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The Relation of Menopause Duration with Estrogen Hormone Levels in Menopause Women 1-5 Years in Sukoanyar Village, Pakis District, Malang.

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Abstract: Menopause is the cessation of the physiological process of the menstrual cycle which is related to a woman's age. Permanent cessation of the menstrual cycle is caused by loss of activity of the ovarian follicles which is expressed when experiencing amenorrhea (no menstruation) for 12 months. The aim of this study was to determine the relationship between the duration of menopause and estrogen hormone levels in menopausal women 1-5 years in Sukoanyar Village, Pakis Malang District. This research was conducted in December 2023. This research is a quantitative descriptive study with a cross sectional approach, the sample size in this study was 93 respondents. Based on the frequency distribution, respondents who experienced menopause within 2 years were the respondents with the largest percentage, namely 29%. The frequency distribution of respondents based on estrogen levels ≥130 pg/mL was 42 respondents or 45.2%, while estrogen levels ≤ 130 pg/mL were 51 people or 54.8%. Meanwhile, based on the Pearson test, the Sig (tailed) value or p value was 0.509, which means the relationship between estrogen levels and length of menopause is said to be not significant. And based on the correlation value, it shows that the correlation level is very low
Keywords: Menopause, Estrogen, Menopause Duration

Introduction

Menopause is a stage that all women will definitely experience. Menopause indicates that a woman's menstrual and reproductive period has ended. Menstruation occurs at the end of the cycle that begins in adolescence. In general, women first experience menstruation at the age of 12, while menstruation ends at around the age of 45-53 years. Relatively few women start menopause at the age of 40 and some experience it after the age of 40. This period is known as premenopause (Santoro et al., 2021). The World Health Organization (WHO) estimates that in 2030 there will be around 1.2 billion women over the age of 50. As many as 80% of them live in developing countries and the population of menopausal women increases by three percent each year. The Indonesian Health Service stated that in 2025, the number of menopausal women in Indonesia is estimated to be 60 million. In 2016, Indonesia had only reached 14 million menopausal women or 7.4% of the total population. The estimated average age of menopausal women in Indonesia is 48 years (Putri et al., 2023).

As women age, the number of ovarian follicles decreases. There is a decrease in ovarian granulosa cells which are the main producers of estradiol and inhibin. With reduced estrogen and inhibin inhibition of gonadotropins, the production of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) increases. FSH levels are usually higher than LH levels because LH is cleared from the blood more quickly. Decreased estrogen levels disrupt the hypothalamic-pituitary-ovary axis. As a result, endometrial development fails, causing irregular menstrual cycles to stop altogether. Menopause can occur due to surgical procedures such as hysterectomy with bilateral oophorectomy. Menopause can be caused by treatment for certain conditions, such as endometriosis and breast cancer with antiestrogens and other cancers due to chemotherapy drugs (Peacock & Ketvertis, 2022).

Changes in estrogen hormone secretion in menopausal women cause various physical and psychological changes that are unique to women's reproductive development. This period is a complex life dynamic for women because it affects almost all aspects of their physical, psychological, sexual, and psychosocial dimensions. As a result of the decrease in estrogen hormones in brain tissue and brain cell structures, continuous mood swings become stressful and even depressive. Estrogen levels in the body provide information about important changes in the body regarding the process of sexual and

reproductive health, estrogen regulates important processes in the skeletal, cardiovascular, and central nervous systems that have an impact on the health of menopausal women (Zhuo Yu 2022). The level of estrogen levels in the body of menopausal women causes important changes in the woman's body which are influenced by the age of the menopausal woman and whether the duration of menopause is also related to estrogen levels in the body, so on this occasion the researcher is very interested in conducting research on the Relationship between Menopause Duration and Estrogen Hormone Levels in Menopausal Women 1-5 Years in Sukoanyar Village, Pakis District, Malang.

Materials and Methods

This study is a type of quantitative descriptive research using a Cross Sectional design. The population in this study were all menopausal women 1-5 years old 45-60 years in Sukoanyar Village, Pakis District, Malang, the population in the study was 121 people. The number of samples from this study were menopausal women 1-5 years old 45-65 years in Sukoanyar Village, Pakis District, Malang, a total of 93 people who met the criteria of menopausal women with a menopause duration of 1-5 years, aged 45-60 years, patients with composmentis conditions, cooperative, no physical mobility barriers. The study was conducted in the Pakis Health Center Working Area, in Sukoanyar Village in December 2023. The research variables in this study are divided into independent variables, namely the duration of menopause, while the dependent variable is the hormone estrogen. While the instrument in this study uses ELISA examination to examine estrogen hormone levels. Data analysis using Pearson Product Moment correlation technique

This research uses the following principles of research ethics: the five rights of human subjects in research consisting of Respect for autonomy, Privacy or dignity, Anonymity and confidentiality, justice and Beneficence and nonmaleficence. This study has been tested for ethics with the results of the ethical certificate number No: 06 / PHB / KEPK / 286 / 12.24.

Results

1.1 Respondent Characteristics Based on Age

Tabel 1 Respondent Characteristics Based on Age

No	Age	Frequency	Prosentase (%)
1	45 - 55	51	54,8
2	56 - 60	42	45,2
	Total	93	100

Based on the data in table 1 above, it can be seen that the majority of menopausal female respondents were aged 45-55 years, namely 51 people (54.8%).

1.2 Respondent Characteristics Based on Education Level

Tabel 2. Respondent Characteristics Based on Education Level

No	Education Level	Frequency	Prosentase (%)
1	SD	15	16.1
2	SMP	29	31,2
3	SMA	44	47,3
4	PT	5	5,4
	Total	93	100

Based on table 2, the highest level of education of respondents was high school, totaling 44 people (47%), and the lowest level, 5 people (5.4%) were bachelor's degrees.

1.3 Respondent Characteristics Based on Menopause Duration

Tabel 3. Respondent Characteristics Based on Menopause Duration

No	Menopause Duration	Frequency	Prosentase (%)
1	1 year	9	9,7
2	2 year	27	29
3	3 year	25	26,9
4	4 year	20	21,5
5	5 year	12	12,9
	Total	93	100

Based on table 3, respondents who experienced menopause for 2 years were the respondents with the largest percentage, namely 29%, and the duration of menopause for 1 year was the smallest, namely 9 people or 9.7%.

1.4 Respondent Characteristics Based on Menopause Duration with Estrogen Hormone Levels

Tabel 4. Respondent Characteristics Based on Menopause Duration with Estrogen Hormone Levels

No	Menopause Duration	Estrogen Levels ≤ 130 pg/mL	Prosentase (%)	Estrogen Levels ≥130 pg/mL	Prosentase (%)	Total
1	1 year	4	4,3	5	5,4	6
2	2 year	27	29	22	23,7	49
3	3 year	11	11,8	6	6,5	17
4	4 year	6	6,5	7	7,5	13
5	5 year	3	3,2	2	2,2	5
	Total	51	54,8	42	45,2	93

Based on table 4, estrogen levels ≥130 pg/mL were 42 respondents or 45.2%, while estrogen levels ≤ 130 pg/mL were 51 people or 54.8%.

Analysis of the Relationship between Menopause Duration 1-5 Years with Estrogen Levels in Menopausal Women in Plalar Hamlet, Pakis District, Malang Regency

Table 4 Analysis of the Relationship between Menopause Duration 1-5 Years and Estrogen Levels

Analis Uji Pearson	N	Correlation	Sig.
Estrogen and Duration of Menopause	85	0,130	0,216

Based on table 5.6, the analysis test of the relationship with the Pearson test shows the Sig. (tailed) value or p value obtained a result of 0.216, which means that the relationship between estrogen levels and the duration of menopause is said to be insignificant. And based on the correlation value, it shows a very low correlation level.

Discussion

Identification of the duration of menopause in menopausal women 1-5 years in Sukoanyar Village, Pakis District, Malang

Based on the research results as shown in Table 5.3, it can be seen that the duration of menopause for 2 years is the respondent with the largest percentage, namely 29%. The

duration of menopause is the time or how long a woman experiences menopause.

Menopause lasting 1-3 years means that the woman has entered a period where some of the reproductive organs have experienced a decline in function and quality, and some have even stopped functioning, such as menstruation, which will never be experienced again, and also the body's inability to produce hormones, which can have an impact on the rapid aging process, psychological disorders and sexual disorders. (Sari et al., 2018).

Another study conducted by (Mail & Yuliani, 2021) stated that menopause occurs at the age of 45-55 years. The results of the distribution of characteristics based on the duration of menopause with the longest duration of menopause being 32 people (39.5%) for 4-6 years and the least 3 people (3.7%) for 10-12 years. The results of the study conducted by (Akbar & Aurunisa, 2023) based on the distribution of characteristics based on the age of menarche, the most were at the normal age of menarche (12-14 years) totaling 79 people (97.5%).

Menopause age can come earlier or later, the problem is that menopause that comes earlier, of course it feels uncomfortable for women. Previous research states that the earlier menarche, the tendency is for menopause to be later, likewise the later menarche, the tendency is for menopause to be earlier(Mail & Yuliani, 2021)

Identification of estrogen hormone levels in menopausal women 1-5 years in Sukoanyar Village, Pakis District, Malang

Based on the research results as shown in Table 5.4, it can be seen that estrogen levels ≥130 pg/mL were 42 respondents or 45.2%, while estrogen levels ≤ 130 pg/mL were 51 people or 54.8%. Women's natural estrogen production will change over time, the peak of estrogen production in a woman's body is during puberty and the amount of estrogen will continue to increase during a woman's fertile period. However, when approaching menopause, estrogen levels in women slowly begin to decrease(BJ & Ojeda W, 2021).

As women enter menopause, the ovaries produce less estrogen, and this change in estrogen exposure has important effects on most tissues in the body. (Stachenfeld, 2017). A decrease in estrogen levels causes several psychological and physical changes. The most prominent symptoms are reduced energy and passion, reduced concentration and academic ability, the emergence of emotional changes such as irritability, difficulty sleeping, feelings of deprivation, loneliness, fear, ferocity, impatience, etc.(Widjayanti, 2016).

Previous research conducted by (Hall, 2020) said that with increasing age, there tends to be a decrease in estrogen hormones in menopausal women. While other studies state that However, during premenopause, a woman's body begins to produce more estrogen of a different type, called estrone, which is produced in the ovaries and in body fat. Serum estradiol levels in postmenopausal women are around 10-20 pg/mL and are mostly the result of estrone conversion, which is obtained from peripheral conversion of androstenedione. Estrogen levels in menopausal women are highly dependent on the conversion of androstenedione and testosterone to estrogen(Yulizawati & Yulika, 2022).

Analysis of the relationship between the duration of menopause 1-5 years with estrogen levels in menopausal women in Sukoanyar Village

Based on the research results as shown in Table 5.4, it can be seen that Sig.(tailed) or p value obtained a result of 0.216, which means that the relationship between estrogen levels and the duration of menopause is said to be insignificant. And based on the correlation value, it shows a very low correlation level.

With the entry of menopause, there is a decrease in estrogen levels, but this can be the opposite in obese women. (Ceccarelli et al., 2022). Estrogen is formed by granulosa cells in ovarian follicles through a series of conversions via enzymatic reactions. (BJ & Ojeda, 2021). Synthetic estrogen hormone will increase along with the development of follicles in

the ovaries. After ovulation and the formation of corpus luteum in the ovaries (luteal phase), this hormone decreases gradually until the end of the luteal phase. The age of menopause can be influenced by heredity, general health, lifestyle, chronic diseases and age of menarche.

The duration of menopause is the time a person goes through since the beginning of menopause. While menopause can be called the "preparation period for retirement" for women. A transition period from reproductive age to old age. This period is marked by the cessation of menstruation because the estrogen hormone is no longer reproducing. The age of menopause can be influenced by heredity, general health, lifestyle, chronic diseases and age of menarche(Mail & Yuliani, 2021).

Previous studies have shown that ovarian estrogen production begins to decline 1-2 years before menopause and reaches a nadir 2 years after menopause. Compared with estrogen levels in women of reproductive age, serum concentrations of estradiol and estrone (the primary circulating estrogen) are very low in the postmenopausal period.(Widyastuti, 2018). Other studies also mention that estradiol is formed by the conversion of estrone. Growth hormone secretion decreases by 30–40% after the age of 40 years, lower than at reproductive age(Sudirman et al., 2020).

Estrogen is not only released by the ovaries (gonads), but is also produced extragonadally, namely by the adrenal glands (reticular zone), subcutaneous fat, bones (osteoblasts) and the brain. This is what influences menopause to have different impacts and symptoms in each woman. In premenopause, estrogen is produced more in the ovaries, conversely in menopause production is more controlled in a number of extragonadal organs. Although the amount is not as large as when produced in the ovaries, the presence of extragonadal estrogen has a major influence on the continuity of the biological function of organs and tissues. In addition to the above factors, estrogen production in women is also influenced by lifestyle such as foods that support estrogen production, exercise, avoiding alcohol and cigarettes and providing a balanced opportunity for the body and psychology to be active and relax in a balanced way(Hetemäki, 2021).

Conclusions

Based on research on the Relationship between Menopause Duration Menopause duration 1-5 years with Estrogen Levels in Menopausal Women in Sukoanyar Village, the following conclusions can be drawn:

1. The frequency distribution of respondents who experienced menopause for 2 years is the respondent with the largest percentage, namely 29%
2. The frequency distribution of respondents based on estrogen levels ≥130 pg/mL was 42 respondents or 45.2%, while estrogen levels ≤ 130 pg/mL were 51 people or 54.8%.
3. The analysis of the relationship with the Pearson test showed a Sig. (tailed) value or p value of 0.216, which means that the relationship between estrogen levels and menopause duration is said to be insignificant. And based on the correlation value, it shows a very low correlation level.

Declaration of Interest

The authors declare that they have no conflict of interest

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Data Availability
The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request

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