



## Study of Correlation of BMI with Fasting Blood Glucose in Perimenopausal Women

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### Abstract

**Objectives:** To study the correlation of BMI with fasting blood glucose in perimenopausal women.

**Methods:** The study was conducted on 100 subjects. Subjects were divided into 3 subgroups normal, overweight and obese on the basis of BMI. Bodyweight and height was taken. BMI was calculated using Quetelet's index. Blood samples were taken. Data obtained was compiled and statistical analysis was done. All parameters were reported as mean and standard deviation. A  $p$  value  $< 0.05$  was considered statistically significant and vice-versa.

**Conclusion:** A highly significant correlation was seen in obese perimenopausal women whereas positive correlation was seen between fasting blood glucose and BMI in normal and overweight perimenopausal females.

### Introduction

Before the onset of menopause, there starts a period of transition, also called as perimenopause, from the reproductive to non reproductive phase of life. Perimenopause is a critical period of life during which striking endocrinologic, somatic and psychological alterations occur. The perimenopausal period encompasses the change from ovulating cycles to the an ovulating cycles up to the cessation of menses and is marked by irregularity of menstrual bleeding in perimenopausal women<sup>[1]</sup>. The endocrine alterations may result in visceral obesity, insulin resistance, lipid disorders, thrombotic risks<sup>[2]</sup>. This is because during the perimenopause, insulin

sensitivity decreases, especially when there is weight gain<sup>[3,4]</sup> and also through the menopausal transition, the BMI and total body fat percentage were increased significantly<sup>[5]</sup>. As BMI and central obesity pose a risk for diabetes mellitus, assessment of correlation of BMI with blood glucose in perimenopausal women is essential. So, the present study is planned to assess the correlation of BMI with fasting blood glucose in perimenopausal women

### Material and Methods

100 subjects were selected from different outpatient departments of Government Medical College, Jammu. After detailing the purpose and

methodology of the study, all eligible subjects were requested to participate in the study. For BMI, body weight was measured in kgs and height was measured in meter. BMI was calculated by Quetelet's Index<sup>[6]</sup>. Subjects were classified as normal, overweight and obese according to cut-offs recommended by WHO<sup>[7]</sup>. Fasting blood glucose was measured by hexokinase-glucose-6-phosphate dehydrogenase method<sup>[8]</sup>.

## Results

### Correlation of BMI with Fasting Blood Glucose in Perimenopausal Women

BMI (Kg/meter square)	Classification	Perimenopausal (no.)	Mean fasting glucose(mg/dl)	Pearson correlation with p-value
18.50-24.99	Normal weight	54	88.29±9.87	0.038 P=0.787
25.00-29.99	overweight	27	93±19.36	0.378 P=0.052
>30.00	Obese	19	112±14.16	0.885 P=0.00

Table shows the mean fasting blood glucose in normal weight females is 88.29(SD±9.87)mg/dl. Overweight females have mean fasting glucose levels of 93(SD±19.36) mg/dl. Obese females have mean fasting glucose levels of 112.26

### Statistical Analysis

All parameters were reported as mean and standard deviation. The statistical differences in mean values were tested using Levene's test for equality of variances followed by t-test for equality of means. ANOVA was used to do comparison within the subgroups. Pearson correlation was used to calculate the correlation between various variables.

(SD±14.16) mg/dl. It also shows pearson correlation values and p-values. There is a positive correlation in all three subgroups but p-value is highly significant in obese subgroup.

### Comparison of Fasting Blood Glucose and BMI in Perimenopausal Women

Parameter	Normal	Overweight	Obese	F value	P value
	Mean±SD	Mean±SD	Mean±SD		
FBG	88.29±9.87	93±19.36	112±14.16	21.353	0.000

Table shows perimenopausal women show significant difference of fasting blood glucose in all three subgroups, p-value is highly significant. As the BMI increases, blood sugar increases.

## Discussion

Findings of this study were consistent with the study conducted by that diabetes mellitus is strongly correlated to many metabolic and clinical abnormalities including dyslipidemia, obesity, insulin resistance and hyperinsulinemia<sup>[9]</sup>. Fasting blood sugar levels were positively and significantly correlated with total body weight and BMI<sup>[10]</sup>. BMI was greater for women in the perimenopausal period<sup>[11]</sup> or for women who had just undergone menopause<sup>[12]</sup>. Risk of diabetes

mellitus increased with increase in BMI<sup>[13]</sup>. A larger percentage of type 2 diabetics have central obesity as compared to general obesity and both types of obesity was greater in females<sup>[14]</sup>. Also, in women, the prevalence of abnormal glucose metabolism is known to increase around and after 50 years of age<sup>[15]</sup>.

## Conclusion

The present study was conducted to assess correlation of BMI with fasting blood glucose in perimenopausal females. The findings of study indicate that positive correlation was seen between fasting blood glucose and BMI in normal and overweight perimenopausal females whereas

significant correlation was seen in obese perimenopausal females. Also, fasting plasma glucose level predicts further risk of diabetes and other associated diseases in perimenopausal women.

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