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Androgen Hormones in Menopausal Women

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A B S T R A C T

Every woman will experience menopause at an age that is no longer productive. The age of menopause in women is from 40 years and above. This occurs due to a decrease in estrogen production in the egg cells, affecting the menstrual process. Every woman who experiences menopause because the levels of androgen hormones have increased much higher. This will make women experience menopause more quickly. There are two ways that can be done by reducing androgen levels in women, namely by using cashew biij and phytopharmaca. The method used in this study is mixed method where researchers used meta analysis systematic review using PRISMA flowchart. In this study, researchers focused on menopausal women using cashew seeds and focused on research on androgen hormones. This study shows that cashews have an important role in helping to reduce the levels of androgens in the female body. When androgen levels in a woman's body are high, it is necessary to reduce androgen levels to reduce body fat and not accelerate menopause. In this case, it is seen that the use of cashew seeds in androgen lowering can be used but cannot show a significant effect, which makes it necessary to use other alternatives in lowering androgen levels. When compared to phytopharmaceuticals, the use of katuk leaf extract is one treatment that can help increase uterine thickening thus affecting menopause in women. Androgen hormones will decrease due to the help of katuk leaf extract which causes an effect on uterine weight and endometrial thickness that affects menopause. Based on the results of the study, it can be concluded that the use of phytopharmaca using katuk leaf extract has more impact on androgen reduction in women compared to using cashew seeds. Although cashew seeds can provide a decrease, it does not show significant results

INTRODUCTION

Menopause is part of the female reproductive phase which is indicated by menstruation that stops due to the decreased production of the hormone estrogen. Every woman has a different reproductive system and this begins to appear from the age range of 40 to 50 years. Every woman will experience menopause because the body system is no longer able to produce estrogen hormones like women at a young age. By 2030, it is predicted that as many as 1.2 billion women will enter menopause. Meanwhile, predictions given in 2025 show that 60 million women will experience menopause. As we know, the population in Indonesia will always increase every year due to the high number of births. However, even so, adult women who have entered the age of 40 and above must be prepared to experience menopause (Ekasari & Yastirin, 2020).

Phytoestrogen comes from the word phyto which is defined as a plant and estrogen is defined as a steroid hormone found in the ovaries and placenta (Nasiroh, 2015). Phytoestrogens are defined as compounds found in nuts that are similar to estrogen produced in the female body. In this case, it is necessary to have sufficient nutritional needs in the female body to enter the menppause period with a level of kabohidrat equivalent to 60 percent and protein as much as 20 percent. This adequacy will help the production of phytoestrogens that increase estrogen production in the female body (Ekasari & Yastirin, 2020).

LITERATURE RIVIEW

Testosterone and androstenedione are the main androgen hormones whose role is to increase cells contained in the ovaries which are no longer fertilized. The role of androgens in granulosa cells forms the absence of development in female egg ovulation so that menopause is formed (Harlita et al., 2017). Women who will experience menopause will experience estrogen turnover to improve glycemic control with changes in control of the metabolism of the female body during menstruation. In this case, estrogen intake shows an influence that can be seen from high or low levels of estrogenic levels. Estrogen can be formed due to the presence of androgens that arise from the aromatase enzyme (Gregorio et al., 2021).

Androgens show metabolic effects in the sexes where the role of androgens in women is related to menopause, PCOS and so on that lead to the reproductive system. Women who experience menopause have androgen elements that are supported by central fat contained in the body. The decrease in andogen levels occurs due to some fat accumulation in the human body which will slowly form menopause. The higher the fat contained in the body, this will affect the process of androgens production which continues to increase (Bauset et al., 2022).

Decreasing androgens levels can be done by using nuts such as cashew seeds or with phytopharmaceuticals, which are plants that are used as natural ingredients which have been tested and produced as medicinal ingredients for consumption by women. Phytopharmaceuticals are formed from natural ingredients so that their safety and efficacy on the female body must be proven (Pawarta, 2017). However, sometimes, trials are more often conducted on

animals. This is because animals are one of the best tests before being put directly into the human body.

In this study, researchers focused on the use of nuts in the form of cashew seeds used in ovarian testing. Cashew is a plant produced to provide protein to the body. Harlita & Muzayyinah (2004) revealed that the extract contained in the cashew seed skin causes damage to the ovaries while Harlita et al., (2017) showed that the use of cashew seed skin extract can reduce androgen hormone levels in the ovaries and serum. Based on the research gap, the researcher wants to conduct a trial using cashew seeds in menopause experienced by women. In addition, there is no research that analyzes androgen hormones and phytopharmacology in menopausal women using cashew seeds.

The purpose of this study was to analyze androgen hormones in menopausal women by comparing the use of cashew sage and phytopharmaceuticals. It is hoped that this study can provide more in-depth education about androgen hormones in menopausal women. In addition, it is also hoped that this research can be used as a reference for future researchers who examine similar concepts, namely menopause, androgens and phytopharmacology.

METHODOLOGY

This research was conducted using the meta-analysis systematic review method. In finding answers to the problems that want to be discussed in research, systematic reviews attempt to compile all accessible empirical studies (Machmud, 2016). The statistical method used to assess and integrate data from several related studies is called meta-analysis (Putri et al., 2022). These two methods are suitable methods to be used in this study by forming a flowchart using PRISMA. The approach used in this research is classified as a mixed method approach because researchers will take descriptive and statistical research results.

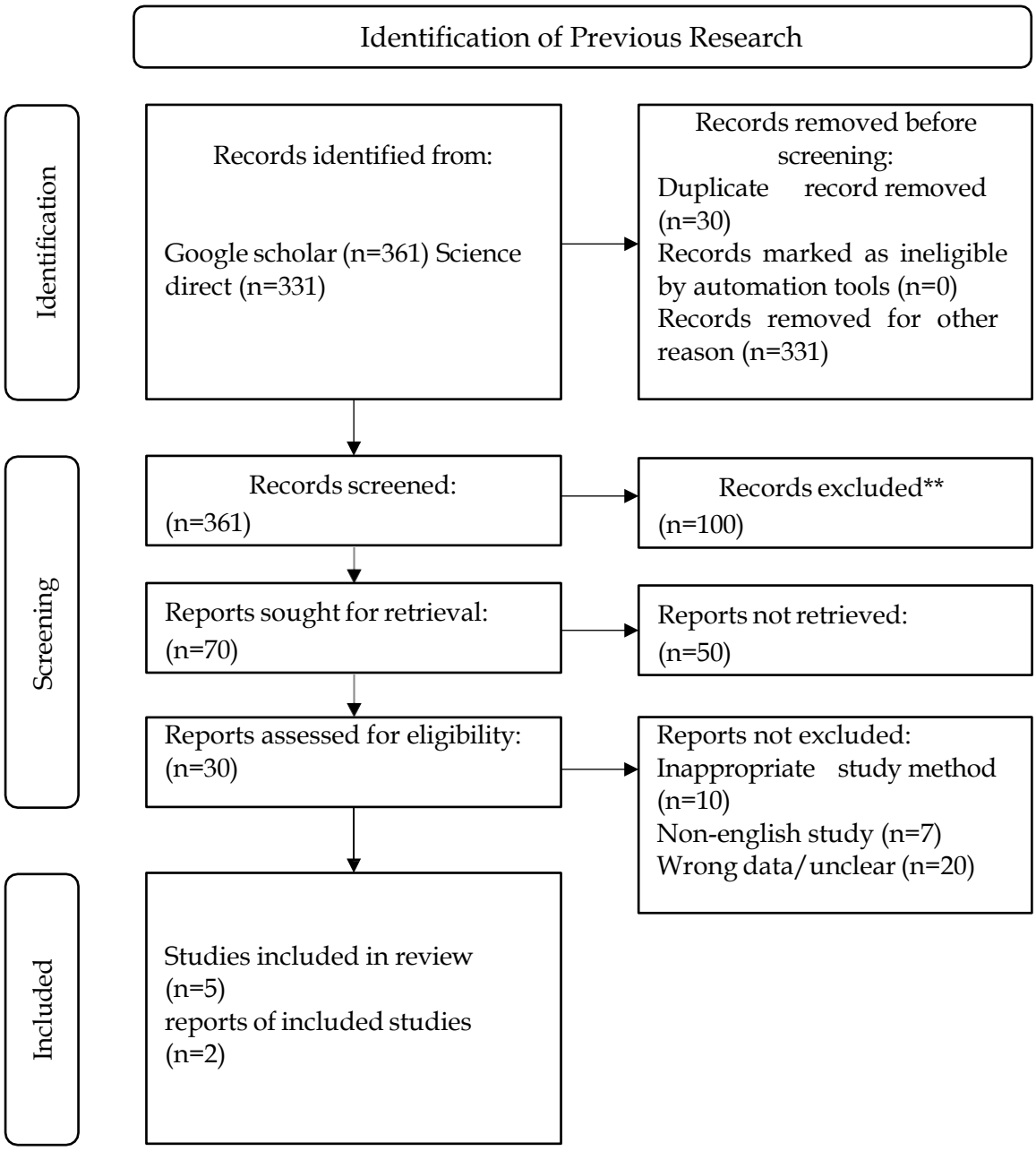

Figure 1. Prisma Flowchart for Study Selection

RESULT

Androgen hormones are found in the female body whose function is to take care of female reproductive organs and help the growth of female reproductive organs. The role of the astrogen hormone also has an impact on tissue repair contained in the female reproductive organs and also bone mass. Every woman is not allowed to have excessive androgen hormone levels because it will have an impact on stopping the menstrual cycle where women will experience menopause. Androgen hormones can be formed due to the consumption of nuts that have double and saturated fatty acid levels which can

affect lowering androgen levels in the female body so as not to accelerate the menopausal cycle.

Bauset et al., (2022) revealed that cashew seeds are part of nuts that have a high number of calories and are related to metabolic effects on the body.

Table 1. Androgen Hormone Levels

Treatment	Androgen hormone levels (ng/ml) at estrus cycle to		
	0	5	9
Control	57.24 ± 1,08[a]	61,76 ± 1,21[a]	63,03 ± 1,50[a]
250 mg/kg bb	57,26 ± 0,69[a]	59,63 ± 1,47[a]	62,20 ± 1,05[a]
500 mg/kg bb	58,25 ± 1,03[a]	59,03 ± 0,78[a]	61,98 ± 1,48[a]

Harlita et al., (2017) revealed that androgen hormone levels can be measured using estrus 0, 5 and 9. Based on the results obtained in the table above, androgen hormones show an increase in hormones in each cycle. This increase shows an insignificant effect because the increase in serum androgen levels has an effect on the immune system and accelerates the menopause process.

Table 2. Androgen Hormone Levels

Androgen hormone levels (ng/ml) at the 9th estrus cycle
70,98 ± 1,34[a]
70,92 ± 1,03[a]
69,97 ± 1,31[a]

Ovarian androgen hormone levels showed no significant difference but there was a decrease in androgen hormone by 0.06 ng/ml and 1.01 ng/ml. The test results prove that there is no difference between the treatment and control. In this case, the cashew seed skin extract used cannot have an effect on androgen hormone levels. The role of androgen is to form follicle development so that it can reduce hormone levels in the female body which should not be too high. Based on the above results, it can be seen that the extracted cashew seeds showed a decrease in androgen hormone levels but did not have a significant effect. The results of Wulandari's research (2015) showed that the use of katuk dauk extract as a form of phytopharmaca showed significance. The value obtained is 0.150> 0.05 where it is concluded that there is an effect.

Table 3. Calculation Results of the Effect of Katuk Leaf Extract on Menopause

SK	Treatment	JK	KT	F count	F5%
Treatment	4	11,4104	2,8526	460,0	2,76
Galat	25	0,1556	0,0062		
Total	29	11,566			

Based on the table above, the calculated F value is 460.0 > 2.76 which proves there is a significant difference. The level of difference found in the endometrium shows that the extract from katuk leaves can be used to reduce androgen levels in the female body. In the extract of katuk leaves there is an influence that can be shown on the uterus and endometrial thickness where this will affect the decline in menopause. Basically, the administration of estrogen hormones using phytopharmaceuticals will help provide an increase in uterine weight and endometrial thickness where when women consume cotton leaf extract, it will form an effect on the uterine wall.

Table 4. Statistical Test Results: Relationship Between Endometrial Thickness and Uterine Weight

$\sum x$	$\sum y$	$\sum xy$	R	R Square	A	b	Fcount	F table
3,89	1,49	5,39	0,85	0,72	0,58	0,27	5,29	2,87

Endometrial thickness and uterine weight based on the regression test showed a significant and positive value. The calculated F value is 5.291> F table 2.878 which indicates a strong relationship between endometrial thickness and uterine weight. The R square value shows 0.72 or equivalent to 72.3 percent where it is stated that endometrial thickness has a 72.3 percent relationship with uterine weight. Endometrial thickness is one of the factors that will affect uterine weight due to the presence of a layer that changes reproductive hormones and estrogen. The content of katuk leaf extract affects uterine weight and endometrial thickness which will provide a decrease in menopause. Therefore, the consumption of drugs is more able to affect androgen levels in the female body because it has been researched and tested beforehand. The phytopharmaceutical manufacturing process is produced based on the speed of reaction that affects the female body.

DISCUSSION

Menopause is a condition where a woman no longer experiences menstruation because the ovaries no longer produce female hormones. The ovaries that do not release eggs will stop the menstrual cycle process (Rahmawan, 2022). As a woman ages, her hormone production levels will decrease, causing her to stop menstruating. In this case, it should be noted that the highest hormone levels are androgen hormone levels. Slowly, androgen will decrease slowly because hormone production in the female body will form an imbalance between androgen and estrogen hormones. Therefore, some treatment is needed that can help the balance. The reason is that the levels of androgen hormones produced in a woman's body show high or excessive numbers. This condition is not good for the female reproductive system so Androgen hormone levels must be lowered to balance other hormones.

Androgen hormones are hormones that help maintain the health of the female body organs and control the performance of the body's reproductive system so that it does not show problems. Stable androgen hormone levels are

important to consider because with this balance, women can maintain the female reproductive system until menopause and after menopause. According to Harlita et al., (2017) the androgen hormone in the body must decrease because the egg will fail to ovulate and an increase in follicles is needed. The higher the androgen hormone levels, the more it will affect the ovum system, thus accelerating the menopause process in women.

The results of the study proved that cashew seeds can reduce androgen levels in the female body but did not show strong significance. Bauset et al., (2022) supported these results by revealing that women who are in a menopausal environment show higher fat accumulation so that this excess fat can become accumulated and make women experience menopause during menopause. This happens because estrogen levels decrease much faster than androgens so that if the two are not balanced it will affect the side effects during menopause, namely on the shape of the female body.

According to Harlita et al., (2017) the main androgens are divided into two types, namely testosterone and androstenedione. Extracts from cashew seed shells can make the androgen hormone cadro decrease due to the activity of the skin extract when entered into the body. In the study, mice were used as experimental trials which showed that each level of cashew seed extract that entered the body could have an effect on reducing androgen hormone levels in the body which is very important for menopausal women. As is known, menopausal women have a tendency to experience body and emotional changes due to unbalanced hormones in the body. In this case, the androgen hormone is one of the important hormones that need to be considered by women who are entering the menopause stage.

Nuts are high-calorie foods that are used to proportion saturated fats and fatty acids found in the human body. Nuts help humans to be able to process fiber in the body which has an impact on the work system of organs in the body. The increase of metabolic syndrome in the body of menopausal women can be prevented through the healthy lifestyle they consume. Bauset et al., (2022) revealed that women who want to live a healthy life should consume nuts to be able to provide a healthy diet and affect nutrition in the body. A strong metabolic system during menopause will result in fat accumulation and an increase in waist circumference where the effect on lowering blood pressure will not be seen.

The results of this study also show that phytopharmaceuticals using katuk leaf extract can show more significant effects. This is because katuk leaf extract comes from plants with high nutritional content. The extract of katuk leaves has a great effect in reducing androgen and testosterone hormones in the body which have an impact on the condition and emotions of women (Andini, 2014). Wulandari (2015) revealed that the use of katuk leaf extract as a form of phytopharmaca is able to change reproductive tissue in women.

Phytopharmacology uses the isoflavone content of katuk leaf extract to exert estrogenic effects and can provide thickening of the endometrium. Katuk

leaf extract is a natural ingredient that can be used safely because with natural katuk leaf extract, the reproductive system of the female body will experience more natural treatment assistance.

According to Andini (2014), katuk leaves have the potential as an aphrodisiac which is used as an active compound to reduce androgen hormone levels that are too high in the female body. Through the decreased androgen hormone levels, menopausal women will have more emotional stability and not show any side effects that occur due to the androgen system that is too high and unbalanced with other reproductive hormones contained in the female body. So, it can be concluded that the use of leaf extract as a phytopharmaceutical has more potential to help reduce androgen hormone levels because the effect given is 72 percent.

CONCLUSIONS AND RECOMMENDATIONS

Menopause is a process experienced by every woman who is over 40 years old. Menopause can occur because women no longer produce ovaries similar to their youth. Menopause has several effects such as changes in the body becoming larger or even obese, mood changes, physical changes and so on. Menopausal women have androgen and esterogen levels to consider in their body where both need to be more balanced. However, androgen levels in the body show higher levels so this makes menopausal women have side effects during menopause.

In lowering androgen levels that are too high, menopausal women can use phytopharmacology through the drug katuk leaf extract which is used to affect the reproductive system in the body. Katuk leaf extract has more nutritional content and is a natural ingredient that is good for affecting nutrition. Katuk leaf extract has more content and is good for consumption by menopausal women compared to cashew seeds. Although both have the same content. However, katuk leaf extract shows more natural content. Therefore, phytopharmaceuticals are more suitable for use in reducing androgen levels in menopausal women.

Suggestions that can be given from this study are that future researchers can conduct experiments on katuk leaves and cashew seeds simultaneously so that differences can be seen with the same time. In addition, it is also recommended for women who are in the pre-menopausal period to be able to consume cashew seeds so that during menopause women can consume phytopharmacia to reduce androgen levels in their bodies.

FURTHER STUDY

The limitations of this research lie in the lack of literature with related research themes, as well as limited time, so that the data obtained by researchers is still not optimal.

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