-booked deliveries and lack of neonatal services.

Early recognition and treatment of complications reduces the long term morbidity and mortality.

IV. Conclusion:

Infants of diabetic mothers are at risk of developing fetal, perinatal, natal and postnatal complications. Diabetic pregnancy needs control of maternal diabetes, fetal monitoring, good perinatal and neonatal monitoring so that short and long term outcome are improved and future complications could be avoided due to metabolic complications.

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