



Original Article

Correlation of Menopausal Symptoms with Serum Estradiol in Pre and Postmenopausal Women of Nawabshah (SBA)

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ARTICLE INFO

Key Words:

Menopause, Premenopause, Postmenopause

How to Cite:

Aghani, N., Bhagwani, ., Imtiaz, S., Qadir, G., Memon, M., & Memon, M. . (2023). Correlation of Menopausal Symptoms with Serum Estradiol in Pre and Postmenopausal Women of Nawabshah (SBA): Correlation of Menopausal Symptoms with Serum Estradiol. *Pakistan Journal of Health Sciences*, 4(09). <https://doi.org/10.54393/pjhs.v4i09.1037>

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Received Date: 6th September, 2023Acceptance Date: 27th September, 2023Published Date: 30th September, 2023

ABSTRACT

The term menopause accurately incomes termination of menstrual cycle. A diversity of physiological changes proceeds in the body, certain of these are the consequence of cessation of ovarian function and decreased production of estrogen. **Objective:** To determine the serum estrogen levels and to study menopause related symptoms in pre and postmenopausal women due to declined estrogen levels. **Methods:** This was a cross sectional study. Participants were recruited from the Gynecology and Obstetrics and Medicine OPD/Ward PMCH and from the general public. After explaining the study's goal to all participants, they gave their written and verbal agreement. Blood samples were collected for biochemical testing and stored at -20°C in the laboratory. ANOVA test was applied for comparison of estrogen among the study participants. This study involved 400 individuals who were separated into two groups, Premenopause and Postmenopause. **Results:** The mean \pm SD of age of Premenopausal participants was 44.44 \pm 2.61 years and the mean \pm SD of Postmenopausal females remained 54.78 \pm 2.80 years. The mean value of serum estradiol of pre and postmenopausal participants was noted as 13.03 \pm 11.42 pg/ml 8.21 \pm 4.7 pg/ml. The predominant symptoms among the premenopausal women experienced were depressive mood and irritability (61%) while the symptoms experienced by postmenopausal women were dryness of vagina (59%) and heart discomfort (54%). **Conclusions:** The decrease in estrogen may lead to symptoms like vaginal dryness, mood changes, night sweats and hot flashes. The symptoms experienced are similar as elsewhere in the world, although occurring with varying frequencies.

INTRODUCTION

Menopause is described as the cessation of menstruation caused by the reduction of ovarian follicular activity, which is known to begin around the late 30s and end in the early 50s in the majority of women [1]. Menopause, on the other hand, can cause a slew of unpleasant physical symptoms, including vaginal atrophy, which can lead to vaginitis, pruritus, dyspareunia, and stenosis; genitourinary atrophy, which can lead to urethritis, dysuria, urinary incontinence, and urinary frequency; recurrent urinary tract infections; and vasomotor symptoms like hot flashes and menopausal women must contend with exhaustion, weight gain, and

emotional changes such as anxiety, grief, fear of sickness, hypersensitivity, and irritability, in addition to gynecological health issues caused by decreased estrogen levels [2]. Women can cope with menopause symptoms with typical activities, primarily non-pharmacological measures such as diet, exercise, and herbal remedies that aid with hot flashes. Even though Asian women report rare menopausal symptoms, there are reasons to believe that symptoms related with menopause are consistent regardless of geographic location [3]. As a result, it's possible that cultural factors in Asian countries make

menopausal symptoms less stressful to deal with, or that women suffer in silence. According to various demographic researches, more than half of postmenopausal women over the age of 51 experience mild to severe vaginal dryness, which is linked to particular alterations in menopause hormonal control caused by estrogen deficiency [4]. Furthermore, that approximately 17% premenopause females between the ages of 17 and 50 have difficulty having a sexual intercourse because of vaginal dryness and agonizing sex [5]. Skin irritation, burning, itching, and general unease are common signs of vaginal dryness [6]. Hot flushes should be one of the most prevalent menopausal vasomotor symptoms, with up to 74 percent of premenopause females experiencing them. Hot flashes affect 65 percent of women for more than two years, and 36 percent for more than five years [7].

METHODS

This study was conducted at the Biochemistry Department Peoples University of Medical Health Sciences for Women Nawabshah (PUMHSW) from 1st October 2022 to 10th May 2023 along the cooperation with Gynecology and Obstetrics and Medicine OPD/Ward PMCH. Design of the study was Cross Sectional comparative study. The sample technique was non probability convenience random sample selection. The analysis of sample had been done at diagnostic and research laboratory PUMHSW, Shaheed Benazirabad (SBA). Pre and postmenopausal females between ages among 40 years to 60 years were included. All the females below 40 years and above age 60 years were excluded as well as females with existing endocrinal disorders, renal disorder, liver disorder, cardiac disease, hysterectomy and oophorectomy were also excluded. Sample size had been designed by means of the Rao software with prevalence of 15.74% premenopausal women and 59.06% postmenopausal women by means of the percentage in 95% of confidential intervals then 5% of margins of errors. Subjects were recruited according to the criteria of designed proforma from Department of Obstetrics and Gynecology and Medicine OPDs PMCH Nawabshah. For this study, we collected all clinical data and pertinent information from each participant by filling out a proforma. All participants gave verbal and written agreement after being informed about the study's purpose. The analysis of serum estrogen was done among all three groups. While symptoms of menopause were verbally asked from the Premenopausal and Postmenopausal participants and filled in the designed proforma. The symptoms of menopause were graded according to the severity. Group A: Comprises of 200 premenopausal women between age group of 36 years to 50 years. Group B: Comprises of 200 postmenopausal women between age

group of 50 years to 60 years. Venipuncture of the participants was used to take 5 mL of blood from each participant under aseptic conditions. For the Estrogen 3 mL of blood remained kept into an EDTA test tube. The blood was centrifuged for 10 minutes at 3500 rpm, fractionated, and conveyed to eppendorf cups before being stored at -20°C until analysis. The material was allowed to reach room temperature before being utilized for the analysis. COBAS E 411 Roche Hitashi apparatus was used to estimate estrogen. This research was conducted firmly below the moral guidelines later the authorization from Ethical Review Committee of PUMHSW Nawabshah. Categorical variables were presented in number and percentage (%), and continuous variables will be presented as mean \pm SD and median. ANOVA test was applied for comparison of serum estrogen levels among the study participants. SPSS (Statistical Package for Social Sciences) Version 22.0 was used to analyze the data.

RESULTS

Table 1 presents the estrogen level of the study groups. The mean value of serum estradiol of pre and postmenopausal participants was noted as 13.03 \pm 11.42 pg/ml 8.21 \pm 4.7 pg/ml respectively with highly significant difference of ($p < 0.001$).

Table: 1 Estrogen level among the study participants

Variable	Group-A Premenopausal Women	Group-B Postmenopausal Women	p-value
Estradiol (pg/ml)	13.03 \pm 11.42	8.21 \pm 4.7	<0.001

Table 2 and 3 shows the symptoms of menopause in premenopausal and postmenopausal participants. In group A 38.5% participants had the mild hot flashes, 14.0% had the moderate and 47.5% had no any symptom of hot flashes, while in Group B 20% participants had complaint of mild hot flashes, 49.5% had moderate and 30.5% had no any complaint of hot flashes. Among the premenopausal females 38.5% participants had mild heart discomfort, 14.0% had moderate and 47.5% had no any symptom of heart discomfort as compared to the premenopausal females, 9.5% of participants of postmenopausal women had mild Heart discomfort, 60% had moderate and 30% females had no any complaint of Heart discomfort. Among the Group A females 22.0% participants had mild symptom of depressive mood, 30.5% had moderate and 47.5% had no any symptom of depressive mood while among the participants of Group B 5% of females had mild symptoms of depressive mood, 54% had moderate depressive mood and 10% had severe symptoms of depressive mood while 30% of participants had no any symptom of depressive mood. 20% of premenopausal females had mild irritability, 30.5% had moderate irritability and 47.5% had no any irritability, as compared to the premenopausal females 5% postmenopausal females had mild irritability, 54% had

moderate irritability, 10.5% had severe while 30.5% had no any irritability. In Group A the 32.5% of participants had mild anxiety, 20% had moderate anxiety and 47.5% had no any anxiety while in Group B 5% of women had mild anxiety, 54% had moderate anxiety, 10.5% had severe anxiety while 30.5% of females had no any anxiety. Among the females of premenopause 20% females had mild physical and mental exertion, 20% had moderate while 58% had no any physical and mental exertion as compared to the premenopausal females 5% participants of postmenopause had mild physical and mental exertion, 54% of females had moderate, 10.5% had severe while 30.5% had no any physical and mental exertion. In Group A 20% of the participants had mild sexual problems, 20% had moderate while 58% had no any sexual problems while in Group B 5% of females had mild sexual problem, 54% had moderate, 10.5% women had severe and 30.5% women had no any sexual problem. Among the premenopausal females 20% participants had mild bladder problem, 20% had moderate bladder problems while 58% had no any bladder problem as compared to the premenopausal females 5% postmenopausal females had mild bladder problem, 54% had moderate, 10.5% had severe where as 30.5% females had no any bladder problem. In participants of Group A 20% of females had mild vaginal dryness, 20% had moderate where as 58% had no any complaint of vaginal dryness while in participants of Group B 59% of women had moderate vaginal dryness, 10.5% had severe while 30.5% had no any vaginal dryness. Among the premenopausal females 20% had mild muscle and joint problem, 20% had moderate while 58% had no any muscle and joint problem as compared to the premenopausal females the 59% of postmenopausal females had moderate muscle and joint problem, 10.5% had severe while 30.5% had no any complaint of muscle and joint problem.

Table 2: Symptoms of Menopause among Premenopausal participants

Sign and symptoms	Mild	Moderate	No any
Hot flushes	77 (38.5%)	28 (14%)	95 (47.5%)
Heart discomfort	77 (38.5%)	28 (14%)	95 (47.5%)
Depressive mood	44 (22%)	61 (30.5%)	95 (47.5%)
Irritability	44 (22%)	61 (30.5%)	95 (47.5%)
Anxiety	65 (32.5%)	40 (20%)	95 (47.5%)
Physical and mental Exertion	44 (22%)	40 (20%)	116 (58%)
Sexual problems	44 (22%)	40 (20%)	116 (58%)
Bladder problem	44 (22%)	40 (20%)	116 (58%)
Dryness of vagina	44 (22%)	40 (20%)	116 (58%)
Muscle and joint Problem	44 (22%)	40 (20%)	116 (58%)

Table 3 Symptoms of Menopause among Postmenopausal participants

Sign and symptoms	Mild	Moderate	Severe	No any
Hot flushes	40 (20%)	99 (49.5%)	00 (0.0%)	61 (30.5%)
Heart discomfort	19 (9.5%)	120 (60%)	00 (0.0%)	61 (30.5%)
Depressive mood	10 (5.0%)	108 (54.0%)	21 (10.5%)	61 (30.5%)
Irritability	10 (5.0%)	108 (54.0%)	21 (10.5%)	61 (30.5%)
Anxiety	10 (5.0%)	108 (54.0%)	21 (10.5%)	61 (30.5%)
Physical and mental exertion	10 (5.0%)	108 (54%)	21 (10.5%)	61 (30.5%)
Sexual problem	10 (5.0%)	108 (54%)	21 (10.5%)	61 (30.5%)
Bladder problem	10 (5.0%)	108 (54%)	21 (10.5%)	61 (30.5%)
Dryness of vagina	00 (0.0%)	118 (59%)	21 (10.5%)	61 (30.5%)
Muscle and joint problem	00 (0.0%)	118 (59%)	21 (10.5%)	61 (30.5%)

DISCUSSION

Reduction in hormone levels especially estrogen which may cause a wide variety of unpleasant symptoms, including anxiety, melancholy, decreased libido, vaginal dryness, sleeplessness, focusing difficulties, and vasomotor symptoms. After the menopausal transition, these symptoms can continue for years [8]. The mean values of estrogen concentration of postmenopausal women of present study was decreased as compared to the premenopause and normal healthy females. Soares and Freeman *et al.*, reported in their studies that levels of estrogen decrease with the increasing age of females which is contrast with the present study findings [9, 10]. Consistent with the Lee and Lee's study, the present study revealed that menopausal symptoms increased as the level of estrogen is decreased [11]. Dutta *et al.*, observed in their study that most common complaints of postmenopausal women were irritability, muscle or joint pain, hot flushes and night sweats [12]. In present study the findings of frequency of hot flushes, muscle and joint pain and irritability among the postmenopausal participants were found similar with the above mentioned study. Malik *et al.*, reported that very severe symptoms among postmenopausal women were joint pain, followed by sleep disorders, hot flushes, physical and mental exhaustion, depressive mood, dryness of vagina, heart discomfort, bladder problems, irritability, sexual problems and anxiety which was comparable with the current study [13]. The results of depressive mood, anxiety and physical and mental exertion of the current study participants were comparable with the Halbreich's study [14]. In premenopausal participants 20% had mild sexual problem, 20% had moderate and 58% had no any sexual problem and in postmenopausal females 5% had mild sexual problem, 54% had moderate, 10.5% had severe and 30.5% had no any sexual problem. Comparable findings were observed by Prairie *et al.*, and Rahman *et al.*, and in their studies [15, 16].

Simon *et al.*, estimated that women were suffering from vaginal dryness at the menopausal age [17]. The findings of vaginal dryness of present study were similar with the above study. Dąbrowska-Galas *et al.*, revealed that women after menopause face sexual problems which was consistent with the present study [18]. The participants of the current study had also complaint of sexual problems. In current study participants the symptoms of menopause were found severe in postmenopausal participants and the estrogen level was found less than the premenopausal females these findings were consistent with the Santoro *et al.*, and Aladhab *et al.*, studies [19, 20].

CONCLUSIONS

We concluded in this study that women after the menopause were at high possibility of menopausal symptoms and current study expected to understand the relationship of estrogen levels and symptoms of menopause in pre and postmenopausal women and aware about the risk factors of increasing age to the female population. Inappropriately, decreases in circulating serum estrogen in pre and postmenopausal women result in increased risk for a number of clinical health issues that can lead to increased mortality.

Authors Contribution

Conceptualization: NA, B

Methodology: NA

Formal analysis: GQ, MM¹, MM²

Writing-review and editing: SI

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article.

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