

**THE ROLE OF GINGER ADMINISTRATION TOWARD OXIDATIVE STRESS IN WOMEN'S HEALTH REPRODUCTION: A LITERATURE REVIEW**

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**Keywords:**

*Ginger; Oxidative stress; Women; Health Reproduction; Reproduction*

**ABSTRACT**

*Objectives This study as a system review was aimed to review the role of ginger administration in reducing oxidative stress level for women in their reproduction health. This was literature review to give further information about the role of ginger in reducing oxidative stress condition and was written with the help from secondary data analysis such as databases, various journals, books, articles and key words*

*Result Ginger could be one of the alternative medicine to treat reproductive problems like PCOS, help the implantation process in the uterus, normalized estrogen and progesterone imbalance, reduce cortisol level which can affect women fertility, and help women to deal with premenstrual syndrome*

*Conclusion Ginger commonly used in herbal medicine and has antioxidant and anti-inflammatory effect on women's health reproduction due to its flavonoid, phenolic compounds and the active antioxidant such as shagaols, gingerol, zingerone to prevent ROS buildup.*

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**INTRODUCTION**

Adequate administration of micronutrient supplementation leads to improvement of nutrition in young women who intended to pregnant (1) Studies have shown that overnutrition and lifestyles promote free radicals production and affect female fertility (2) Oxidative stress is imbalance condition between free radicals and antioxidant, this condition can leads to several reproduction complication such as endometriosis, PCOS, infertility, miscarriage, preeclampsia, IUGR, premature and pre-labour rupture

membrane (3) *Polycystic Ovarian Syndrome* (PCOS) is associated with reproductive complication and metabolic disorders which characterized by irregular menstruation, oligo, or amenorrhea, unovulation (4) Natural medicine is used commonly over 80 % of the world population. Ginger (*Zingiber officinale*) is one of the natural dietary component and has an antioxidant properties (5) Ginger extract has a significant natural antioxidant by scavenging superoxide radicals and lipid peroxide (6) Complementary treatment that commonly used for women reproduction problem is Ginger. It has

been used for pain treatment such as dysmenorrhea since ginger has a role to suppress the synthesis of prostaglandin (7)

Cortisol level as an indicator for oxidative stress secreted by the adrenal cortex as physiological response and the escalation of glutathione hormone as the main antioxidant as a response as well (6,8-10) Gelam honey and Ginger combination significantly reduce triglyceride level and showed a significant decrease of MDA concentration in diabetic rats which diabetic conditions might occurs in pregnancy periode (11). The imbalance of antioxidant and prooxidant cause lipid peroxide, in previous studies the administration of ginger and rosemary oil combination reduce rats cholesterol level significantly since those materials contain gingerol, shagaols, zingerone, and paradol which has hipolipidemic effects (12) Ethanol substance in ginger can prevent oxidative stress and increase activity of enzymatic and nonenzymatic antioxidant (6) this review study provides overview of the current role of ginger and

other mixture for women health reproduction

## METHODS

This article was identified based on study question. The keywords are Ginger; Oxidative Stress; Women; Reproduction; Health Reproduction or the combination of the keywords and searched through Pubmed, Hindawi, Elsevier, ScienceDirect for relevant studies in exploring the role of ginger toward oxidative stress in women health reproduction.

## RESULT

Following the inclusion criteria in the search was found 84 articles, and were filtered in the last 5 years. From the six selected articles most of them used in vitro or in vivo study design to determine the role of ginger toward oxidative stress for women health reproduction. Based on the 6 selected articles mainly discuss about ginger's role as an antioxidant.

Table 1. Characteristics, Instruments, and Results of Selected Studies

Author	Purpose	Population	Instrument	Study Design	Result
Yilmaz et al, 2017	To investigate ginger powder effect of ovarian folliculogenesis and implantation in rats	Female albino rats	Histopatological and immunihistochemical examination	In vivo laboratory research	Ginger which has antioxidant substance give a positive effect on folliculogenesis in short term and may enhance implantation in rats in long term
Najim, 2017	To give further information of ginger phytochemistry			Systematic review	It was found that ginger is useful in many acute and chronic conditions such as nausea, vomiting, menstrual cramp, reducing gas, joint pain, asthma, congestive conditions, and as an aphrodisiac

Table 1. (Cont.)

Author	Purpose	Population	Instrument	Study Design	Result
Pasciu et al 2019	Evaluate curcuma and ginger mixture as natural antioxidant could protect cells against ROS induced by BPS on hepatic cells	Male Wistar rats	Folin-Ciocalteu assay and Molecular Probes	In vitro study	Curcuma and ginger mixture was able to decrease ROS production in hepatic cells
Atashpour et al, 2017	To compare effectiveness ginger with clomiphene citrate on sexual hormones	Adult Female Wistar rats (7-8 wk)	Biochemical measurement and Sexual hormones measurement kits	Experimental and randomized study	Ginger as herbal medicine can be effective and good alternative in improving PCOS by improving FSH serum level
Permatasari et al, 2020	To investigate the effect of ginger honey and cocktail honey on decreasing cortisol hormone levels	Balb/c Female mice	Cortisol kit	ELISA In vivo study pre-test-post-test control grou	Ginger honey combination could significantly reduce cortisol hormone levels and can be used as a supplement to deal with stress.
Khayat, 2014	To evaluate effects of ginger on severity of symptoms of PMS	Female students	Daily record scale questionnaire	Clinical trial, double-blinded work	Ginger is effective in the reduction of severity of mood and physical and behavioral symptoms of PMS and suggest ginger as treatment for PMS.

## DISCUSSION

From the six article above ginger's role as an antioxidant could significantly reduce oxidative stress condition. Ginger suppress ROS buildup and maintain free radicals in physiology condition for proper function and homeostasis, the active antioxidant such as shagaols, gingerol, zingerone present antioxidant activity which involved in generation of ROS (Reactive Oxygen Species) (13) Ginger has free radical and protective DNA damage effects since it has volatile oil (14) In male Wistar rats induced by free radical the mixture of ginger and curcuma at the 100 mcg/ml dose was able to decrease ROS 32% and 43% in hepatic cell treated with 150 and 70 mcg/ml BPS, curcuma and ginger combination could be an efficient diet strategy to prevent pro-oxidant effect of BPS (15) In other reproductive and metabolic disorders like PCOS is characterized by increasing of LH, testosterone, and prolactin hormones, the administration of 100 mg, 175 mg, and 350 mg/kg/day for 88 days in adult female rats could decrease LH and estrogen level and increased FSH and progesterone level, Ginger extract has better effects to treat PCOS, Flavonoid and phenolic compounds in ginger could exhibit antioxidant activity and make balance between estrogen and progesterone hormone (16) in the recent studies, ginger honey mixture with 28 mg/kg/day for 14 days could decrease cortisol level as the indicator of oxidative stress (17). The existence of stressful that leads to oxidative stress conditions can suppress the circulation of gonadotropins and steroid hormones, which will result in the disruption of the menstrual cycle. The decrease in GnRH is due to the increased secretion of CRH (18) Beside its antioxidant effect, ginger has anti-inflammatory effect as well for women health reproduction, Ginger inhibit the metabolism of cyclooxygenase and lipoxygenase to prevent prostaglandin

production, this can help women to deal with premenstrual syndrome such as dysmenorrhea (19)

## CONCLUSION

Ginger is one of the natural herbal medicine that commonly used in complementary or alternative treatment. It has so many benefits for young and adult women since it is rich of antioxidant such as flavonoid and phenolic compounds and other mineral that women needed to prepare themselves to face pregnancy and maintain their reproduction system. Natural or herbal medicine is preferable due to minimum side effects even it consumed with high dose.

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