Age-associated weight gain as potential risk of hyperglycemic indications in randomised middle-aged and geriatric population of Darbhanga, Bihar, India

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Received : 11.01.2022; Accepted : 08.03.2022

ABSTRACT

The present study was undertaken with a view to investigate suitability of age-associated weight gain as potential risk of hyperglycemic indications in randomised middle-aged and geriatric population of Darbhanga, Bihar. Quantitative estimations of Fasting and 2 hours Post-Prandial Blood Glucose concentrations in both the sexes of urbanite human subjects (n=460) residing in Darbhanga, a commissioner town of Bihar, India and consented for required clinical tests were carried out. The study population was categorised into two age intervals of 45-59 and 60-75 years and two BMI-linked obesity groups comprised of Normal Weight and Overweight/Obese individuals. Results showed a trend of marked elevation in observed mean values of chosen blood parameters in subjects from Over weight/Obese groups as compared to those from Normal Weight groups in both the age intervals and appeared suggestive of occurrence of hyperglycemic alterations with accompanying glucose intolerance.

Findings seemingly affirm age-associated weight gain as potential risk of hyperglycemic perturbations in randomised middle-aged and geriatric population of urban Darbhanga.

KEY WORDS : Age, Ageing, Geriatric, Glucose, Homeostatic, Hyperglycemic, Obesity

Introduction

Gerontologists world over are of the consensus opinion that ageing has a vibrant beginning in the form of maturational growth, development and ending up in irrevocable functional disabilities and death. Ageing is believed to turn degenerative in later part of life, in all probabilities, as a natural fall out of inescapable senescence. Late age dysfunctions and disabilities are thought to induce variable age-associated diseases and very often prepone death. Ageing is not perceived as a disease, yet it is considered to cause loss of structure and functions with advancing age and triggers onset of metabolic discrepancies in highly vulnerable older adults.

Available literature regard late onset type 2 diabetes a serious public health menace with higher incidence in urban population and glucose intolerance in human subjects under 40 years of age and strikingly enough, more than a quarter of patients with diabetes remaining undiagnosed. Overweight and obese subjects are reportedly at raised morbidity and mortality risks of cardiovascular and cardio-metabolic disorders including diabetes, obesity, and adverse risk factor profiles of cardiovascular diseases has also been elucidated.

Late onset or type 2 diabetes is believably a chronic health concern with serious impact on daily life activities of the patients. A trend of rise in its incidence with devastating pathophysiologic implications in the ageing population of India has led to extensive diabetes-oriented explorations for finding out more effective ways and means of disease management. Possible impact of age-mediated weight gain on glucose homeostasis and its repercussions on population health is widely debated now a days and demands experimental confirmation.

Quite pertinently, reported relative risks of deaths from coronary heart disease(CHD) associated with diabetes, segregation of diabetic adults with high triglyceride and low HDL-C at increased risk of CHD and stroke and acceptability of impaired fasting glucose(IFT) and impaired glucose tolerance (IGT) as equally potent cardiovascular risks could be thought possible indication of a nexus between hyperglycemia and dyslipidemia, inevitable physiological derangements in late age.

Keeping in view rapid increase in the prevalence of diabetes mellitus and cardiac problems in overweight Indians and distinct correlation between BMI and the
### Table-1 : Mean Blood Glucose Fasting (mg/dl) of Urbanite Study Population (n=460) in respective Age, Gender and Obesity Groups

<table>
<thead>
<tr>
<th>Age(yrs.)</th>
<th>Gender</th>
<th>Obesity Group</th>
<th>Blood Glucose Fasting ± SEM(mg/dl)</th>
<th>%CV</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-59</td>
<td>M</td>
<td>NW</td>
<td>139.7 ± 16.32</td>
<td>35.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OW/OB</td>
<td>119.86 ± 3.587</td>
<td>36.401</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>NW</td>
<td>126.2 ± 3.98</td>
<td>6.307</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OW/OB</td>
<td>125.47 ± 5.871</td>
<td>51.047</td>
</tr>
<tr>
<td>60-75</td>
<td>M</td>
<td>NW</td>
<td>135.88 ± 20.698</td>
<td>40.303</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OW/OB</td>
<td>133.54 ± 5.194</td>
<td>34.133</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>NW</td>
<td>87</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OW/OB</td>
<td>136.95 ± 7.53</td>
<td>44.343</td>
</tr>
</tbody>
</table>

N.B: NW-Normal Weight, OW-Overweight, OB-Obese, M-Men, W-Women

Glucose level\(^1,5\), intensive management of cardiovascular complications among diabetic patients with CVD risk factors\(^20\) has been aptly recommended.

It is in this pursuit that the present study aimed at exploring possibility of age-associated weight gain serving as potential risk of hyperglycemic indications in...
Table-2 : Mean Blood Glucose PP (mg/dl) of Urbanite Study Population (n=460) in respective Age, Gender and Obesity Groups

<table>
<thead>
<tr>
<th>Age(yrs.)</th>
<th>Gender</th>
<th>Obesity Group</th>
<th>Blood Glucose PP ± SEM (mg/dl)</th>
<th>%CV</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-59</td>
<td>M</td>
<td>NW</td>
<td>187 ± 26.36</td>
<td>42.289</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OW/OB</td>
<td>171.68 ± 5.403</td>
<td>40.913</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>NW</td>
<td>167.2 ± 8.564</td>
<td>10.244</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OW/OB</td>
<td>173.15 ± 7.691</td>
<td>48.86</td>
</tr>
<tr>
<td>60-75</td>
<td>M</td>
<td>NW</td>
<td>163.5 ± 27.769</td>
<td>44.936</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OW/OB</td>
<td>194.18 ± 8.773</td>
<td>39.646</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>NW</td>
<td>133</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OW/OB</td>
<td>197.32 ± 11.173</td>
<td>45.653</td>
</tr>
</tbody>
</table>

N.B: NW-Normal Weight, OW-Overweight, OB-Obese, M-Men, W-Women

randomised middle-aged and geriatric population of Darbhanga, Bihar was undertaken.

Materials and Methods
In this study, Fasting and 2 Hours Post-Prandial

Fig. 2 : Mean Blood Glucose PP (mg/dl) of Urbanite Study Population (n=460) in respective Age, Gender and Obesity Groups
Blood Glucose concentrations (mg/dl) in both the sexes of randomised middle-aged and geriatric population (n=460) inhabiting Darbhanga, a commissioner town of Bihar and having consented for clinical tests require were estimated quantitatively using Semi-Automated Analyzer. The study population was categorised into two age groups of 45-59 and 60-75 years and Body Mass Index (BMI)-linked twin obesity groups of Normal Weight and Overweight/Obese subjects. Reference values of chosen blood serum constituents (Fasting Blood Glucose: 70-100 mg/dl and 2 Hours Post Blood Glucose: 100-140 (Normal: <150 mg/dl and pathologic: >150 mg/dl) and of BMI for the Indian population (Normal Weight: 18.00 to 22.90, Overweight: 23.00 to 24.99 and Obese: >25) were followed.

**Results and Discussion**

Observed mean values of Fasting and 2 Hours Post-Prandial Blood Glucose were found to be apparently in the higher range in Normal Weight and Overweight/Obese groups of both the sexes in 45-59 and 60-75 years age interval (Table 1 & 2, Fig. 1 & 2). However, ANOVA did affirm highly significant variation in BMI for men (F=90.484) and in Age (F=37.815) and BMI (F=33.904) for women at 0.0001 level of P. Data might be regarded as an indication of hyperglycemic perturbations with marked impaired glucose tolerance and seemingly in agreement with. More or less, similar observations suggested potential risks of age and obesity for diabetogenicity and dyslipidemia in older adults and, in all probabilities, in tune with the proposition pronouncing post-Prandial hyperglycemia as very strong marker for CVD as compared with Fasting Hyperglycemia. Conclusively, age-associated weight gain might be thought as potential risk of hyperglycemic indications in randomised middle-aged and geriatric population of urban Darbhanga and attributed to erratic feeding habit with high appetite for fast food and sedentary life style with minimal level of physical activity. Active life pattern accompanied with intake of regulated diet is recommended for minimising risks associated with type 2 diabetes.

**References**


