

Diabetes mellitus in pregnancy and obstetrics outcome

Eva Febia and Rajuddin

Department of Obstetrics and Gynecology, Faculty of Medicine Universitas Syiah Kuala, Banda Aceh, Indonesia.

Abstract. Diabetes mellitus in pregnancy was associated with maternal and neonatal mortality and morbidity. This paper was purposed to assess the several cases of diabetes mellitus in pregnancy that were managed in Zainoel Abidin Hospital, Banda Aceh. There were ten cases of diabetes mellitus in pregnancy in Obstetrics Department Zainoel Abidin Hospital, Banda Aceh. Obstetrics outcomes were noted which include cesarean section, fetal distress, macrosomia, intra uterine fetal death, neonatal hypoglycemia, and neonatal death. We also explained patophysiology of diabetes mellitus in pregnancy, delivery, obstetrics complications, and neonatal complications. It was concluded that diabetes mellitus in pregnancy was associated with increased rate of obstetrics and neonatal mortality and morbidity

Keywords: diabetes mellitus, fetal distress, macrosomia, neonatal hypoglycemia

Introduction

Abnormalities in carbohydrate metabolism occur in pregnancy as the impact of glucose intolerance. They manifest as gestational diabetes which is defined as glucose intolerance with onset or first recognition in pregnancy or carbohydrate intolerance of varying severity which is diagnosed in pregnancy and may or may not resolve after pregnancy. It includes women with unknown pre-existing diabetes, particularly type 2 diabetes mellitus. Diabetes in pregnancy results in maternal consequences as well as fetal consequences. Maternal consequences of diabetes in pregnancy include preeclampsia, infection, post partum bleeding, and cesarean deliveries. Fetal consequences of diabetes in pregnancy include congenital abnormalities, hypoglycemia, hyperviscosity syndrome, hyaline membrane disease, macrosomia, hypocalcemia, apnea and bradycardia, traumatic delivery.

This paper was purposed to review the cases of diabetes mellitus in pregnancy in Zainoel Abidin Hospital in 2012 and its maternal as well as neonatal outcome. We assessed each cases and did literature review to understand the patophysiology of diabetes mellitus and its impact on mother and fetus.

Materials and Methods

We reviewed 10 cases of diabetes mellitus in pregnancy. The subjects were pregnant women who came to Zainoel Abidin Hospital, provincial referral and teaching hospital in Banda Aceh in 2012. There were three cases Intra-uterine Fetal death, one of three cases occurred in Mrs, 30 years old with diabetic ketoacidosis with severely uncontrolled diabetes mellitus and severe preeclampsia. She was G2P1 in 28 weeks of gestation age, came unconscious and was treated in Intensive Care Unit for nine days. Because her fetus was already dead, we delivered the baby by inducing the pregnancy. After delivering the baby and stabilizing her condition she was allowed to go home after being treated in our hospital for 16 days. There were seven cases of cesarean section, one case was elective cesarean section due to macrosomia, two cases were emergency cesarean sections due to fetal distress, two cases were emergency cesarean section due to macrosomia in labor, two cases were emergency cesarean section due to worsening severe preeclampsia and macrosomia. All babies from cesarean section cases were treated in neonatal intensive care unit. Two babies suffered from severe asphyxia due to fetal distress and meconium aspiration, one baby suffered from hypoglycemia, one baby suffered from light asphyxia due to hyaline membrane disease.

There was one case of diabetic cardiomyopathy in Mrs Y, 34 years old who underwent cesarean section due to uncontrolled hypertension in severe preeclampsia and uncontrolled blood sugar in type 2 diabetes mellitus. After cesarean section, this woman experienced severe dyspneu, failing of her heart, treated in Intensive Cardiac Care Unit. Diabetes mellitus in pregnancy accelerate end-organ damage in this patient, which required intensive testing and therapeutic procedure. From seven cases of cesarean section cases, there was one wound dehiscence which needed further wound treatment.

Results and Discussion

There were ten cases of patients with diabetes mellitus in pregnancy who came to delivery room Zainoel Abidin hospital. All of them came with uncontrolled blood sugar with elevated concentration of hemoglobin A1C. All of them came with maternal and neonatal complication which needed further therapy such as cesarean section and intensive care treatment. Diabetes in pregnancy always result in adverse pregnancy outcome. According to Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study which included more than 25.000 pregnancies at 15 centers in nine countries, there was strong and continuous association between maternal glucose level, fetal birth weight, and adverse pregnancy outcome.

Diabetogenic effects of pregnancy culminate in third semester which results because of increased insulin resistance in third semester. Increased insulin resistance was due to production of human placental lactogen, increased production of cortisol, estriol, and progesterone, and increased insulin destruction by kidney and placenta. Diabetogenicity also results from increased lipolysis in which mother utilizes fat for her caloric needs and saves glucose for fetal needs as well as changes in gluconeogenesis where the fetus preferentially utilizes alanine and other amino acids, depriving the mother of a major neoglucogenic source.

Macrosomic fetus whose mother is diabetic has shoulder and trunk pad which is relatively larger than the head, favoring shoulder dystocia at the time of birth. It results also in traumatic delivery and increased rate of primary cesarean section as well as emergency cesarean section of the mother. After birth neonatal complication includes neonatal hypoglycemia, neonatal respiratory distress syndrome secondary to hyaline membrane disease. Neonatal hypoglycemia is secondary to excessive insulin production by newborn's pancreatic beta cells which are enlarged and hyperactive as a result of maternal hyperglycemia. Fetal hyperglycemia is responsible cause of fetal arterial hypoxemia, hyperinsulinemia, increased fetal oxygen consumption, respiratory acidosis, and increased glucose-lactate uptake. If severe fetal hyperglycemia occurs, it may result arterial hypoxemia, hypoinsulinemia, increased erythropoietin, hyperviscosity syndrome, increased fetal oxygen consumption, metabolic acidosis, decreased placental perfusion which eventually leads to fetal demise.

From the pathophysiology of diabetes in pregnancy, it can be stated that maternal and neonatal complication tends to occur. In our center, diabetes in pregnancy resulted in intra uterine fetal death, neonatal hypoglycemia, increased rate of cesarean section, fetal distress, secondary infection of cesarean section wound dehiscence, as well as post partum cardiomyopathy of mother. Diabetes in pregnancy needs special and collaborative management from obstetric management which includes fetal surveillance, endocrine management which includes regulation of blood glucose, as well as intensive care surveillance which prevent further organ damage.

Conclusions

It has been stated that diabetes in pregnancy put the mother and fetus at high risk of complication such as cesarean section, intra uterine fetal death, neonatal hypoglycemia, severe preeclampsia, post-partum cardiomyopathy as well as infection of cesarean section wound. It needs collaborative approach from obstetrics management, endocrinology, cardiology, anesthesiology, intensive care, as well as perinatal management collaborative support for the care of diabetes in pregnancy.

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