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An Investigation on the Prevalanceof Gestational Diabetes Mellitus in the Pregnant Women of Province Balochistan

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Abstract: Gestational diabetes mellitus (GDM) is a condition during pregnancy in which glucose intolerance appears. It is the most common health problems in pregnant women. Definite consequences in previous pregnancies are considered as risk factors for GDM in the succeeding pregnancies. The aims and objectives of this study were to determine causes and risk factors of Gestational diabetes mellitus (GDM) and its prevalence in Balochistan. A descriptive research study was conducted to study the prevalence of GDM and factors affecting GDM. A total of 139 participants were included in the study. The prevalence of GDM was 22%, Out of 139 study participants 31 were affected individuals. The most common risk factors for GDM were maternal age, Qualification, Ethnicity, Maternal occupation, consanguineous marriages, Familial history, Obesity, Height, BMI and age at time of marriage. Obesity was the most common causing factor for GDM among other factors.

Key words: Gestational Diabetes Mellitus (GDM) · Diabetes · Pregnancy · Glucose Intolerance

INTRODUCTION

Gestational Diabetes Mellitus (GDM) is such a condition during pregnancy in which glucose intolerance is found. It progresses during pregnancy and ends after pregnancy. The occurrence of GDM in United States reached to14% of all pregnancies and its level is continuously increasing in multi-ethnic populations [1].

According to American diabetes association, 14 % of pregnancies turn complicated due to Gestational diabetes mellitus. It stood to be a potential reason for maternal mortality rate. Belgian researcher J.P. Hoet published a study on “Carbohydrate Metabolism during Pregnancy” and first used the term “Meta Gestational Diabetes” in 1954. Jorgen Pedersen probably was the first to use the modern term “GD” in 1967. In 1979, the first International Workshop-Conference on GDM was done. Earlier gestational mellitus was defined as “hyperglycemia” first recognized that occur during pregnancy and recently like in 2012 by the American Diabetes Association it was described as during pregnancy diabetes can be diagnosed that is not clearly obvious diabetes. GDM has different health issues for the mother as well as offspring not only in the short term but also in the long term [4].

The common risk factors of GDM are familial history, obesity before pregnancy, high weight during pregnancy, high maternal age, ethnic backgrounds, previous diagnosis of gestational diabetes, impaired glucose tolerance influence women to GDM [5, 6].

Diet plays a vital role in occurance of GDM. During pregnancy biochemical changes produces high lipid content in early gestation jet causes metabolic disorders due to which insulin resistance occurs [7]. Metabolic disorder is defined as the condition which includes central obesity and either of the two factors may be high density lipoprotein cholesterol is reduced due to higher triglyceride levels or increased fasting plasma glucose as well increased blood pressure [1].

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Gestational diabetes mellitus (GDM) is responsible for several maternal and fetal complications including preeclampsia, fetal macrosomia, polyhydramnios, birth trauma, neonatal metabolic problems, perative delivery and perinatal death during childhood the development of obesity and diabetes in offspring and after few times ago the development of diabetes mellitus in mother are also associated with GDM [8,9]. For the purpose of suitable pregnancy results the accurate screening and diagnosis is very important [10].

For the management of GDM Self-care plays an important role. It is commonplace for the diabetes team care to offer the women with education and information in order to facilitate self-care. It contains information about self-monitoring of blood glucose, GDM, advice regarding healthy lifestyle measures post-partum and dietary counseling. Women having GDM must achieve home blood glucose monitoring [11]. During the fasting state and 1–2 hours after meals the blood glucose level are generally examined. Treatment after meal time results in greater pregnancy outcomes as compared to before meal time. Dietary therapy is the keystone of treatment of Gestational diabetes mellitus (GDM). All women with GDM should be recommended by a dietitian specialist. There is sufficient mark in people with type II diabetes that regular physical activity enables weight loss, improves insulin sensitivity and thereby enhances glucose control. In the management of GDM Regular exercise is also beneficial [12].

MATERIALS AND METHODS

A descriptive research study was conducted to study prevalence of Gestational diabetes mellitus (GDM) and studying the factors affecting GDM. A total of four tertiary care hospitals were selected for the study, including Civil Hospital Quetta, Bolan medical complex (BMC) Quetta, Imdad Hospital, Quetta and Jhalawan Hospital of districtKhuzdar. All four hospitals are located in the province of Balochistan, three hospitals were based in district Quetta and Jhalawan Hospital is based in district Khuzdar and provide services 24 hours a day, seven days a week with its all appointed staff including doctors, nurses and interns. An application was written to the medical superintendent of each hospital requesting for the permission to collect data from patients admitted in their hospital and university departmental reference letter was also attached with the application. The families in these hospitals were found to be of different socioeconomic level and life styles which proved advantageous in comparing different factors. After taking informed oral consent from the participants, the data was collected by the help of the questionnaires. A total of 139 participants were included in the study. The complete survey took four months period from June 2014 to September 2014 and a total of 139 questionnaires were filled.

The participants were selected from different families and different backgrounds admitted at the hospital. The data was collected by the help of convenience sampling. Mostly the participants included were mothers aged between 20 to 35 years were admitted in the hospital during the study. History was collected from each participant. Patients, whose data were incomplete or were not satisfactory, were not included in the study to maintain the creditability of data. Those who did not knew about their gestational age, any disease during pregnancy and blood pressure during pregnancy were omitted.

Questionnaire was designed on the basis of different questions. Total 23 questions were included in questionnaire which were asked from patients, inquiring about participant ID, her age, qualification, residence, Occupation, Caste, No of children, Age at time of marriage, current pregnancy, facial complexion, height, weight, BMI, Blood group, Blood pressure, blood sugar level, GDM in previous pregnancy, Physical activity, Familial history of GDM and type II diabetes, Weight before and after pregnancy and Co-morbidities if any.

All questionnaires were written in English. Structured interviews were conducted from each participant in private setting. Participants were given specific code to maintain their privacy. Every question and biological terminologies were well explained to mother before they would come to a conclusion. In case of uneducated mothers, they were not able to explain their conditions during pregnancy then, physicians and nurses were asked for assistance.

Study was not funded by any organization and none of the participants were paid for their participation in the study. Microsoft Excel was used as software for the analysis of the collected data. This software's were used to enter the data collected by the help of questionnaires.

RESULTS AND DISCUSSION

A descriptive research study was conducted to study prevalence of GDM and studying the factors affecting GDM. A total of four tertiary care hospitals were selected for the study, including Civil Hospital Quetta, BMC, Jhalawan Hospital Khuzdar and Imdad Hospital Quetta.

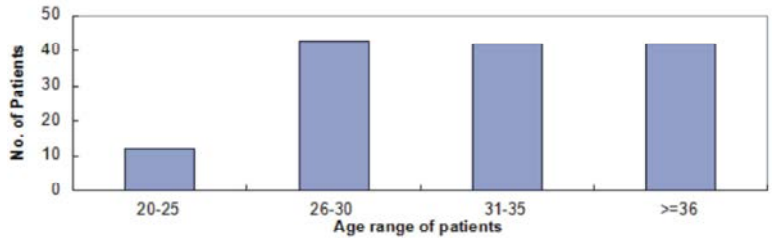


Fig. 1: Showing prevalence of GDM dependent on age

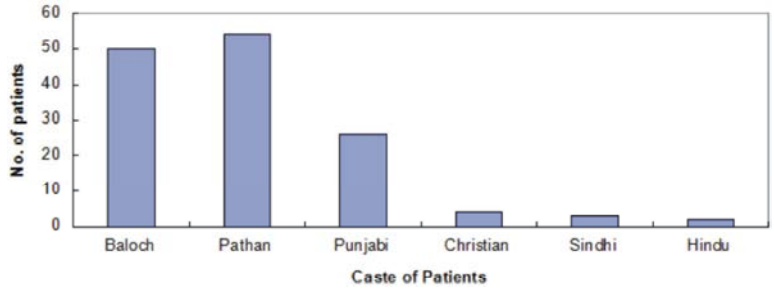


Fig. 2: Showing GDM in different ethnic groups

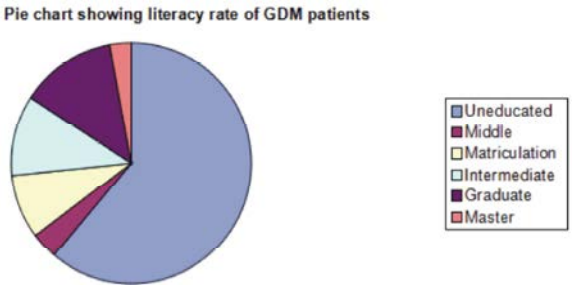


Fig. 3: Showing literacy levels in patients of GDM

All four hospitals are located in the province of Balochistan, three hospitals were based in district Quetta and Jhalawan Hospital is based in district Khuzdar and provide services 24 hours a day, seven days a week with its all appointed staff including doctors, nurses and interns.

Figure 1 depicts the prevalence and age of GDM. The prevalence GDM was 22%, out of 139 study participants 31 were affected individuals and 108 were unaffected with GDM. Increasing age was the most common risk factor of GDM. The result of this graph shows that out of 31 affected participants most affected participant having age = > 35 years that having maximum chances of having GDM. Age having positive correlation with GDM and increasing age have maximum chances of being GDM. The study results were supported by Radhia *et al*. [1], Hoseini*et al*. [6], Soheilykhah *et al*. [10] and Ferrara [13]. As they have concluded that, greater maternal age is the risk factor for causing GDM and also increased risk for Type II DM.

Figure 2 shows the ethnic background of 31 participants included in the study. Due to the selection of location most of the participants were Baloch and Pathan on the basis of results 13 participants were Baloch, 10 were Pathan, 7 were Punjabi and remaining 1 was Sindhi. Our study results were also supported by Sugiyama[2], Soheilykhah *et al.* [10] and Ferrara [13].

The study conducted to analyze various parameter causing and affecting GDM reached to various factors such as qualification were mainly associated with GDM. Figure 3 shows the qualification of 31 participants included in the study. Out of 31 participants 20 were uneducated, 1 participant was in middle category, 9 were intermediate and remaining 1 was graduated. Qualification was negatively correlated with GDM.

This figure showed that most of the participants were house wives because most of them were uneducated so out of 31 participants 23 were house wives, 5 of them were teachers and 3 were nurses.

The study conducted to analyze various parameter causing and affecting GDM determined that various factors such as consanguineous marriages were mainly associated with GDM. Figure 5 shows the consanguineous marriages of 31 participants included in the study. The pie chart shows the result on the basis of consanguineous marriages, 58 % or 18 individuals out of 31 having cousin marriages and remaining 42% had no cousin marriages. Consanguineous marriages had positive correlation with GDM and this shows that diabetes is a genetic disease so it highly influences.

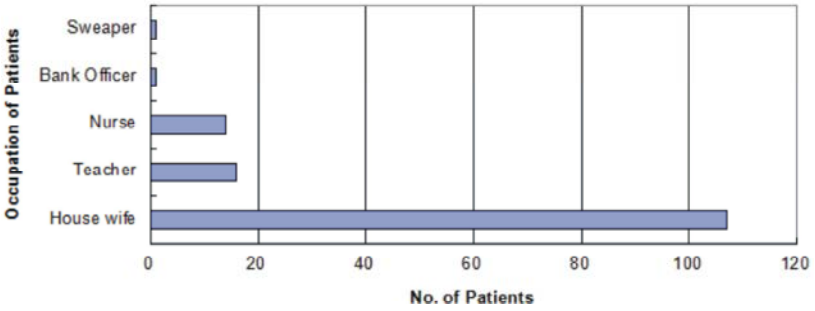


Fig. 4: Showing occupations of patients of GDM

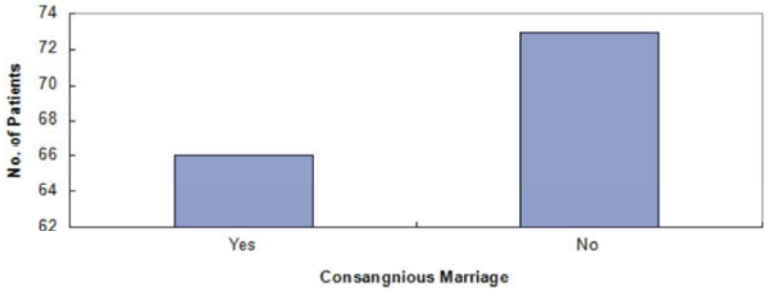


Fig. 5: Showing GDM in consanguineous marriage cases

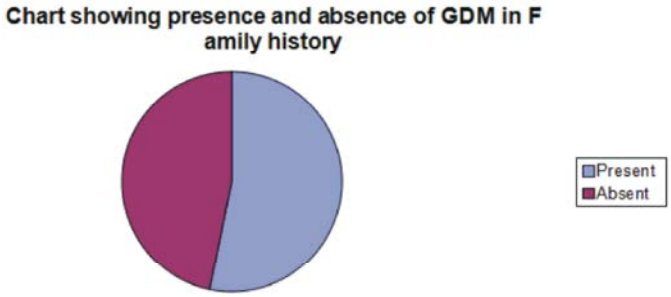


Fig. 6: Showing GDM in family history

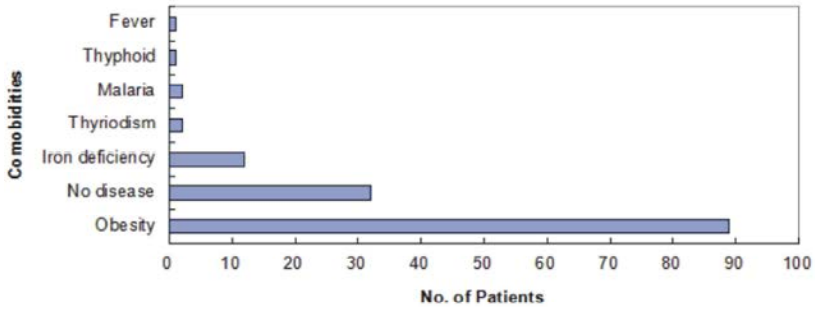
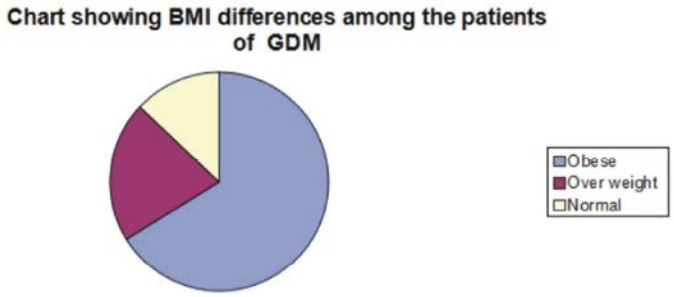


Fig. 7: Showing co-morbidities due to GDM in patients

The above mentioned data showed84% of the study participants had GDM familial history and 16% had no GDM history and its shows that familial history had positive correlation with GDM. With the increase in GDM in family, the chances for GDM are also increased. Our study results were also supported byRadhia *et al*. [1]. As they also have concluded that familial history of GDM is the risk factor of causing GDM.

Figure 7 shows the comorbidities of 31 participants included in the study. Most of the participants had obesity before pregnancy, 65% or 20 individuals were obese and this shows that obesity was the most common factor causing GDM among other factors. Our study results were also supported by Gunderson *et al*. [14] and Kim [15]. As they also had concluded that GDM most likely occur in the woman who are obese.



The study conducted to analyze various parameter causing and affecting GDM determined that various factors such as BMI were mainly associated with GDM. shows the BMI of 31 participants included in the study. BMI is the measure for human body shape based on an individual's mass and height. According to the WHO standards BMI is classified into four categories i.e. Underweight (<18.5), Normal (18.5 - 25), Overweight (25.1 - 30) and Obese (= 30.1). Out of 31 individuals 20 study participants were obese, 9 were overweight and 2 were normal so BMI had positive correlation with GDM. BMI was the main factor causing GDM. Our study results were also supported byRadhia [1] and Kim [15]. As they also had concluded that BMI was the main and causing factor of GDM.

CONCLUSION

The main causing and risk factors of GDM were high maternal age, GDM familial history which waspositively correlated with GDM. With the increase in GDM in family, the chances for GDM were also increased. BMI was positively correlated with GDM. BMI was one of the main factors causing GDM. High maternal weight had large impact on GDM. Obesity was the most common co-morbidity causing GDM among other factors. Consanguineous marriages had more chances to show any type of disease as compare to those which were related with outside family members. The study also concluded that consanguineous marriages were positively correlated with GDM as diabetes is a genetic disease so it is highly influenced. Qualified women had more chances to save themselves from GDM as compare to Non-qualified women concluding that awareness and qualification play an important role to save a person from diabetes.

Recommendations: Based on Study Results the following recommendations are formulated which include, Awareness programs should be conducted about DM and GDM. Mothers with familial vertical history of DM and GDM must take preventive measures before conception. Additional facilities should be provided to women with DM and GDM prenatal complications to reduce worse pregnancy outcomes.

Future Prospects: Additional information from future studies will benefit us to establish a better degree of accuracy about GDM. Some of these are further studies are needed to examine the genes responsible for causing GDM. Future research is needed on the influence of social factors on physiology and pregnancy outcomes. Personalized medicine should be available for all women. Evidence of specific screening and treatment strategies, able to reduce complications during pregnancy. Important research topics must include studies of offspring of women with a history of GDM.

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