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Orignal Article

To Associate the Fetal Distress, Intrauterine Death and Intrauterine Growth Retardation Observed in Normal, Diabetic and Hypertensive Pregnancies

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ABSTRACT

Placental insufficiency is failure of placenta to supply nutrients to fetus and to remove toxic waste. **Objective**: To associate the fetal distress, Intra uterine death (IUD) and Intrauterine growth retardation (IUGR) observed in normal, diabetic and hypertensive pregnancies Methods: It was a Cross-sectional study with non-probability purposive sampling was conducted at Institute Basic Medical Sciences, Dow University of Health Sciences, Karachi. The patients were identified and selected through OPDs of two different hospitals in public and private sector. A total of 150 patients were selected, on the basis of history and clinical examination they were divided into three groups, Control (A), Diabetic (B), and Hypertensive (C), each having 50 individuals. Ultrasound and cardiac tocography (CTG) for all patients were carried out. The newborn was examined most of the time by a doctor from pediatric ward and, APGAR scoring recorded at 1st min, 5th min and 10th min of birth. The data was entered and analyzed on SPSS version 16.0. Mean ± standard deviations were computed for the quantitative variables like Apgar score, by using ANOVA. P-value was determined at 95% confidence interval and <0.05 taken as significant. Qualitative variables such as fetal distress, IUGR and IUD were presented by frequencies and percentages **Results:** Fetal distress was highest 46% in hypertensive group(p-0.005). IUGR was seen highest 6% in hypertensives(p-0.005). IUD was observed 10% in diabetic group (p-0.005). Results found by ultrasound scans were 92 % normal in control group, 68 % in hypertensive and 54 % in diabetic group. Mean APGAR score of baby in 1 minute was same in all the three groups **Conclusion: T**here are more number of cases with poor outcome of pregnancy in diabetic and hypertensive as compared to control group.

INTRODUCTION

Placental insufficiency is a complication of pregnancy where the growing placenta cannot bring enough nutrients to meet its needs [1]. Placental insufficiency is a common cause of intrauterine growth retardation (IUGR), fetal distress, perinatal and postnatal morbidity and mortality. The reason for this in some cases is unknown but in others it is strongly associated with diabetes, hypertension, viral infection and smoking. A massive increase in the intensity of fetal monitoring and changes in the method of delivery including increased use of caesarean sections have not decreased the incidence of poor fetal outcome, leading to high risk in obstetrics. Gestational diabetes mellitus (GDM) is defined as glucose intolerance that begins or is first detected during pregnancy [2,3]. More or less 7% of pregnancies are complicated by GDM, and it is important to rule out GDM as it leads to maternal and fetal complications. It has been seen that treatment with medical, nutritional and insulin therapy and timely monitoring of glucose levels

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reduces the complication associated with the condition [4]. According to WHO criteria for the diagnosis of the gestational diabetes mellitus, with 75 grams OGTT, 126 mg/dl fasting and 140 mg/dl 2hrs post-parandial is labeled as GDM [3,5]. The maternal and hormonal metabolic alterations associations with GDM profoundly modify the in-utero environment, leading to an abnormal pattern of fetal growth [6]. Impaired fetal development has severe metabolic consequences with increased risk to develop glucose intolerance and obesity in adolescence and later life [7]. It is a proven fact by different studies that pregnancy is a diabetogenic condition having insulin resistance which usually becomes prominent in second trimester. Despite being one of the leading causes of maternal death and major contributor of maternal and perinatal morbidity, the mechanisms responsible for pathogenesis of pregnancy induce hypertension are unclear. It develops during pregnancy and remits after delivery [8]. Pregnancy induced hypertension (PIH) not only elevates obstetric morbidity and mortality, but also places the mother at increased risk for developing cardiovascular disease (CVD) later in life. Indeed, subjects with PIH are susceptible to hypertension, obesity, metabolic syndromes and to CVD particularly if preeclampsia is complicated by preterm birth [9-11]. Fetal growth restriction leads to birth of low weight babies who later in life developed pregnancy induced hypertension [12]. The sample size of this study is larger than the previous studies and subjects from various socioeconomic origin are selected to establish association between the diseases and its effects.

METHODS

A cross sectional study with Non-probability, purposive sampling was done. The population of interest in this study is human subjects. A total of 150 patients that comprised of 3 groups Control (A), Diabetic (B), and Hypertensive (C), having 50 subjects in each group. In a period of 2years that is 2008-2010. The ethical considerations according to the institutional review board of Dow University were met. The patients were identified and selected through OPDs of two different hospitals in public and private sector (National Medical Center Kalapul Karachi and Jinnah Postgraduate Medical Center Ward-9 Karachi). A detailed history was taken from them which included their age, social background, gravidity, parity, abortion or still birth, and their past medical, obstetric and family history. After that, clinical examination was done specifically blood pressure, pulse rate was done. A detailed obstetric clinical examination that included height of fundus (HOF), fetal heart Sound (FHS), and fetal movement (FM) etc was carried out. Further, laboratory investigations were done for random blood sugar, also ultrasound and cardiac tocography (CTG) for all patients, was carried out. The newborn was examined most of the time by a doctor from pediatric ward and APGAR scoring recorded at 1st min, 5th min and 10th min of birth. Full term pregnancies (37-40 weeks gestation) were included while those below 36 weeks (premature) and above 40weeks (post mature) were excluded in the study. Diabetic group patients were closely monitored to make sure that they are not complicated by any other clinical condition such as hypertension, viral infection etc. Similarly, hypertensive group was made sure not to have any other complications. Extreme maternal age that is <17 or >42 were excluded from this study. Multiple pregnancies were excluded. The data was entered and analyzed on SPSS version 16.0. P-value was determined at 95%confidence interval and <0.05 taken as significant. Qualitative variables were presented by frequencies and percentages according to the study group.

RESULTS

Outcome of pregnancy: Fetal distress was highest 46% in hypertensive group, and 14% in diabetic group where as it was only 2% in normal group. IUGR was seen highest in hypertensive that is 6%. Whereas, normal and diabetic groups showed no IUGR. IUD was observed more in diabetic group that is 10%, while it was only 2% in hypertensive group (Table 1). Alive healthy outcome of pregnancy was found more in diabetic group than hypertensive group (76% vs. 48%)(Table 1).

Ultrasound scans: Normal sonography findings in group "A" n=46(92 %) when compared to group "B" n=27(54%) p-value (0.005) was found to be statistically significant and group "A" n=46 (92 %) when compared to group "C" n=34(68 %) p-value (0.005) appeared statically significant, whereas group "B" n=27(54 %) when compared to group "C" n=34(68 %) p-value (>0.05) is statistically non-significant. Zero percent gestational age non-relevant outcomes were found in the control group while it was same in both diabetic and hypertensive groups that is n=5(10%) in each. Other complications such as IUD, reduced liquor, IUGR, cord around neck and mal positioning were found n=7(14 %) and n=14(28 %) more in diabetic group than hypertensive and control group respectively (Table 2). Results found by ultrasound scans were 92 % normal in control group, 68 % in hypertensive and 54 % in diabetic group.

APGAR score of babies: Average APGAR score one minute after delivery in group "A" (6.01) when compared to group "B" (5.48, p-value 0.113) appeared statistically non-significant, and in group "A" (6.01) when compared with group "C" (5.88, p-value 0.113) it was statistically non-significant. When group "B" (5.48) was compared with group "C" (5.88) p-value (>0.005) again appeared statistically non-significant. Mean

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Apgar score of baby in 1 minute was same in all the three groups (p>0.05). APGAR score was below 7 in 37 babies in control/normal group with 34 and 30 in the diabetic and hypertensive groups respectively. It was also noticed that in 5 babies the APGAR score was zero for diabetic group and it was zero only in one baby for hypertensive group whereas no baby with zero or less than 5 APGAR score was found in the control group(as shown in Table 2)

Outcome of pregnancy f(%)	Normal (A) n=50	Diabetic (B) n=50	Hypertensive (C) n=50	P-value
Alive healthy	49(98)	38(76)	24(48)	0.005
Fetal distress	1(2)	7(14)	23(46)	
IUD	0(0)	5 (10)	1(2)	
IUGR	0(0)	0(0)	3(6)	

Table 1: Association of different variables with study groups

	Study Groups		
Ultrasound scan	Normal (A)(%) n=50	Diabetic(B)(%) n=50	Hypertensive(C)(%) n=50
Normal	46(92)	27(54)	34(68)
Gestational age non - relevant	0(0.0)	5(10)	5(10)
other complications	4(8)	18(36)	11(22)
APGAR score of baby in 1 minute			
<7	37(74)	34(68)	30(60)
>=7	13(26)	16(32)	20(40)

Table 2: Frequency Distribution of various variables according to the study groups

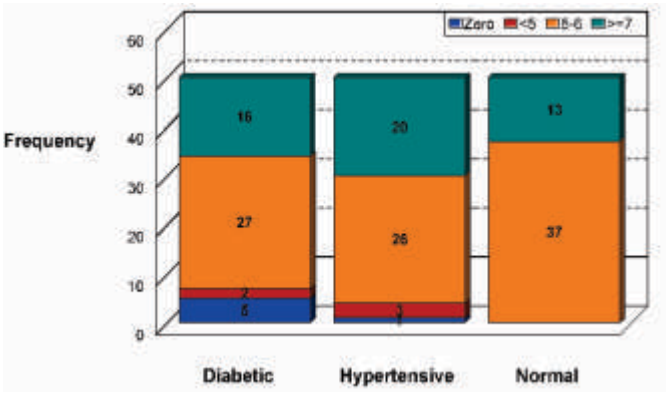

Figure 1: Frequency Distribution for APGAR score in 1 minute according to the study groups

DISCUSSION

In our study there was a positive association between hypertension and adverse fetal outcome. There was a total of 46% babies in hypertensive group with fetal distress. Fetal growth restriction and pregnancy induced hypertension complicate significant number of pregnancies [13]. The patients of hypertensive group were selected by purposive sampling they showed high blood pressure levels, but the other two groups showed lower readings, as they were scrutinized specifically for hypertension. Hypertension is one of the factors that complicates pregnancy and results in maternal and fetal death [14]. In a study done by Marina Kos on hypertensive placenta it was seen that those pregnancies were already associated with diagnosis of intra uterine growth retardation [15]. Our findings are consistent with the work done by Marina Kos. Fetal and maternal complication as seen in GDM, include macrosomia, neonatal hypoglycemia, perinatal mortality, congenital malformation, hyper bilirubeniemia, polycythemia ,hypocalcaemia and respiratory distress syndrome [16,17]. Which lead to fetal morbidity at delivery; in our study 14% of diabetic cases shown fetal distress while 10% had congenital anomalies or IUD making a total of 24%. Though many advances in medical cure are developed but diabetes and hypertension still remain as threats to pregnancies. So, our study shows a positive association with the work done before. Our study also showed 10% cases with small for gestational age babies in hypertensive group, and 22% with other abnormalities. Hypertensive pregnancies are associated with an increase in the frequency of premature births, IUGR, perinatal morbidity and mortality as a consequence of intrauterine hypoxia. 18 With this the rate of neonatal mortality became five times greater [19]. Fetal distress, IUFD and placental abnormalities are common in pregnancy induced hypertension. A study done by Majumdar S & co-workers, Babies of mothers with poorly controlled PIH were mostly small for dates [20]. So, our findings are similar to this study. Our study showed almost 60 % of hypertensive had babies with Apgar score less than 7. Apgar score of babies of mothers having PIH was less than 7 as discussed by Majumdar S and co-workers [20]. This is consistent with our findings.

CONCLUSION

It is concluded by this study that there is comparatively poorer outcome of pregnancy in diabetic and hypertensive as compared to control group. The fetal distress IUD and IUGR are seen in pregnancies which are associated with diabetes and hypertension more frequently.

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