Prevalence of Gestational Diabetes Mellitus in Nyala City, South Darfur-Sudan

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Abstract:

Background: Gestational diabetes mellitus (GDM) is defined as a glucose intolerance during pregnancy where the blood glucose level remains below the diagnostic values of diabetes mellitus. The differences in the prevalence of GDM reported in these studies are as much due to ethnic and racial characteristics as it is to the screening protocols and diagnostic criteria used

Objective: Assess the prevalence of gestational diabetes mellitus in Nyala City. South Darfur-Sudan.

Methodology: This study is a descriptive hospital-based study carried out in Nyala City, South Darfur, Sudan during the period from May 2014 to November 2014). The sample size was 200 Sudanese pregnant women aged between 15 - 40 years, and gestational age between 20 - 40 weeks which measured by ultrasound or last ministerial cycle. Blood glucose was measured using- spectrophotometer (Biosystem) and American Diabetic Association criteria for gestational diabetes mellitus diagnosis were used.

Result: A total of 200 Sudanese pregnant women first were screened by 50g oral glucose load (30) pregnant women are positive or 15% in, screening (glucose chilling test), then positive screening underwent diagnostic test by oral 75g glucose load, positive diagnostic test have gestational diabetes mellitus was 4.5% (a pregnant women).

Conclusion: This study concluded that, the prevalence of gestational diabetes mellitus in Nyala City-South Darfur, Sudan is 4.5%.

Key word: Gestational diabetes mellitus, Sudanese, pregnant, Darfur.

I. Introduction

Gestational diabetes mellitus is defined as any degree of glucose intolerance onsets or first recognition during pregnancy [1]. Women with gestational diabetes mellitus have an increased risk of developing type 2 diabetes in their life[2], Causes of gestational diabetes mellitus during pregnant the placenta produces high level of various hormones impaired the action of insulin (insulin resistance) which lead to develops during the last half pregnancy, sometimes as early as the 20th weak[3]. Recent studies on gestational diabetes mellitus prevalence have reported region al variation [4] and association with the socioeconomic characteristic of women[5]. The rate of gestational diabetes mellitus range from 2 to > 10% and sometimes much higher, is depending on the population being tested and the diagnostic criteria being used [6]. Most women are treated with lifestyle modification [7], Physical activity, the effect of exercise during pregnancy for preventing pregnancy glucose tolerance [8]. Insulin is the gold standard for treatment of high glucose level during pregnancy when lifestyle measures do not maintain glycogenic control [9]. There are many types of diagnostic criteria for gestational diabetes mellitus but they are two criteria are used in the most world WHO criteria (one or more abnormal) oral 75g glucose tolerance test then measured fasting, one hour, two hours[10]. And American Diabetes Association 50g oral glucose for screening then 75goral glucose for diagnosing test [11].

II. Materials and methods

Study population: this study was descriptive hospital-based study. This study was conducted in Nayla City, South Darfur-Sudan, conducted on 200 pregnant Sudanese women using selection criteria, pregnant women of 20 to 40 weeks of gestation without diabetes with age range (15 to 40) years were included, exclusion criteria; any pregnant women below 20 weeks, below 15 years-old and have diabetic. **Blood samples and data collection**: 3.0 ml of blood sample were taken from pregnant women in fluoride container, then centrifugation

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for 5 minutes at (300rpm) and then glucose was measured in the clear plasma immediately by using spectrophotometer (Biosystems) and same glucose reagent (Biosystems) use glucose oxidase method. For screening test of gestational diabetes mellitus from 200 Sudanese pregnant women were given 50g anhydrous glucose load regardless of previous meal ingestion and then blood glucose was measured after one hour. This to detect positive (≥140 mg/dl) and negative screening for gestational diabetes mellitus. The positive women at the screening test, they went to the confirmatory test. A 75g anhydrous glucose load is administered after (10 -12) hours fast and blood obtained serially fasting, I hour, 2 hours blood samples.

Statistical analysis: was done by using SPSS program used data from 200 pregnant women, mean and standard deviation, percent was calculated using the software.

Result

From the included individuals, 19.5% were positive (15% screening, 4.5% gestational diabetes' mellitus) according the age 1% screening, 0% gestational diabetes mellitus range class (1-5 - 20) years, 1% screening 0% gestational diabetes mellitus range class (20 - 25) years, 2% screening, 1% gestational diabetes mellitus range class (25 - 30) years, 4% screening, 1.3% gestational diabetes mellitus range class (30 - 35) years, 7% screening, 2.2% gestational diabetes mellitus range class (35 - 40) years, this study indicate that the study sample predominating positive test is an older age (30 - 40) years.

According to the week's positive test were 17% weeks duration (31 - 40) weeks and 2.5% positive test in weeks duration (20 - 30) that indicate the prevalence of gestational diabetes mellitus is high last weeks and older age.

Table (1): Describes the screening Test

Test result	Frequency	Percentage
+ve	30	15%
-ve	170	85%
Total	**200**	**100%**

Table(1) shows the result of the screening test, (30) individuals out of (200) show a positive result of the Screening Test, this represents only 15% of the study sample. While the rest of the sample (170) individuals of 85% show a negative result. See **Figure(1)**.
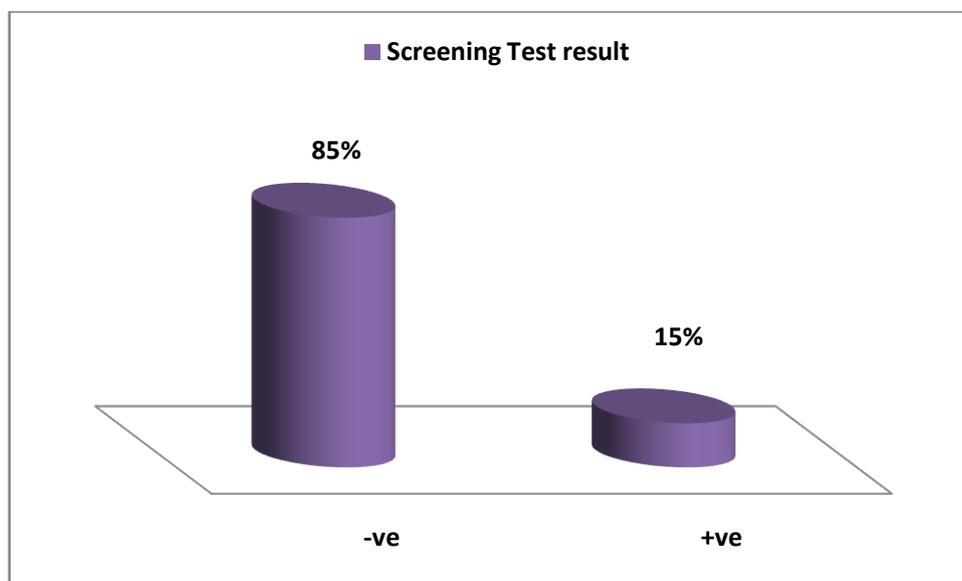

Figure (1) describes the study sample due to the Screening Test

Table (2): Describes the Diagnosing Test

Test Result	Frequency	Percentage
+ve	9	4.5%
-ve	191	95.5%
Total	**200**	**100%**

Table(2) shows the result of Diagnosing test, (9) individuals out of (200) show a positive result of Diagnosing Test, this represents only 4.5% of the study sample. While the rest of the sample (191) individuals of 95.5% show a negative result. See **Figure(2)**.
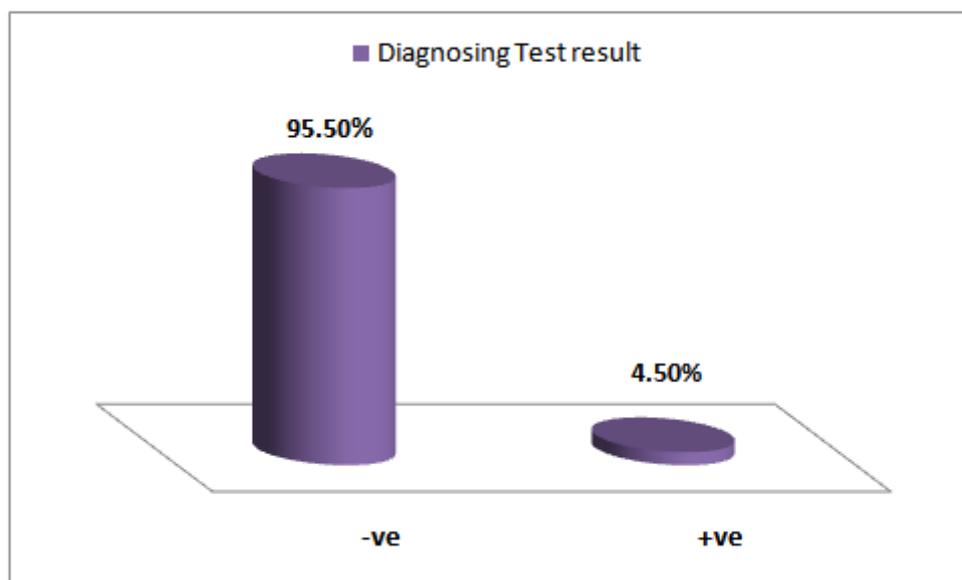
Figure (2) describes the study sample due to the Diagnosing Test

III. Discussion

Our data suggest that the prevalence of gestational diabetes mellitus in Nyala City. South Darfur, Sudan is 4.5% and positive screening test was 15% women they had high blood glucose during screening are done in gestational diabetes mellitus diagnosis is based on two-step at least abnormal, only women who have positive on both test would be diagnosed with gestational diabetes mellitus. Some women who had a positive result on the first test but not the second may respond that had high blood glucose in this pregnancy to diet modification is enough to control glucose level.

In the other study the prevalence of gestational diabetes mellitus in the following countries was (India, Tamil) 17.8·/o, semi-urban 13.8% rural 9.9%, Coba 4.8%, Sudan 2.3% criteria used random blood glucose above 120mg/dl, Cameroon WHO criteria 5% and IADPSG criteria 17%.[12]

From this study compare with our study prevalence of gestational diabetes mellitus in Nyala City was 4.5% is high when compared to the prevalence of gestational diabetes mellitus in Sudan 2.3% but they're different in criteria I used American Diabetes Association (A D A) criteria and. other used random blood glucose more than 120 mg/dl, but our result when compare to Coba 4.8% used WHO criteria there is small different from them 0.3%, when compared with other countries our result is in low level found large variation in estimate gestational diabetes mellitus s, but direct compare between countries is difficult due to different diagnosing strategies and subpopulations, many countries do not perform systematic screening for gestational diabetes mellitus, and practices often diverge from guidelines. Countries need to carefully assess the cost and health impact of scaling up gestational diabetes mellitus screening and management in order to identify the best policy option for their population.

In the end prevalence of gestational diabetes mellitus in Nyala City compare with Sudan is high due to differences in criteria used but with other country is low, the percentage pregnant women screening test rages from 10% to90% when compare our result 15% with this ranges are acceptable.

IV. Conclusion

This study increases good knowledge and awareness about the prevalence of gestational diabetes mellitus in Nyala City. South Darfur, Sudan and lead to the understanding importance of measuring blood glucose level, during pregnancy due to the high prevalence of impaired glucose tolerance test was 15% and prevalence of gestational diabetes mellitus was 4.5 % from 200 pregnant Sudanese women.

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