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ORIGINAL ARTICLE

Prevalence of Gestational Diabetes (Type 2 Diabetes) and Their Risk Factors in Pregnant Women of Khairpur Mir's Sindh, Pakistan

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ABSTRACT

Introduction: Diabetes affects 415 million individuals globally, with 193 million undiagnosed diabetics. Type 2 diabetes affects more than 90% of diabetic patients. It causes microvascular and macrovascular problems that cause significant psychological and physical discomfort in both patients and caregivers and a significant financial burden on healthcare systems. Despite growing awareness of type 2 diabetes risk factors and evidence of effective preventative programmes, the disease's incidence and prevalence continue to climb globally.

Methods: In this study, a population-based investigation was made among 60 pregnant women's belonging to two different age groups ranges (18-38) and (36 to 45) and associated risk factors of the diabetes type 2 were screened out at Kausar Hospital, Khairpur city and Mehran Lab Khairpur, Sindh, Pakistan.

Results: Results of this study revealed 31 (52%) positive cases and 29 (48%) negative cases of Diabetes type 2 using manual micro lab procedure and glucometer (Random and Fastening Glucose test). Glucometer. Furthermore, our study also revealed that 80% of positive cases were also experiencing various infections, whereas 20% were without any infection, Similarity 55% of the cases were also had their genetic-based Diabetes, whereas 45% caught this during their gestation period and 47% showed anger and 53% of the woman were in stress.

Conclusion: Our study suggests that Maternal and fetal monitoring is required to minimize maternal and fetal /neonatal morbidity and perinatal mortality. After delivery, all women with GDM must be reevaluated as to their glucose tolerance by a 75 g OGTT (WHO criteria).

Keywords: Gestational Diabetes type 2, Glucometer, Frequency, Prevalence, Khairpur mirs.

INTRODUCTION

Diabetes mellitus is, also known as "sugar is a chronic, non-communicable disease" that has emerged as one of the most serious global health issues. It is caused due to pancreatic failure to produce insulin hormones resulting in hyperglycemia (increased blood glucose levels) (WHO.2014: N.H.CHO.2018).DM is a complex illness caused by abnormalities in insulin secretion, insulin action or both. It is referred to as incurable high blood glucose and problems in carbohydrate, protein, and lipid metabolism (WHO:2011). Diabetes type 2 has affected both elderly and the young and is strongly linked to morbidity, morality, and a high health care cost for individuals, families, and countries (Nwaokoro et al.,2014). Gestational diabetes mellitus is a simple type of diabetes that manifests itself in glucose intolerance that appears during pregnancy (Metzger et al.,1998). Gestational diabetes develops throughout pregnancy and disappears once the baby is born (RSSDI., 2012).

Type 2 diabetes mellitus (T2DM) is a growing global health issue intimately linked to the obesity epidemic. Because of hyperglycemia and individual components of the insulin resistance syndrome, people with T2DM are at significant risk for both microvascular consequences such as cardiovascular abnormalities and macrovascular problems such as stroke, obesity, a poor diet, and physical inactivity, as well as an environmental and hereditary variable all contribute to the various petrophysical abnormalities that caused impaired glucose homeostasis in T2DM. T2DM is still characterized by insulin resistance and decreased insulin production that leads to glucose metabolic dysregulation. To maintain normoglycemia, numerous antidiabetic medications are required in T2DM. Treatment must be successful and safe because it improves patients' quality of life. Several new medications are being developed, but the most significant need is a drug that improves insulin sensitivity (Defronze et al.,2015).

Although hyperglycemia that develops during pregnancy and resolves after birth has been known for more than 50 years, there is no universal agreement on the threshold hyperglycemia levels that warrant a diagnosis of gestational diabetes mellitus (GDM) and therapy during pregnancy. The most prevalent medical consequence of pregnancy is gestational diabetes, and the prevalence of undetected hyperglycemia and even diabetes in young women is on the rise (Kjos and Buchanan 1999). Major GDM risk factors include maternal overweight and obesity, later age of the childbearing, previous history of GDM, family history of type 2 diabetes mellitus and ethnicity. The most common method of diagnosis is an oral glucose tolerance test (OGTT), while in some parts of the world, a non-fasting glucose challenge (GCT) is used to screen women for those who require a full OGTT. The primary treatment for GDM are dietary changes and increased physical activity; however, medication usually insulin is utilized when normoglycemia is not reached. In some countries, oral hypoglycemia medications such as metformin and glibenclamide (glyburide) are also utilized. Treatment improves pregnancy outcomes by lowering foetal growth and obesity and pregnancy-related hypertension problems. In both the mother and newborn,

GDM raises the risk of long-term problems such as obesity, poor glucose metabolism and cardiovascular disease with limited preventive intervention in most parts of the world (Mclntyre et al.,2019). GDM in women causes various impacts on the mother's health on the newborn maternal hyperglycemia can cause foetal macrosomia, newborn respiratory distress syndrome, cardiomyopathy, hypoglycemia, hypocalcemia, hypomagnesemia, polycythemia, and hyperviscosity (Jone and Carolyn2017). Insulin resistance is linked to a decrease in a post-receptor insulin signaling cascade in normal glucose tolerance pregnancy, specifically, decreased insulin receptor substrate one tyrosine phosphorylation during gestational diabetes, and there is no significant improvement in insulin sensitivity in post-partum women with GD who kept their prenatal weight gain and increased inflammation as measured by plasma and skeletal muscle tumor necrosis factor-alpha (Catalano 2013).

METHODOLOGY

The current study was conducted for three months, from October to December 2020, in the outpatient department (OPD) of Kausar Hospital Khairpur city and Mehran Laboratory Khairpur, Sindh, Pakistan. The study comprised 60 women who were diagnosed with diabetes type 2 during pregnancy by sample collection. A standardized questionnaire was utilized to collect data on age, gender, race/ethnic origin, education, family income, body weight and height, as well as complications of gestational diabetes type 2. The sampled population was separated into two age groups. 18–35 years old. Age bracket of 36 to 45 years. At the time of presentation, patients' names, ages, diabetes mellitus type 2 during pregnancy, symptoms, duration, and any previous therapy were gathered. The ethical council of Shah Abdul Latif University, Khairpur, Sindh, Pakistan, accepted the study, which used a standard OGTT with 75g anhydrous glucose. The FPG and 2hPG were determined using a validated glucometer (Ultra 2; Johnson and Johnson, New Brunswick, NJ). The glucose oxidase technique was used to estimate venous plasma glucose in every tenth case (Autoanalyzer 902; Hitachi, Tokyo, Japan). Correlation values for FPG and 2hPG were 0.94 and 0.81 for glucometer and laboratory techniques, respectively. Diabetes mellitus was diagnosed using WHO 1999 criteria. HbA1c levels were determined using blood taken in EDTA vials and estimated using the Bio-Rad 10 system (Bio Rad, Hercules, CA) based on HPLC-based ion exchange chromatography.

Analyses statistical: The data was analyzed using the Microsoft Office application.

RESULT

Sixty patients were found Diabetes type 2 patient in Kausar Hospital, Khairpur city and Mehran Lab Khairpur, Sindh, Pakistan. Our results show frequency of prevalence of (31) 52% of the Diabetes in the females having age ranged between 18 to 35 and having a frequency of 29(48%) in the age group of females between 36 to 45 as shown under table no. 01. The various symptoms of Type 2 Diabetes in pregnant women showed different signs as 58% of women feel appetite, and 42% feel thirst during pregnancy are given under table 02. The behaviour changes also occurred in pregnant women with Type 2 Diabetes in which 47% of patients behave angrily during the daytime while 53% feel much stress during pregnancy are shown under table 03. Whereas 55% of pregnant women had diabetes type 2 by genetic transmission, 45% had diabetes type 2 during the gestational period, as shown under 04. While 57% of T2D patients take proper medication while 43% of diabetic type 2 patients do not take medication, as shown under table 05. 80% of diabetic type 2 pregnant women have infection early or lately in the foot, hand, finger, etc., while 20% are non-infection, which means they do not have the infection during Type 2 Diabetes are shown under table 06.

Table 1: Age wise frequency of Diabetes type 2 frequency.

Age wise group	Frequency	Percentage
18-35	31	52%
36-45	29	48%
Total	60	100%

Table 1. shows age wise distribution of patients of Diabetes type 2 in percentage of women. While table show age of group (18-35) has 52% of diabetes type 2 in pregnancy and age group (36-45) has 48% of diabetes type 2 during pregnancy(GDM).

Table 2: Occurrence of symptoms of Diabetes type2 in pregnant women

Symptom	Frequency	Percentage
Appetite	35	58%
Thirst	25	42 %
Total	60	100 %

Note this Table 2. Shows that 58% of pregnant women during Diabetes type 2 feel appetite, 42% of pregnant women feels thirst during diabetes type 2. This table no: 2 shows the symptom of patients regarding appetite and thirst.

Table 3: Behavior of pregnant women having diabetes type 2

Behavior	Frequency	Percentage
Angry	28	47%
Stressed	32	53%
Total	60	100%

Note here table 3. Shows the behavior of pregnant women in diabetes type 2 in which 47 % patients behave angry during their day, 53% of pregnant women feels much stress during pregnancy. The table 3 shows the behavior of pregnant women during diabetes type 2.

Table 4: Transmission of diabetes type 2 in pregnant women

Transmission of diseases	Frequency	Percentage
Heredity	33	55 %
During Pregnancy	27	45 %
Total	60	100 %

Note this Table 4 shows 55% of pregnant women who had get Diabetes type 2

Table 5: Percentage of cure T2D in pregnant women

Cure for diseases	Frequency	Percentage
Proper medication	34	38 %
No medication	26	43 %
Total	60	100%

by genetic transmission, white 45% had Diabetes type 2 during gestational period.

Note this table 05 shows 57 % patients of Diabetes type 2 patients take proper medication, while 43% of Diabetes type 2 patients do not take medication.

Table 6: Occurrence of infection in T2D in pregnant women

Endemic	Frequency	Percentage
Infection	48	80 %
Non – infection	12	20 %
Total	60	100 %

Table 6. Shows 80 % of Diabetes type 2 pregnant women have infection early or lately in foot, hands, fingers, etc. While 12 % are non-infection that means they do not have infection during Diabetes type 2.

DISCUSSION

Diabetes type 2 has acquired its diagnostic importance as glucose intolerance with onset recognition during pregnancy. The offspring of mothers experiencing GDM are at a higher risk of intrauterine death or neonatal death if they are not diagnosed and treated promptly. However, perinatal mortality for infants of women maintaining good glycemic control may not be higher than that in the general population. It is thus essential that all pregnant women be screened for glucose intolerance as selective screening of high-risk cases proves inadequate. Systematic screening of gravid women is still not common in Pakistan. In addition to the lack of awareness among health professionals and cost factors, an important reason for this is that many women deliver at home with the help of traditional birth attendants. Some larger hospitals have instituted the tests as an essential part of their antenatal clinic services. Every registrant, excluding established diabetics, is screened for glucose intolerance at the Aga Khan Maternity Home, Karimabad, Karachi. Running over three years, this study diagnosed and managed 3.45% of the total delivery cases as GDM. This figure is comparable to a similar study by (Khan et al., 2001)in 1988-1989 at the Aga Khan University Hospital, where they obtained a figure of 3.2%. Another study done in Kuwait by Johnstone et al. in 1985 gave results of GDM being present in 3.1% of all deliveries. The screening for GDM in the Aga Khan University Hospital was done by subjecting the gravid woman not known to be diabetic before the onset of pregnancy to a 75 g glucose challenge test on the first antenatal visit, irrespective of the gestational age. Fasting was not required. A dose of 75 g glucose was dissolved in 300 ml water and administered orally over a 5minute period. A single venous blood sample was obtained 2 hours later to determine the plasma glucose. If the result was >140 mg%, then a formal 3hour oral glucose tolerance test (OGTT) with a glucose load of 75 g was performed. The diagnostic levels were based on the modified O'Sullivan's criteria. Plasma glucose values of >105 mg%, >186 mg%, >140 mg% and >122 mg% for the fasting, 1-hour, 2-hour and 3-hour samples, respectively, were regarded as abnormal. Two abnormal values were required to establish GDM. In our study, pregnant women with GDM were allowed to go into spontaneous labour at term unless an elective caesarean section had to be performed due to an unusual obstetric indication. Emergency caesarean section was undertaken mainly in cases of fetal distress. The outcome of the pregnancies was encouraging, with the perinatal loss being only 2.08% during the three years. A review of the outcome of pregnancies in women with normal glucose tolerance in the same period gave a figure of 2.0% loss. Eighteen females with preexisting diabetes mellitus delivered in these three years. The loss encountered in this group was 16.6%. The figure for neonatal and intrauterine deaths from the Kuwait study was 12.4%. This high loss rate may be attributed to the high prevalence of type II diabetes in cases discovered in pregnancy. Many women were diagnosed in early pregnancy, indicating that preexisting diabetes had not been recognized earlier. This factor, along with poor patient compliance and inadequate monitoring and diabetes control and the absence of standardized treatment, may have been the major factors for the high perinatal loss noted in that study. No perinatal mortality was reported by Coustan and Lewis in their study performed in 1973.

The mean birth weight of the infants, 3.33 kg, 3.24 kg, and 3.17 kg, respectively, in the three study years, indicates satisfactory glycemic control during pregnancy. This compares well with the Coustan and Lewis study, where the mean birth weight was recorded as 3.6 kg. The study may conclude that early screening of pregnant women gives an early diagnosis of GDM. Good management, close monitoring and patient compliance give a satisfactory outcome for an infant of average weight, low incidence of perinatal losses and natural at-term delivery.

CONCLUSION

This research concluded that the ratio of diabetes type 2 in pregnant women of age group18 to 35 is greater than the ratio of diabetes type 2 in pregnant women of age group 36 to 45. As a result of primary data maximum ratio of the age group, 18 to 35, was observed as 52 %, while the ratio of age group 36 to 45 was observed as 48 %. The age-wise comparison of age group 18 - 35 showed that most reported cases of diabetes type 2 in pregnant women was in the 18-35 age group with a total ratio of about 100 %. By preventing or delaying problems, early detection through screening programmes and the availability of safe and effective medicines minimizes morbidity and mortality. The result of this study will be helpful for the spread of awareness among people of District Khairpur, Sindh, Pakistan.

Recommendations: Eating a healthy diet is essential when you have type 2 diabetes. In fact, for some people, a healthy diet and exercise are enough to keep their blood sugar under control. When pregnant, it's especially crucial to make sure your blood sugar is at an appropriate number. Consult with your doctor about whether a meal plan is necessary to help you and your baby get the essential nutrients while keeping your blood sugar at appropriate levels. Food to choose from includes fruits, vegetables, whole grains, beans, legumes, chicken, fish, low-fat dairy products. If you begin at an average weight for your height, the expected weight gain is between 25 and 35 pounds. Fasting and postprandial self-monitoring of blood glucose is recommended in diabetes type 2 during pregnancy to achieve glycemic control. In pregnant patients with type 2

diabetes, blood pressure targets of 120 - 160 / 80 – 105 mmHg are suggested to optimize long-term maternal health and minimize impaired fetal growth.

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