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Severity of Premenopausal symptoms in Obese and Non-Obese Females

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Abstract

Introduction: Obesity is considered as a important modifier of female hormones**.** Obesity affects the severity of premenopausal symptoms also such as hot flashes, poor sleep, aches, joint pain and urinary symptoms.

Material & Methods: This study was conducted in premenopausal obese and non-obese females to asses serum estrogen, progesterone and FSH levels and to compare severity of premenopausal symptoms in both groups also.

Results : We found that in obese premenopausal females serum Estradiol and progesterone levels were less and serum FSH levels were high as compared with non-obese females and premenopausal symptoms are more severe in obese females.

Conclusion: We conclude that obesity in an important factor in hormone changes occurring during menopausal transition in females. The findings also suggests that in mid-life females, the effects of obesity should be considered when interpreting hormone levels.

Keywords: premenopausal symptoms, obesity, female sex hormones.

INTRODUCTION

Obesity is identified as an important modifier of reproductive hormones. In mid-life women, obesity is associated with menstrual cycle alterations like anovulatory cycles ending with bleeding, different presentation of pre-menopausal symptoms such as hot flashes, poor sleep, aches, joint pain and urinary symptoms. [1-4] Many women experience weight gain, increases in central adiposity and other complex changes in

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the body composition around menopause. The extent of these changes are not clearly identified and are specific to levels or changes in reproductive hormones or to other behavioral and disease factors.[5-6] Body size as measured by body mass index (BMI) is an important mediator of hormone levels in the menopausal transition.[7-8]

Present study plans to disentangle the complex associations among BMI, premenopausal symptoms and other modifiers with hormone levels.

Aim & Objectives:

To estimate the correlation between severity of premenopausal symptoms in obese and non-obese females by calculating BMI and estimation of serum progesterone, estradiol and FSH in obese and non-obese premenopausal females.

MATERIAL & METHODS

This study is a case control study, conducted in the Department of Biochemistry in Era's Lucknow Medical College & Hospital, Lucknow. Total 180 females of premenopausal age group were taken in which 90 were obese and 90 non-obese. BMI and levels of serum progesterone, estradiol and

FSH were tested in obese and non-obese premenopausal females along with enquiry regarding various premenopausal symptoms were done.

Inclusion Criteria

a) All females participants between 35-47 years of age.
b) All participants have a regular menstrual cycle in normal range (22-40 days) for previous three cycles.
c) All participants have no history of any other medical illness which affects hormone levels.
d) All participants were not on any medications which alter hormone levels.

Exclusion Criteria:

Participants on any medication which affects hormone levels.

Females with any medical illness.

Participant should not be pregnant or breast feeding.

Participant should not be associated with diseases which will effect the menstrual cycle.

No history of drug or alcohol abuse in the past year.

RESULT

The mean age of obese females was 39.94+3.22 whereas the mean age of non-obese females was 39.366+4.01 years and all females were pre-menopausal. Serum hormones levels are shown in Table 1. The obese women had significantly lower estradiol levels compared to non-obese

Women. (P=0.04). The obese women also had significantly lower levels of progesterone (P=0.01) and higher FSH levels (P=0.02) when compared to non-obese women.

The mean BMI of obese females was 32.08±1.27 (Kg/m^2) as compared to non-obese females 19.84±4.38 (Kg/m^2) (p=0.4).

The severity of premenopausal symptoms was determined by the help of a preformed questionnaire. All 180 females were asked same questions and there responses was noted down. The severity of symptoms were grouped into two categories of most severe and least severe. The 36.60% of obese females had high severity of symptoms and 63.40% had least severity whereas 23.86 % of non-obese females had high severity and 76.14 % had least to mild severity of pre-menopausal symptoms.

Table 1: Serum hormones levels of obese and non-obese females

PARAMETER	OBESE	NONOBESE	p-VALUE
PROGESTERONE(ng/mL)	**2.6 ±1.2ng**	**12.91±6.57**	**0.01**
ESTROGEN(pg/mL)	**24.39± 9.35**	**59.53 ±23.32**	**0.04**
F.S.H(mIU/mL)	**41.03 ±7.76**	**13.26 ±9.5**	**0.02**
B.M.I (Kg/m^2)	**32.08±1.27**	**19.84±4.38**	**0.4**
SEVERITY OF SYMPTOMS (%)			
Most severe	**36.60**	**23.86**	**0.06**
Least severe	**63.40**	**76.14**	

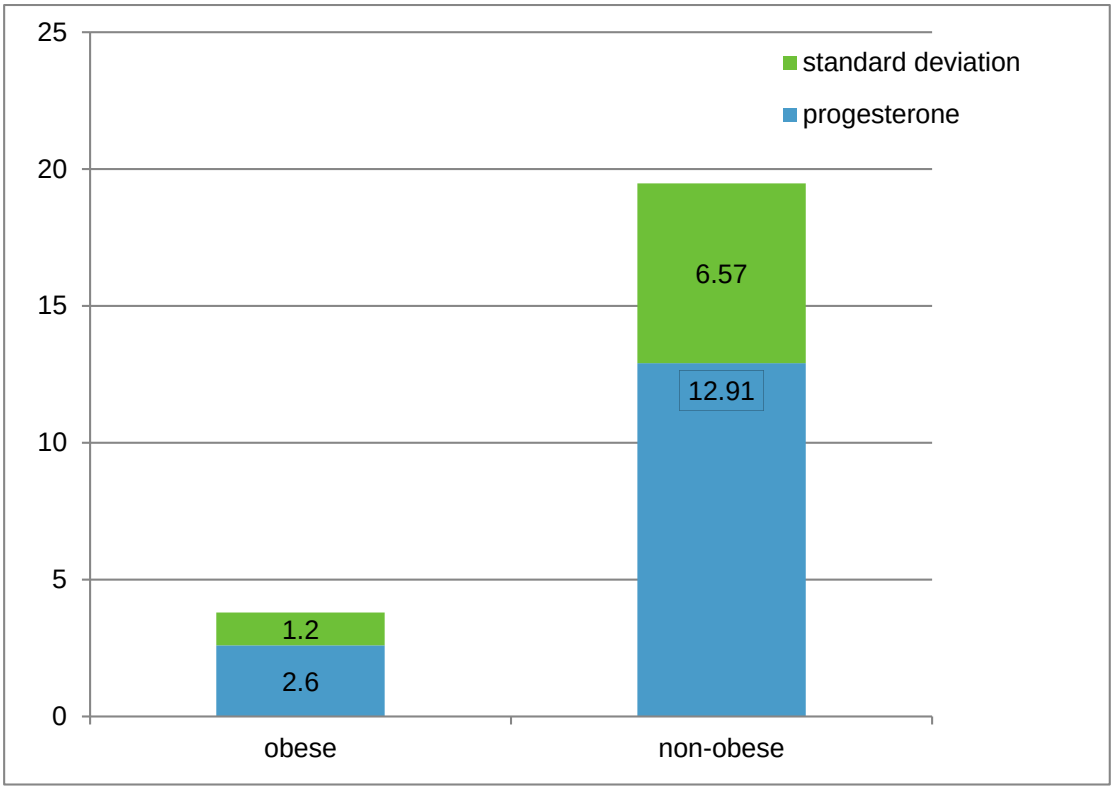

Figure 1: Progesterone levels in obese and non-obese females.

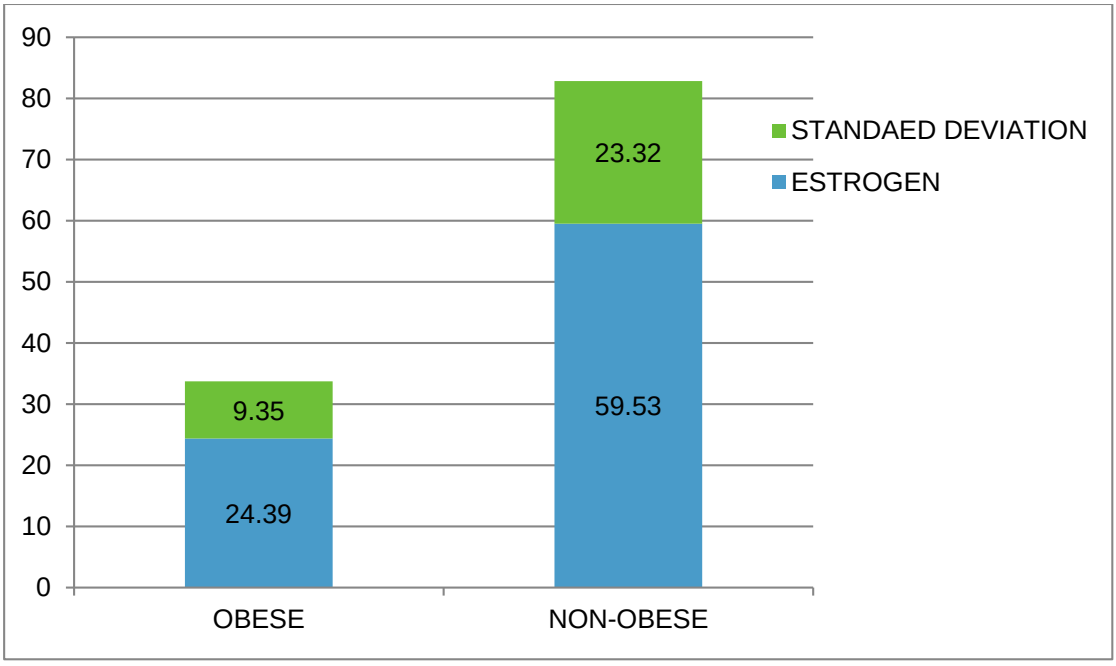

Figure 2: level of estrogen in obese and non- obese females

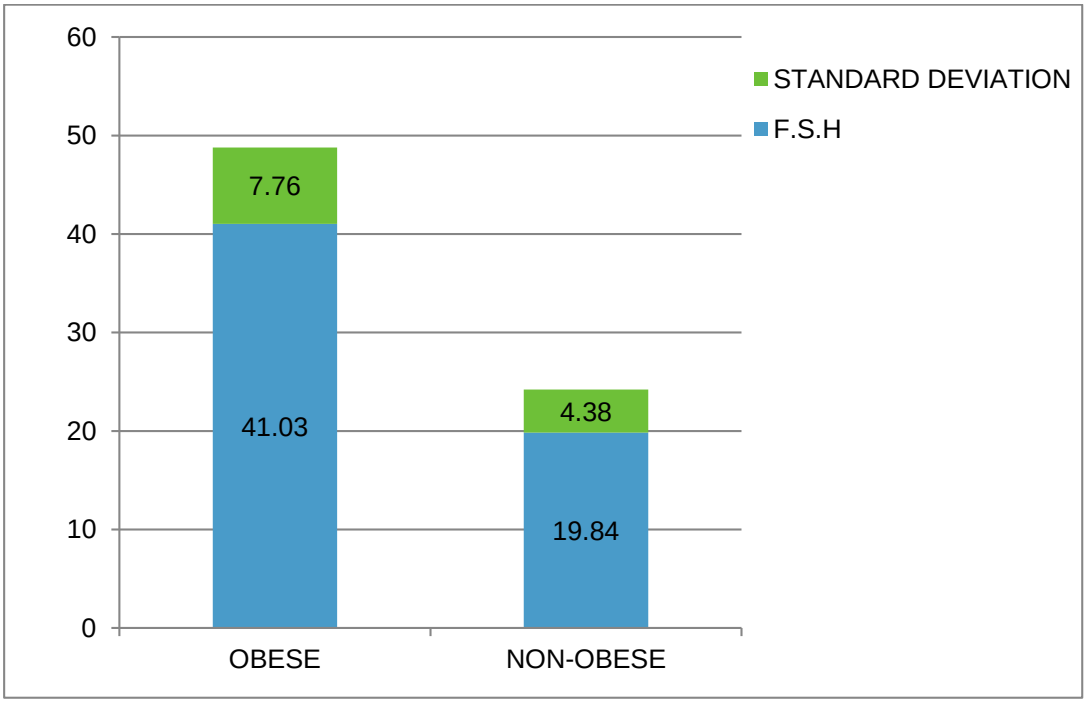

Figure 3: level of F.S.H in obese and non-obese females.

DISCUSSION

The obese women had significantly lower estradiol levels compared to non-obese women (P=0.04) which was also reported by Freeman E W et.al (9). and Randolph JF et.al (10) . The obese women also had significantly lower levels of progesterone (P=0.01) and higher FSH levels (P=0.02) on average when compared to non-obese women. Study by Dalia Edith Meza-Munoz DE et.al[11] stated that at pre-menopause, hormone levels were similar in obese and non obese women, except for serum testosterone and LH, found significantly increased in the obese and non obese groups, respectively .

According to various studies, menopause is associated with the rise in abdominal subcutaneous and visceral fat. The change or increase in visceral adiposity during transition period was due to the decreasing circulating estradiol level and with increasing FSH level , and as per various authors this change was also attributed to the influencing role of estrogen on lipoprotein lipase activity as well as in the lipolysis [12]; Study by Donato GB et al., 2006 reported that there was increase in the waist circumference and waist-hip ratio in women during transition phase, even after controlling for BMI and other confounding factors [8].

While our results also confirms the observations of various previous studies on the negative association between estradiol and BMI in premenopausal women[13,14] but

the mechanisms for this association still remain unclear. It could be said that the low levels of sex hormone-binding globulin (SHBG) seen in obese premenopausal women, which positively correlated with the estradiol levels[15] results in greater clearance of the estradiols and consequently leads to the lowering of oestradiol levels.

As per the both SWAN as well as the Penn Ovarian Aging Study (POAS), obese women had lower estradiol (E2) and follicular stimulating hormone (FSH) levels when compared with the non-obese women [16].

Our study shows that severity of symptoms are more in case of obese females(36.6%) than non-obese females(23.86%).

CONCLUSION

We conclude that obesity in an important factor in hormone changes occurring during menopausal transition in females. Although weight gain among midlife women has been frequently reported, but the interrelationships between obesity and the menopausal transition still remains incompletely understood. The findings also suggests that in mid-life females the effects of obesity should be considered when interpreting hormone levels.

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