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Case Report

Congenital Diaphragmatic Hernia in a Neonate of Diabetic Mother with an Episode of Diabetic Ketoacidosis

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ABSTRACT

We are reporting a case of 35 years $G_5P_{4+0}L_4$ admitted to obstetric emergency at 34 weeks gestation with decreased fetal movement. She was a known case of type II diabetes mellitus and was taking oral hypoglycaemics for last 3 years, who had an episode of diabetic ketoacidosis in the third trimester of pregnancy after she was given inj. Dexamethasone for fetal lung maturity. Diabetic ketoacidosis is a serious metabolic complication of diabetes with high mortality if undetected. The patient was shifted to ICU. Since her condition was deteriorating; labour was induced with inj. Syntocinon. She delivered a neonate with Congenital Diaphragmatic Hernia which is a rare entity and its association with pre-gestational diabetes is rarely seen. This case therefore considers two rare manifestations occurring in a patient with pre gestational diabetes.

Keywords: Congenital Diaphragmatic Hernia, Pre - gestational Diabetes, Diabetic Ketoacidosis

INTRODUCTION

Gestational diabetes and pre gestational diabetes increase the incidence of congenital malformations in fetus of pregnant female. Exposure of the embryo to maternal hyperglycemia during the stage of organogenesis is postulated to lead to the development of congenital malformations. Its incidence is 10%.[1] Risk of malformations is similar to that in women with pre- existing diabetes /Gestational diabetes mellitus diagnosed in first trimester. The incidence of DKA in pregnancy is 1 – 3 % [2] with fetal loss rate of 9 %. We are reporting a case of diaphragmatic hernia in a neonate of diabetic mother who also had an episode of diabetic ketoacidosis at 34 weeks of gestation. Coexistence of these two conditions is rare. Only few literatures are available.

CASE REPORT

35 years $G_5P_{4+0}L_4$ admitted to obstetric emergency at 34 weeks gestation with decreased fetal movement. She was a known case of type II diabetes mellitus and was taking oral hypoglycaemics for last 3 years. During her entire antenatal period, she

did not have an obstetric check up and no investigations were done. She consulted a general practitioner for treatment of diabetes who advised her to continue oral hypoglycaemics. Her mother was a known case of diabetes for the last 15 years .There is no history of hypothyroidism, exposure to any occupational or environmental chemicals, nitrofen or anticonvulsants intake. Her last menstrual period was not known but by first scan (24 weeks) she was 34 weeks. Her past obstetric history was uneventful; all her issues were alive and healthy. At the time of admission her abdomen was over distended (cause polyhydromnios), uterus was 34-36 weeks size, cephalic presentation with free floating head.fetal heart rate was 160bpm, regular. Patient was breathless but bilateral lung fields were clear, she also had pedal edema. All her routine investigations except sugar levels were within normal limit. Physician reference was sought. Oral hypoglycaemics were stopped and patient shifted to regular insulin. Dexamethasone coverage was done to facilitate fetal lung maturity. Following injection dexomethasone patient developed diabetic ketoacidosis. She was shifted to intensive care unit. Her ultrasonography was done which showed polyhydramnios (AFI =25), fetus was found to have left sided congenital diaphragmatic hernia, with classic midline shift of heart to the right with herniation of intestine and spleen. Patient was induced with syntocinon and delivered per vaginally a male baby of 2.8 kg with respiratory distress with early onset sepsis and hypoxic ischemic encephalopathy grade I. X ray and Arterial blood gas (ABG) analysis of the baby was performed in which mediastinum was found to be shifted to right side. Left sided loop of intestine was seen in the chest cavity. ABG revealed respiratory acidosis. Thus diagnosis of diaphragmatic hernia was confirmed. Laparotomy with transabdominal repair was planned and baby was operated on the second day of life. Per operatively, spleen and intestinal loops were found herniating into the chest cavity. Post operatively baby could not maintain the saturation, died due to cardio pulmonary arrest on second post op day. Following delivery patient's blood glucose and blood ketones returned to normal. Insulin was stopped and patient was shifted to oral hypoglycaemic drugs. The patient was discharged on fifth post operative day and counselled for regular follow up.

Figure: 1. Pre-operative X-Ray of the neonate.

DISCUSSION

In this case, the patient was a known diabetic who had an episode of DKA with a neonate born with diaphragmatic hernia.

Diabetic ketoacidosis is a serious metabolic complication of diabetes with high mortality if undetected. Its occurrence in pregnancy compromises both the fetus and mother. The vast majority of DKA occurs in patients whose pregnancy is complicated by pre- existing diabetes mellitus, particularly those who are prone to DKA before pregnancy. Although , more common in type 1 diabetes, it has been recognised in those with type 2 diabetes as well as GDM, especially with the use of corticosteroids for fetal lung maturity and

beta 2 agonists for tocolysis. [3] The exact rate of maternal mortality due to this condition is unknown, but previous reports suggest it to be 4 – 15%. [4] A retrospective survey conducted by Rodgers and Rodgers to identify the precipitant of DKA in pregnant women, reveal non compliance to be the cause in 17% and a contributory factor in a further 25%. [5] DKA in pregnancy is an emergency that demands prompt and vigorous treatment in a high dependency unit under combined medical and obstetrics care to reduce the fetal and maternal mortality. Education of patients aimed at improving their understanding of the risks of pregnancy and requirement for successful outcome must be emphasised during each visit.

CDH occurs when the diaphragm is incompletely formed and the abdominal contents herniated into the chest. Infants with CDH often have additional birth defects, including chromosomal abnormalities. Incidence of chromosomal abnormalities in pre -gestational diabetes mellitus is about 10%, but association of CDH with GDM is rarely seen or reported, may be coexistent condition or may have some relation with diabetes. Most diaphragmatic hernia occurs on left side of body called as Bochdelk hernia with incidence of one out of 2,200 to 5000 live births. Invasion of chest cavity by abdominal content leads to lung hypoplasia and pulmonary hypertension thus increasing the mortality. Factors that may increase the risk of CDH include chromosomal syndrome, maternal alcohol use, and pre gestational diabetes. Diagnosis of CDH is made by chest X - Ray, ABG, Blood test for chromosomes and echocardiogram. The ideal time to repair a CDH is unknown. Some authors suggest that repair 24 hours after stabilization is ideal, but delays of up to 7 – 10 days are typically well tolerated, and many surgeons now adopt this approach. Other surgeons prefer to operate on these neonates when normal pulmonary artery pressure is maintained for at least 24 – 28 hours based on echocardiography.

CONCLUSION

While the outcome of diabetic ketoacidosis in pregnancy has improved over the years, significant maternal and fetal mortality still remains. Prevention, early recognition and hospitalisation and aggressive management remain the cornerstones to minimise the outcomes of this dreaded complication. The occurrence of CDH in pre gestational diabetes has not been reported till date. Therefore, occurrence of this anomaly needs further study.

Summary:

We are reporting a case of a mother with pre gestational diabetes, who had an episode of diabetic ketoacidosis in the third trimester of pregnancy and who delivered a neonate with CDH. This case considers two rare manifestations occurring in a patient with pre gestational diabetes.

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