Study on Physical Activity as a Determinant of Gestational Diabetes Mellitus in Antenatal Women attending a Tertiary Care Hospital

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ABSTRACT

Gestational diabetes mellitus (GDM), defined as glucose intolerance with first recognition in pregnancy, has become a growing health concern. Gestational diabetes mellitus has been related to significant short-term and long-term adverse health outcomes for both mothers and offspring. Physical activity in all stages of life has a great role in maintaining cardiorespiratory fitness. Regular physical activity during pregnancy improves and maintains physical fitness.

In this study, 301 antenatal women aged between 19 and 45 years attending the outpatient department (OPD) of Obstetrics and Gynaecology were studied for the association of physical activity and GDM. No significant association was observed between age and GDM (p = 0.0968) and between physical activity and GDM (p = 0.5880). Therefore, the present study recommends antenatal women to perform physical activity for recommended duration with all precautions and also do the activity that has minimal risk, such as brisk walk and balanced aerobic exercises.

Keywords: Antenatal, Gestational diabetes mellitus, Physical activity, Tertiary care hospital.


Source of support: Nil

Conflict of interest: None

INTRODUCTION

Physical activity is defined as any bodily movement produced by contraction of skeletal muscle. Physical activity in all stages of life has a great role in maintaining cardiorespiratory fitness, which reduces the risk of obesity and comorbidities, such as diabetes, hypertension, and cardiovascular diseases associated with it. Regular physical activity during pregnancy improves and maintains physical fitness, helps in weight management, reduces the risk of gestational diabetes in obese women, and enhances psychological well-being. Gestational diabetes mellitus (GDM), defined as glucose intolerance with first recognition in pregnancy, has become a growing health concern. Gestational diabetes mellitus has been related to significant short-term and long-term adverse health outcomes for both mothers and offspring. The prevalence of GDM increases with age. Diabetes has become a major public health challenge globally. This disease affects 8.3% (366 million people) of the world population in the 20 to 79 years age group.

Physical activity during pregnancy has minimal risk and has been shown to benefit most of the antenatal women. For healthy pregnant and postpartum women, the US Department of Health and Human Services has recommended at least 150 minutes per week of moderate-intensity aerobic activities, equivalent to brisk walking. Physical inactivity is the fourth leading risk factor for early mortality worldwide.

AIMS AND OBJECTIVES

The aim of this article is to find the association between physical activity and age with GDM in antenatal women attending a tertiary care hospital of Bareilly district, Uttar Pradesh, India.

MATERIALS AND METHODS

The study was conducted in a tertiary care hospital of Bareilly district, Uttar Pradesh, India, in the outpatient department (OPD) for the duration of 1 year. Antenatal women attending the OPD were included in the study. Informed consent was taken from the study participants. The women who did not give consent or those who were seriously ill were excluded from the study. Total women included in the study were 360 and out of them, only 301 participated completely. The questionnaire was prepared and responses were recorded subsequently. Data were entered and analyzed to find the association between physical activity and GDM with the help of chi-square and t tests. Data were analyzed using Statistical Package for the Social Sciences version 22.0.
RESULTS

The study was conducted in a tertiary care hospital, Bareilly, in the OPD. Among 360 antenatal women attending OPD for the period of 1 year, only 301 participated in the study.

The data were analyzed and it was observed that the majority of study participants, that is, 90.4%, belonged to age group 20 to 30 years followed by 8.6 and 1% participants in the age group of >30 years and <19 years respectively (Graph 1).

In this study, there was no significant association found between age distribution and GDM (Table 1).

Note: Chi-square value = 4.671, p-value = 0.0968 (association was not found statistically significant as the “p-value” was more than 0.05).

The mean duration of physical activity among antenatal women having GDM was 258.8 ± 63.79 minutes and in non-GDM women was 251.9 ± 60.66 minutes. On applying chi-square test and t test no significant association was found between physical activity and GDM (p = 0.5880) (Table 2).

DISCUSSION

In the present study, majority of study participants (90.4%) belonged to age group 20 to 30 years followed by 8.6 and 1% participants in the age group of >30 years and <19 years respectively. There was no significant association between age and GDM, and this observation was dissimilar to the study of Seshiah et al.36 that predicted that the prevalence of GDM increased with age, that is 14.5% in the age group of 15 to 19 years, and 25% (95% confidence interval = 14.4–38.4) in the age group ≥30 years. Swami et al.37 also reported maternal age as an important risk factor for GDM. Seshiah et al.8 reported the significantly higher prevalence of GDM in ages 25 years and above.

This study was conducted to find out the role of physical activity and development of GDM in antenatal women attending a tertiary care hospital, and the result was not found statistically significant as none of the study participants had done the recommended duration of 30 minutes moderate to intense physical activity, such as brisk walk, jogging, aerobics.9 Dissimilar findings have been reported by other studies. A cross-sectional survey conducted in urban India by Bhasin et al.10 in the year 2001 reported that the higher levels of physical activity had a protective association against the development of GDM. Also, studies by Dempsey et al.11,12 in the year 2004 published in different journals had also concluded dissimilar findings, e.g., recreational physical activity alone has been found to have a beneficial association with GDM. In a study, it was also concluded that the 30 minutes moderate to intense physical activity, such as brisk walk, jogging, aerobics, has a high risk of falling and/or chances for abdominal trauma and such types of activities should be avoided during pregnancy.13

CONCLUSION AND RECOMMENDATIONS

In this study, as there was no association between age and GDM, increasing age is not a risk factor for the development of GDM, whereas in other studies age is a significant risk factor for the development of GDM. This concludes that GDM can develop in any age depending upon other risk factors, such as family history, physical inactivity, high-calorie diet. Therefore, more such types of studies are required in this region. There was no significant association between physical activity and GDM as none of the participants performed recommended 30 minutes of moderate to severe physical activities, such as brisk walk, jogging, and aerobics, although it was not a protective measure against the development of GDM. But, on the contrary, it was protective from miscarriage and abdominal trauma. This was the main reason for our subjects not doing the physical activities for the

Table 1: Association of age with GDM (n = 301)

<table>
<thead>
<tr>
<th>Age group in years</th>
<th>GDM</th>
<th>Non-GDM</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>0 (0%)</td>
<td>3 (100%)</td>
<td>3 (100%)</td>
</tr>
<tr>
<td>20–30</td>
<td>20 (7.4%)</td>
<td>252 (92.6%)</td>
<td>272 (100%)</td>
</tr>
<tr>
<td>&gt;30</td>
<td>5 (19.2%)</td>
<td>21 (80.8%)</td>
<td>26 (100%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25 (8.31%)</strong></td>
<td><strong>276 (91.69%)</strong></td>
<td><strong>301 (100%)</strong></td>
</tr>
</tbody>
</table>

Table 2: Association of physical activity with GDM

<table>
<thead>
<tr>
<th>Status of participants</th>
<th>Mean ± SD (duration of physical activity)</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDM</td>
<td>258.8 ± 63.79</td>
<td>0.542</td>
<td>0.5880 NS</td>
</tr>
<tr>
<td>Non-GDM</td>
<td>251.9 ± 60.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NS: Nonsignificant</td>
<td></td>
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</table>
recommended duration. Therefore, the present study recommends antenatal women to perform physical activity for recommended duration with all precautions and also do those activities that have minimal risk, which include brisk walk, jogging, aerobics.

REFERENCES