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Original Research Article

Increasing BMI is a risk factor for developing pre diabetes hyperglycemia and Diabetes

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ABSTRACT

Background: Postmenopausal bleeding is a frequent finding accounting for 5-10% of women in gynaecology. About 10% of these patients have primary or secondary malignancy.
Aim: The histopathological patterns of endometrium, in postmenopausal women presenting with bleeding were studied along with the frequency of endometrial cancer.
Materials and Methods: It was both a prospective and retrospective, observational study carried out over a period of one and half year in tertiary care teaching hospital on 112 postmenopausal women ,above 40 year of age with history of one year of amenorrhoea without hormone replacement therapy. The samples were obtained by dilatation and curettage and endometrial pipelle procedure.
Results and Discussion: Maximum patients belonged to age group of 46-50 year. The most common histopathological pattern observed was atrophic endometrium in 42(37.5%) patients followed by simple hyperplasia in 13(11.6%) and endometrial polyp in 7(6.25%) cases. Irregular shedding of endometrium was diagnosed in 8(7.14%). The maximum patients of endometrial carcinoma (5.35 %) were noted in 61-65 age groups. Inflammatory pathology was found in 4(3.56%) and atypical hyperplasia was seen a single case (0.89%). In 8 cases, the opinion could not be offered due to inadequacy of sample.
Conclusion: As the incidence of malignancy in postmenopausal period remains sufficiently high, it requires immediate investigation in the form of endometrial sampling for early diagnosis, prompt treatment and vigilant follow up.

1. Introduction

Obesity is increasing at an alarming rate throughout the world. Several studies in India have shown that changes in dietary patterns, physical activity level are related to increasing frequencies of obesity. The role of vitamin fortification leading to obesity is becoming more prevalent in recent days.[1] In obesity as excessive adipose tissue accumulates, an altered metabolic profile occurs along with a variety of adaptations and alterations in cardiovascular structure and function even in the absence of co-morbidities. Studies indicate that the presence of obesity increases the risk for developing diabetes and cardiovascular diseases.[2]

Adipose tissue excess or obesity, particularly in the visceral compartment, is associated with insulin resistance, hyperglycemia, dyslipidemia. hypertension, and prothrombotic and proinflammatory states. The most common cause of insulin resistance occurs when energy intake exceeds the metabolic rate leading to obesity.[3]

Type II diabetes mellitus is strongly associated with overweight in both genders in all ethnic groups.[4]

Men and women with a BMI of 25.0 to 29.9 kg/m2 are considered overweight, and those with a BMI 30 kg/m2 or greater are considered obese. The prevalence of obesity - related diseases, such as diabetes, begins to increase at BMI values around 25 kg/m2. Obese persons with excess abdominal fat are at higher risk for diabetes, hypertension, dyslipidemia, and ischemic heart disease than obese persons whose fat is located predominantly in the lower body.[5]

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In obese adults, type 2 diabetes develops over a long period, and impaired glucose tolerance can be a predictor for the risk of development of diabetes and cardiovascular disease.[6]

FBS < 100 mg/dl is considered normal and between 100–125 mg/dl along with Hb A1C 5.7%-6.4% is marked as impaired fasting glucose or prediabetes. FBS≥ 126 mg/dl along with Hb A1C ≥6.5% is defined as diabetes mellitus.[7]

Prediabetic hyperglycemia -fasting plasma glucose of 110 to 125 mg/dl confers an increased risk for cardiovascular disease.[8]

The prevalence of diabetes and prediabetes are known to relate with higher ranger of waist circumference, waist /hip ratio and body mass index.[9]

2. Aims and Objectives

To study the relation between BMI and fasting blood sugar.

3. Materials and Methods

The subjects for the study were 200 in the age group of 21 to 40 years. Control group of 100 patients had BMI of 18-24 kg/m2 and study group of 100 patients had BMI of 25-29kg/m2. Height and weight were recorded.

Study group excluded people on treatment for diabetes mellitus and cardiovascular diseases.

BMI was calculated from the following equation

Body Mass Index (kg/m_2) = Weight in Kg

Height in m2

The Body Mass Index value ranging between 18.5 - 25.0 is considered as normal, < 18.5 indicates the status as undernourished, while value above 25 as overweight and above 30.0 as obese.

3.1. Biochemical analysis

The patient was asked to fast overnight for 8-10 hours. Fasting Blood Sugar was estimated by Glucose Oxidase method.

4. Results

Table 1: Comparison of BMI with fasting blood sugar

BMIkg/m ^{2}	FBS <11O mg/dl	FBS 110-125mg/dl	FBS >126 mg/dl
<25	75	20	5
>25	25	50	25

75% of overweight patients had FBS>110 mg/dl whereas 25% of normal weight patients had FBS>110 mg/dl.

Prediabetic hyperglycemia was noted in 50% of overweight patients.

Diabetes was diagnosed in 25% of overweight patients.

5. Discussion

Diabetes mellitus is one of the leading risk factors of Coronary Artery Disease and is growing in developing countries because of the changes in lifestyles, increasing high-calorie diet and physical inactivity.[10]

All stages of glucose abnormalities like prediabetes and established diabetes mellitus are associated with CAD and detection of these abnormalities is of great value in early screening of cardiovascular diseases.[11,12]

Resistin is an adipokine secreted from adipose tissue and monocytes. It is named for its ability to resist or interfere with insulin action It was proposed as a link between obesity and diabetes.[13,14]

In obese individuals, adipose tissue releases increased amounts of non-esterified fatty acids, glycerol, hormones, pro-inflammatory cytokines and other factors that are involved in the development of insulin resistance.[15]

Our study is done to re-establish the direct relationship between increased body weight and fasting blood sugar.

In the control group of BMI <25, majority of people showed fasting blood sugar of less than 100mg/dl.In the study group with BMI>25, majority of people showed FBS >100mg/dl As we have excluded patients of diabetes mellitus and cardiovascular diseases in our study, other causes for the increased FBS leading to prediabetes, like the role of stress in daily life should be considered. Stress hormones are known to increase blood glucose levels. Physical and emotional stress increases these hormones thereby increasing blood glucose levels.

Measures should be taken by the prediabetics to keep the sugar levels normal from reaching diabetic levels by changing the lifestyle, increasing physical activity, consuming food having low glycemic index with high fiber content and frequent monitoring of blood glucose levels along with HbA1c.

Prediabetic state is a ‘grey zone’ which implies a declining glucose homeostatic efficiency. Though only 25% of cases progress to full blown T2DM, when combined with obesity (BMI >25), it is a definite predictor of onset of T2DM in due course. Moreover, complications particularly cardiovascular abnormalities begin in prediabetic phase surreptitiously even before overt Diabetes is medically diagnosed

6. Conclusion

The existence of a significant direct correlation between FBSand BMI was confirmed in the present study. Our results therefore suggest that a low BMI is important for maintaining normal blood glucose levels.

This study highlights the critical importance of early intervention directed at treatment of obesity in association with normal blood glucose levels to avert the long-term consequences of obesity and diabetes mellitus on the

development of various complications

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8. Conflict of Interest

The authors declare they have no conflict of interest.

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