

## A comparative study of prevalence of Gestational Diabetes Mellitus between urban and rural women in kut city

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### دراسة مقارنة لانتشار داء السكري الحملي بين نساء المدينة والريف في مدينة الكوت

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#### الخلاصة :

الدراسة أجريت لبيان نسبة انتشار داء السكر الحملي بين النساء الحوامل في المدينة والريف في مدينة الكوت -العراق وشملت الدراسة مجموعتان المجموعة الأولى تتكون من 500 امرأة حامل تسكن في داخل المدينة ويراجعن احد مراكز الرعاية الصحية الأولية داخل المدينة والمجموعة الثانية تتكون من 500 امرأة حامل تسكن في المناطق الريفية ويعملن في الحقول الزراعية ويراجعن احد مراكز الرعاية الصحية الأولية خارج المدينة . للمجموعتان من النساء تم التحري عن الإصابة بداء السكر الحملي عن طريق تناول محلول 50 غم من سكر الكلوكوز وقياس مستوى السكر بعد مرور ساعة وثلاث ساعات بعد تناول 100غم للنتائج الغير طبيعية في المرة الأولى. أظهرت نتائج الدراسة بان نسبة انتشار السكر الحملي في نساء المدينة (3,8%) أعلى مما هو عليه في نساء الريف (2,6%)

#### Abstract

This study was carried out to show the prevalence of gestational diabetes mellitus(GDM) between urban and rural pregnant women in kut city of Iraq .A total of one thousand pregnant women (divided into 500 from urban areas and 500 rural areas),who had attended various antenatal clinics were screened for GDM by (one hour post 50 gm glucose load) oral glucose challenge test. Women who had an abnormal screening test proceeded to oral glucose tolerance testing by had a 3 hr. 100 gram oral glucose tolerance test (OGTT) and National diabetes data group criteria applied for diagnosis of GDM. This study showed the overall prevalence of GDM to be 3.2% (3.8% in urban women versus 2.6% in suburban women)

## Introduction

Gestational Diabetes Mellitus is the most common metabolic disorder affecting glucose homeostasis[1].It appears at  $\geq 20$  weeks gestation and disappears immediately or up to 6 weeks after delivery [2]. The definition of GDM, which has been described as carbohydrate intolerance of varying degree of severity with onset or first recognition during pregnancy[3,4]. GDM affects  $\sim 7\%$  of all pregnancies, resulting in  $> 200,000$  cases per year [5] .

Depending on the population sample and diagnostic criteria, the prevalence may range from 1 to 14% of all pregnancies complicated by diabetes, GDM accounts for  $\sim 90\%$ [5,6] .

Recent data shows that gestational diabetes mellitus (GDM) prevalence has increased by  $\sim 10\text{--}100\%$  in several race/ethnicity groups during the past 20 years GDM has been found to be more common in women living in urban areas than in women living in rural areas [2]. The trend toward older maternal age [7], the epidemic of obesity [8] , diabetes [9] , the decrease in physical activity [10] and the adoption of modern lifestyles in developed countries [11] may all contribute to an increase in the prevalence of GDM. Moreover, GDM is associated with several perinatal complications, also because women with GDM and their offspring are at increased risk of developing diabetes later in life [12],

Material and Methods:-

A total of 1000 pregnant women(divided into 500 from urban areas and 500 from rural areas working in agriculture )who had attended antenatal clinic in urban and rural areas in kut city of Iraq, were tested between 24 -36 weeks of gestation. All these women were counseled and booked before enrolling them into the study. Explanation were given about the risk of GDM and the importance of its detection and treatment. After taking patient's consent, they were given 50gm oral glucose load, dissolved in 250ml of tap water. A sample of blood drawn one hour after glucose ingestion was sent to the laboratory for blood glucose estimation by glucose oxidase hexokinase method. A blood glucose level of 130mg/dl was taken as cut off value for further evaluation of the patient by 100gm oral glucose tolerance test (OGTT) and confirmation of the diagnoses of GDM or impaired glucose tolerance IGT, before the OGTT, patients were advised to have rich carbohydrate diet for at least three days and present at the morning of the test with an overnight 12 hours fast. Patients who had two or more abnormal glucose values equal to or exceeding the defined national diabetes data group criteria were labeled to have gestational diabetes and those with only one abnormal value impaired glucose tolerance. Patients

who were screen positive before 28 weeks but OGTT negative or screen negative but had historic high risk factors for GDM were re-screened at 28 weeks. The re-screened positive were subjected to repeat OGTT and those with positive results were reclassified to have GDM or IGT according to the National diabetes data group criteria, while the rest were declared normal and followed in low risk antenatal clinic. Those diagnosed to have GDM or IGT were followed in high risk clinic for maternal blood glucose control in normal range of 80 – 120 mg/dl by diet alone, diet and exercise or insulin therapy and for strict fetal monitoring throughout the pregnancy.

## RESULTS

Among the 500 urban pregnancies women, the study identified 401 (80.2%) women with normal glucose tolerance and 80 (16%) with impaired glucose tolerance, including 19 (3.8%) with GDM. Compared with women who had normal glucose tolerance, women with GDM or abnormal glucose tolerance were more likely to be older (Table 1).

**Table-1 prevalent of G.D.M. between urban pregnant women**

<b>age</b>	<b>Number of women participate</b>	<b>%</b>	<b>Normal G.T.T</b>	<b>%</b>	<b>Impaired G.T.T</b>	<b>%</b>	<b>G.D.M</b>	<b>%</b>
<b>14 – 24</b>	<b>52</b>	<b>10.4</b>	<b>43</b>	<b>8.6</b>	<b>8</b>	<b>1.6</b>	<b>1</b>	<b>0.2</b>
<b>25 - 34</b>	<b>310</b>	<b>62</b>	<b>260</b>	<b>52</b>	<b>45</b>	<b>9</b>	<b>10</b>	<b>2.0</b>
<b>35 - 39</b>	<b>118</b>	<b>23.6</b>	<b>90</b>	<b>18</b>	<b>23</b>	<b>4.6</b>	<b>5</b>	<b>1.0</b>
<b>40 - 45</b>	<b>15</b>	<b>3</b>	<b>8</b>	<b>1.6</b>	<b>4</b>	<b>0.8</b>	<b>3</b>	<b>0.6</b>
<b>total</b>	<b>500</b>	<b>100</b>	<b>401</b>	<b>80.2</b>	<b>80</b>	<b>16</b>	<b>19</b>	<b>3.8</b>

Among the 500 rural pregnancies women, the study identified 436 (87.2%) women with normal glucose tolerance and 51 (10.2%) with impaired glucose tolerance, including 13 (2.6%) with GDM. Compared with women who had normal glucose tolerance, women with GDM or abnormal glucose tolerance were more likely to be older (Table 2).

**Table-2 prevalent of G.D.M. between rural pregnant women**

<b>age</b>	<b>Number of women participate</b>	<b>%</b>	<b>Normal G.T.T</b>	<b>%</b>	<b>Impaired G.T.T</b>	<b>%</b>	<b>G.D.M</b>	<b>%</b>
<b>14 – 24</b>	<b>138</b>	<b>27.6</b>	<b>125</b>	<b>25</b>	<b>10</b>	<b>2</b>	<b>2</b>	<b>0.4</b>
<b>25 - 34</b>	<b>223</b>	<b>44.6</b>	<b>191</b>	<b>38.2</b>	<b>25</b>	<b>5</b>	<b>6</b>	<b>1.2</b>
<b>35 - 39</b>	<b>129</b>	<b>25.8</b>	<b>113</b>	<b>22.6</b>	<b>12</b>	<b>2.4</b>	<b>4</b>	<b>0.8</b>
<b>40 - 45</b>	<b>10</b>	<b>2</b>	<b>7</b>	<b>1.4</b>	<b>4</b>	<b>0.8</b>	<b>1</b>	<b>0.2</b>
<b>total</b>	<b>500</b>	<b>100</b>	<b>436</b>	<b>87.2</b>	<b>51</b>	<b>10.2</b>	<b>13</b>	<b>2.6</b>

## Discussion

This study found that pregnant women living in rural area and work in agriculture exposed to moderate to vigorous physical exercise during pregnancy will have reduced risk of developing gestational diabetes mellitus and abnormal glucose tolerance. This could be attributed to that physical exercise increases insulin sensitivity of muscle glucose transport and also enhances insulin action in extra muscular tissues. It has been found that the three most important endocrine responses to exercise include:-

1. a decrease in plasma insulin .
2. an increase in sympathetic nervous activity causing changes in insulin counter-regulatory hormones.
3. hormones affecting sodium and water balance[13] .

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