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Impact of Yoga on Hormonal Balance in Women: A Systematic Review

Nivedita Thakar[1], Sumeet Jani[2*], Dinesh Panchal[3]

[1]*Lakulish Yoga University, Ahmedabad, Gujarat.*
[2*]*Central University of Gujarat, Gandhinagar, Gujarat, Email: sumitjani71@gmail.com*
[3] *Lakulish Yoga University, Ahmedabad, Gujarat.*

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Abstract:

Hormonal balance is essential for maintaining women's reproductive, metabolic, psychological, and overall health. Various endocrine disorders, including Polycystic Ovary Syndrome (PCOS), hypothyroidism, menstrual irregularities, and menopausal symptoms, are often associated with hormonal imbalances that significantly affect quality of life. Modern lifestyle factors such as chronic stress, unhealthy dietary habits, and physical inactivity further contribute to endocrine dysfunction through disruption of neuroendocrine pathways. Yoga, a holistic mind–body practice incorporating physical postures (asanas), breathing techniques (pranayama), and meditation, has gained increasing attention as a complementary approach for hormonal regulation. This systematic review examines the physiological mechanisms through which yoga influences hormonal balance and evaluates its effectiveness in managing common hormonal disorders in women. Evidence from published studies indicates that yoga positively modulates the hypothalamic–pituitary–ovarian (HPO), hypothalamic–pituitary–thyroid (HPT), and hypothalamic–pituitary–adrenal (HPA) axes, leading to reduced cortisol levels, improved autonomic nervous system balance, enhanced insulin sensitivity, and better regulation of reproductive hormones. Yoga has demonstrated beneficial effects in women with PCOS, hypothyroidism, menstrual disorders, and menopause by improving hormonal profiles, menstrual regularity, metabolic health, emotional well-being, and quality of life. The findings suggest that regular yoga practice can serve as an effective non-pharmacological adjunct therapy for promoting hormonal balance and supporting women's endocrine and reproductive health. Further large-scale clinical trials are recommended to establish standardized yoga protocols and strengthen the evidence base.

Keywords: Yoga, Hormonal Balance, Women's Health, Polycystic Ovary Syndrome (PCOS), Hypothyroidism, Menstrual Disorders, Menopause, Endocrine System, HPO Axis, HPA Axis, Pranayama, Stress Management.

Introduction

Women's hormones are crucial for their health and general well-being because they regulate different functions within their bodies such as metabolism, reproductive capacity, mood, and the immune system. It involves a complex network of endocrine glands that includes the hypothalamus, the pituitary gland, the thyroid gland, and ovaries. These glands produce and secrete hormones that help maintain all bodily functions. Hormonal imbalances, even small, could cause serious physical or mental health problems.

Women typically experience several phases that naturally affect their hormones, including puberty, menstruation, pregnancy, and menopause. However, persistent hormonal imbalance could result in conditions like Polycystic Ovary Syndrome (PCOS), Hypothyroidism, menstrual disorders, infertility, and metabolic problems. It is known that Polycystic Ovary Syndrome is a common endocrine disorder among women. It affects 6-20% of women in the reproductive years worldwide (Azziz et al., 2016).Similarly, disorders of the thyroid gland, such as Hypothyroidism, are quite common among women. These conditions are commonly accompanied by symptoms like fatigue, weight gain, and reproductive difficulties (Taylor et al., 2018).

Several contemporary lifestyle factors like continuous stress, lack of exercise, unhealthy dietary choices, and exposure to environmental chemicals are considered to be significantly related to the pathogenesis of female hormonal imbalance. Continuous stress activates the hypothalamic-pituitary-adrenal (HPA) axis which stimulates increased release of cortisol in the body. Higher cortisol levels may have a suppressive effect on other reproductive hormones such as estrogen and progesterone (Chrousos, 2009).Additionally, mental health disorders like anxiety and depression have a strong association with hormonal imbalance (Gordon et al., 2015).

Thus, maintaining hormonal balance is crucial to ensure women's reproductive capacity, metabolic balance, and emotional health. Recently, an increase in interest for non-pharmacological treatment such as yoga has been observed for treating hormonal imbalance. Yoga involves the use of different asanas (physical poses), pranayama (breathing techniques) and meditation for treating health problems by targeting neuroendocrine functions.

A number of prevalent endocrine and reproductive disorders are associated with hormonal imbalance in women and cause significant detrimental impact on women's quality of life, fertility, and health. In the endocrine system and reproductive organs, conditions such as Polycystic Ovary Syndrome, Hypothyroidism and menstrual disorders are quite prevalent.

Polycystic Ovary Syndrome (PCOS)

Polycystic Ovary Syndrome is one of the most common endocrine disorder found among women of reproductive age. Hyperandrogenism (high male hormone level), ovulatory dysfunction and polycystic ovaries is what characterized the syndrome. Women suffering from this condition mostly complains of irregular menstruation, infertility, acne, and increased hair growth (hirsutism). Resistance to insulin plays a significant role in causing the metabolic disturbances related to PCOS, such as obesity and type 2 diabetes. Worldwide, the prevalence of PCOD varies between 6% and 20% according to different diagnostic criteria (Azziz et al., 2016). Aside from affecting the reproduction of the women, it poses long-term risks of cardiovascular and metabolic diseases.

Hypothyroidism

Hypothyroidism is the state in which the thyroid gland does not produce sufficient amount of thyroid hormone which causes the slow down of metabolic activity. More women are prone to be diagnosed with the condition compared to men. Fatigue, increased weight, depression, intolerance to cold and irregular menstruation are the common clinical signs of hypothyroidism.Thyroid hormones have an integral role in regulating metabolism, development, and reproduction. If undiagnosed or untreated, infertility and negative pregnancy outcomes are expected to be observed, as well as an increase cardiovascular risk. Prevalence of thyroid disorder increased world wide and especially among women (Taylor et al., 2018).

Menstrual Disorders

Menstrual disorders are a range of problems associated with normal menstrual cycle including infrequent menstrual cycle (oligomenorrhea), no menstruation (amenorrhea) and painful menstruation (dysmenorrhea). Hormonal imbalance involving estrogen and progesterone often lead to such disorders. Stress, improper nutrition, vigorous physical activity and endocrine diseases are common causes to disrupt regular menstrual cycle. Menstrual irregularity is common among adolescent girls and women of reproductive age, leading to inconvenience, emotional problems and daily functioning disturbances (Deligeoroglou et al., 2010). Adequate hormone balance is necessary to ensure regular menstrual cycles.

Modern lifestyle causes contributing to hormonal imbalance in women

The contemporary era is facing radical shifts in women lifestyle, as a result of increasing urbanization, occupational stress and changes in behaviour, which contributed to increase in incidence of endocrine and

metabolic disorders because of disruption of intricate hormonal regulatory network. Several major lifestyle-related factor, namely psychological stress, improper nutrition and physical inactivity are involved through neuroendocrine mechanism in creating hormone imbalance which affect female reproduction and metabolism. Chronic Psychological Stress

Chronic Stress

The main factor responsible for hormonal imbalance in women is chronic stress. In this context, the hypothalamic-pituitary-adrenal axis is the key system that causes sustained hormonal release (cortisol). Cortisol secretion, although it is needed to maintain survival and for normal function, causes significant endocrine imbalance when released chronically. High cortisol levels affect the pulsatile secretion of GnRH and subsequent reduction in LH and FSH levels, resulting in irregular ovulation and disordered menstrual cycles. Depression, anxiety and sleep disorders have strong links with chronic stress and have profound effect on hormonal balance. Insulin resistance, a major feature of Polycystic Ovary Syndrome, also becomes more significant due to hormone imbalance during chronic stress. Increased androgen levels are also present along with decreased immune function and increased systemic inflammation as part of a chronic stress response (Chrousos, 2009).

Unhealthy Dietary Pattern

The endocrine system is fundamentally a 'regulated system' that is dependent on the input and the nutrients it is receiving. Our typical modern diet includes ultra processed foods, refined carbohydrates, trans fats, sugary beverages which contribute to significant hormonal imbalance. Insulin resistance, a key issue causing PCOS, develops in response to fluctuations in blood glucose and subsequent increased insulin levels. This high level of insulin is then considered a driving factor for ovarian androgen production. These affect both estrogen and progesterone balance, leading to infertility andirregular periods. Micronutrient deficiency likevitamin D, magnesium, zinc and omega-3 fatty acids also affects hormone production and receptor activity. Vitamin D deficiency has been strongly related to poor reproductive health and thyroid functioning. Obesity induced due to an unhealthy diet also acts as an 'endocrine organ' through production of adipokines, estrogen like compounds thus interfering with overall hormonal homeostasis (Gaskins & Chavarro, 2018).

Physical Inactivity and Sedentary Lifestyle

Our increasingly desk bound and digital lifestyles have increased physical inactivity among women andmen. This lifestyle profoundly affects metabolic rate and endocrine regulation by leading to decreased insulin sensitivity and increased body weight, specifically increased visceral fat, which is known to affect estrogen metabolism and hormone levels, cause menstrual disturbances and possibly lead to hypothyroidism, obesity and the metabolic syndrome.Regular exercise has been demonstrated to be responsible for improved insulin sensitivity, reduced cortisol and increased endorphin and serotonin levels which affect positively reproductive health andmood, stimulate thyroid hormones secretion and boost up the metabolism (Booth et al., 2012).

Lifestyle and Hormonal Regulation Interplay

It is crucial to understand that the mentioned lifestyle factors are interconnected. Poor eating habits and sedentary living can contribute to chronic stress, which in turn can negatively impact eating and physical activity. The result is a cyclic progression leading to endocrine disorders in women. This is why it's necessary to approach lifestyle changes in a comprehensive way-stress management, proper nutrition and exercise are all critical for re-establishing hormonal balance.

The Endocrine System: A Physiological Basis of Hormonal Regulation

Women's bodies have a highly coordinated system, primarily under endocrine control, to maintain a stable internal environment and regulate various processes, such as growth, metabolism, reproduction, and emotional balance. The hypothalamus, pituitary, and ovaries work in conjunction to regulate the women's hormonal balance through the so-called hypothalamic-pituitary-ovarian (HPO) axis.

Overview of the Endocrine System

The endocrine system includes ductless glands that produce and secrete hormones directly into the bloodstream. Hormones function as chemical messengers controlling several physiological actions, including metabolism, stress response, reproductive system, and other processes. Women have several vital endocrine-controlled functions:

- Menstrual Cycle Regulation
- Fertility and Ovulation
- Secondary Sex Characteristic Development
- Pregnancy Support
- Emotional and Mental State Maintenance

The dysfunction of this complex system can cause diseases such as Polycystic Ovaries, Hypothyroidism and other hormonal imbalances.

Role of Hypothalamus

The hypothalamus is a tiny region located at the bottom of the thalamus in the brain. It serves as the central control station, interconnecting the endocrine and nervous systems. The key hypothalamus functions related to the hormonal regulation include:

GnRH, that is necessary for women's proper reproductive functioning, should be secreted at regular intervals (in the form of bursts, called GnRH pulses). Any impairment of the hypothalamic functioning (whether due to stress, lack of nutrients or the women's lifestyle) may result in disruption of GnRH pulsed signals and, subsequently, affect the levels of hormones further down the cascade. Long-term stress increases the release of Cortisol, which in its turn blocks the release of GnRH, thereby causing the irregular women's periods (Chrousos, 2009).

Role of the Pituitary Gland

The pituitary gland is known as the master gland and it's located at the base of the brain, under the control of the hypothalamus. The pituitary gland's main function related to women's reproductive hormone regulation includes the secretion of Luteinizing hormone (LH) and Follicle-Stimulating hormone (FSH).

- Important hormones:
- Luteinizing Hormone (LH)
- Follicle-Stimulating Hormone (FSH)
- Key Functions:
- LH stimulates the maturation and release of eggs from the ovaries and promotes corpus luteum development after ovulation.
- FSH stimulates the growth of ovarian follicles and subsequent development of estrogen.
- Menstrual cycle control
- Supporting fertility
- Any imbalance in the LH and FSH hormones will contribute to lack of ovulation and menstrual problems, and it is characteristic for Polycystic Ovaries.

Role of the Ovaries

The ovaries are women's primary reproductive organs and they're responsible for egg development and secretion of sex hormones.

- Major hormones secreted:
- Estrogen
- Progesterone
- Minor amounts of androgens
- Key Functions:
- Regulating women's menstrual cycle
- Stimulating development of secondary sexual traits in women
- preparing the woman's uterus for pregnancy

Maintained by progesterone. The ovarian hormones Estrogen causes the uterine endometrium to proliferatively change, and Progesterone to ensure stability and receptivity of the endometrium during the luteal phase. An imbalanced level between them will lead to irregular menstruation and problems with conception and childbirth.Hypothalamic–Pituitary–Ovarian (HPO) Axis Integration

The HPO axis functions as a feedback-controlled system:

1. Hypothalamus releases GnRH
2. Pituitary releases LH and FSH
3. Ovaries produce estrogen and progesterone
4. These hormones provide feedback to hypothalamus and pituitary

Mechanism: How Yoga Affects Hormonal Balance

Yoga manages hormonal equilibrium through numerous interwoven neuroendocrine and physiological pathways. It specifically targets the brain-endocrine-nervous system axis, thereby improving the coordination and connection between the hypothalamus, pituitary gland, and specific endocrine target organs. When performed regularly, the practices of asanas, pranayama, and meditation lead to the restoration of hormonal homeostasis by mitigating stress, regulating autonomic activity, and promoting the proper function of endocrine glands.

Stress Reduction and Cortisol Regulation

One of the most universally known beneficial outcomes of yoga is the amelioration of stress in both the psychological and physiological domains. Prolonged, chronic stress stimulates the hypothalamic-pituitary-adrenal (HPA) axis. This then leads to an increase in cortisol secretion. Excessive cortisol, in turn, leads to a disruption of reproductive hormones such as estrogen and progesterone; it has been associated with the development of irregular menses, infertility, and endocrine and metabolic disorders.

Regular yoga practice has been shown to significantly decrease the level of cortisol in women, allowing them to return to hormonal homeostasis and improve endocrine functionality overall. Stress reduction through yoga has proved especially useful in stress-related diseases, such as Depression and Polycystic Ovary Syndrome (Ross & Thomas, 2010).

Nervous System Balance: Parasympathetic Activation

Yoga shifts the balance from sympathatic(fight-or-flight) dominance to parasympathetic (rest-and-

digest) dominance. This equilibrium between the sympathetic and parasympathetic divisions of the autonomic nervous system is absolutely critical for maintaining hormonal homeostasis.

Increased activity of the parasympathetic nervous system can lead to:

- Lower heart rate and blood pressure
- Decrease in cortisol secretion
- Better digestion and metabolism
- Restored reproductive hormonal functioning

In this more rested state, the endocrine system is able to function efficiently at optimal capacity to promote normal functioning and secretion of both GnRH, LH, and FSH.

HPA Axis Regulation

The HPA axis plays a very significant role in managing hormonal activity and stress. Yoga normalizes the activity of the HPA axis, by downregulating the activity of the hypothalamus and restoring stable, effective communication between the pituitary and adrenal glands. Yoga has the effect of increasing the sensitivity of the HPA axis feedback mechanism to prevent chronic stress-induced elevations of cortisol that can lead to hormonal imbalance.

This is considered one of the main neuroendocrine pathways by which yoga can provide benefits.

Improved Circulation to the Endocrine Glands

By means of yoga postures, there is enhanced circulation and improved delivery of oxygen to the pituitary, thyroid, and ovarian glands. Good circulation to the endocrine glands allows optimal glandular functioning and hormone secretion to occur. Yoga poses which involve inversion, and stretching have particularly been shown to be beneficial:

- Increase blood return in veins
- Improve oxygenation of body tissues
- Improve delivery of nutrients to glands
- Facilitate detoxification process

By these physiological mechanisms, hormonal regulation occurs more efficiently.

Pranayama and Autonomic Balance

Pranayama (control of the breathing process) also has a role to play in autonomic nervous system regulation. When practicing deep, controlled, slow breathing patterns, the vagus nerve is stimulated, which increases activity in the parasympathetic nervous system, and thus the response to stress decreases.

Positive effects of pranayama include:

- Lower cortisol levels
- Increased efficiency of oxygen exchange
- Stable heart rate variability
- Regulated neuroendocrine signaling

These mechanisms contribute to the balance of both reproductive and metabolic hormones in the woman.

Meditation and Neuroendocrine Stability

Yoga meditation influences activity in a number of brain regions (hypothalamus, amygdala, and prefrontal cortex) which are critical for control of emotions as well as hormone regulation. It is found that in practitioners of yoga meditation there is:

- Reduced activity in the 'stress centers' in the brain
- Increased secretion of serotonin and dopamine
- Improved emotional stability
- Normal regulation of the hypothalamus and consequently, hormonal release.

Through the neuroendocrine pathway, GnRH, LH, FSH, estrogen and progesterone are produced in balanced amounts, thus reproductive function is improved.

Overall Mechanistic Integration

The effect of yoga on the neuroendocrine system can be understood as follows: The endocrine system as a whole gains benefits from this reduction of stress-induced cortisol secretion; autonomic nervous system balance; improved delivery of blood to endocrine glands; improved regulation of the HPA axis; increased brain-hormone signaling to help establish and maintain hormonal balance within the woman. All these contribute to minimizing endocrine dysfunction in the woman.

Specific Hormonal Conditions and the Effects of Yoga

As the mechanisms by which yoga positively influences the neuroendocrine system and the entire physiology of a woman are beginning to be elucidated, researchers have explored the effects of yoga for specific conditions of hormonal dysregulation, particularly for women, such as polycystic ovary syndrome, thyroid dysfunction, menstrual irregularities and the symptoms of menopause.

Yoga and PCOS

The polycystic ovary syndrome is characterized as an endocrine-metabolic disorder encompassing the symptoms of hyperandrogenism, insulin resistance and lack of ovulation. It is considered one of the leading causes of infertility in women of reproductive age. Research suggests that yoga can be used in managing the symptoms associated with PCOS due to

a number of different mechanisms:

- Reduction of insulin resistance and improvement in glucose metabolism
- Decreased levels of androgens due to a reduction in cortisol secretion induced by stress
- Improved regularity of the menstrual cycle and an increased frequency of ovulation
- Aid with weight control and reduction in abdominal fat
- Reduction in anxiety and improved psychological state

Clinical studies suggest that regular yoga practice improves hormonal profiles, including LH/FSH ratio normalization and reduced testosterone levels. Stress reduction through yoga also plays a crucial role in breaking the vicious cycle of hormonal imbalance in PCOS (Nidhi et al., 2012).

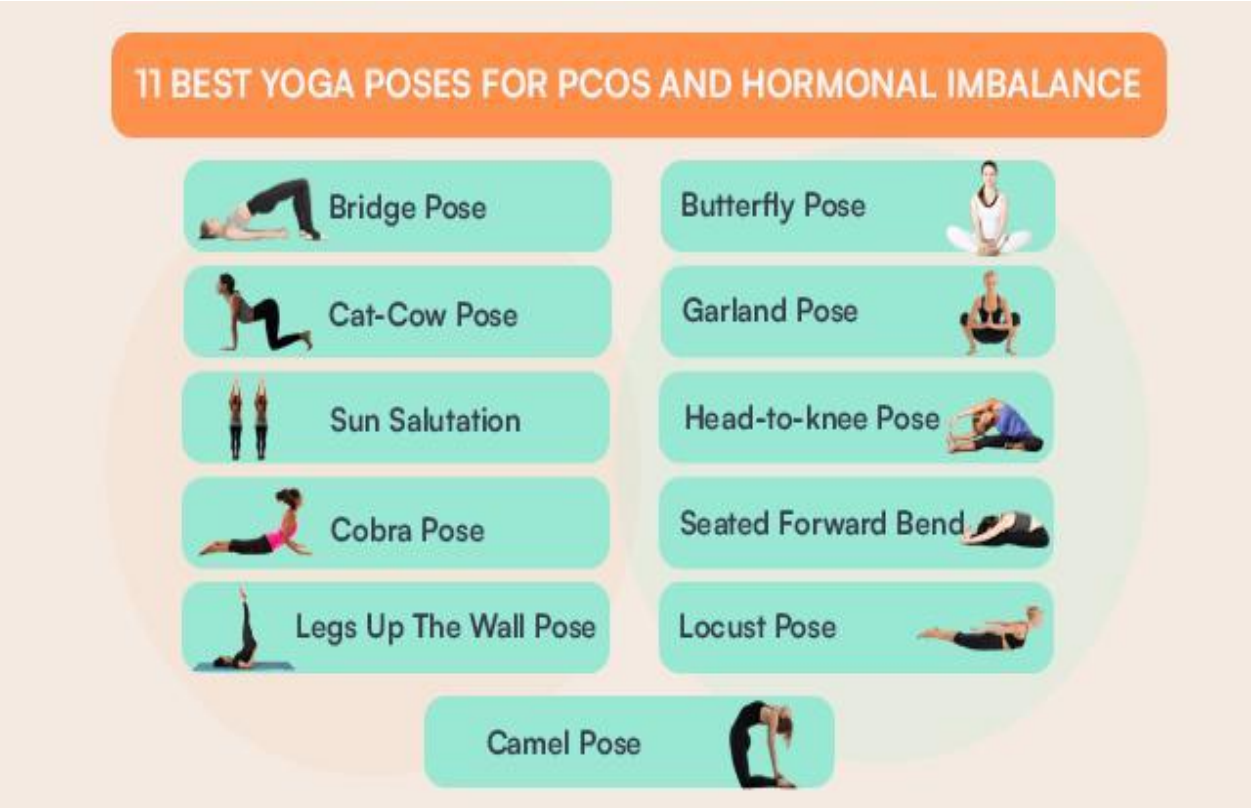

Figure: 1 Different Poses of Asana for PCOS and Hormonal Imbalance

Yoga and Thyroid disorders

Hypothyroidism is an endocrine disorder commonly found among women, marked by deficient production of thyroid hormones which consequently affects the body with symptoms such as fatigue, weight gain, depression and irregularity of menses. Yoga has been proved to help thyroid health by way of;

Enhanced blood circulation to the neck area and thyroid gland

Enhancing and restoring the metabolic rate via endocrine stimulation

Reducing the stress factors which have an indirect relation to thyroid hormone balance.

Activating the parasympathetic nervous system that in turn helps in maintaining normal function of glandular system

Asana like Sarvangasana, Matsyasana, Halasana are traditionally known to be stimulation of the thyroid gland. Yoga also improves the quality of life and reduced the symptoms of fatigue and mood fluctuations in hypothyroid patients (Rao et al., 2014).

Figure: 2 Different Poses of Asana for Thyroid

Yoga and Menstrual Disorders

Menstrual disorders include irregular menstruation, painful menstruation (dysmenorrhea), and absence of menstruation (amenorrhea). These conditions are often linked to hormonal imbalance, stress, and poor lifestyle habits.

Yoga helps in:

- Regulating estrogen and progesterone balance
- Reducing pelvic pain and muscle tension
- Improving uterine blood flow
- Normalizing menstrual cycle patterns
- Reducing stress and emotional disturbances

Studies show that yoga-based interventions significantly reduce severity of menstrual pain and improve cycle regularity in adolescent girls and women (Rakhshaee, 2011).

Figure: 3 Different Poses of Asana for Period pain

Yoga and Menopausal Hormonal Changes

During menopause, estrogen levels decline, leading to symptoms such as hot flashes, mood swings, sleep disturbances, and osteoporosis risk.

Yoga helps manage menopausal symptoms by:

- Reducing vasomotor symptoms (hot flashes, sweating)
- Improving sleep quality and reducing insomnia
- Enhancing mood stability and reducing irritability
- Supporting bone health through weight-bearing postures
- Balancing neuroendocrine function

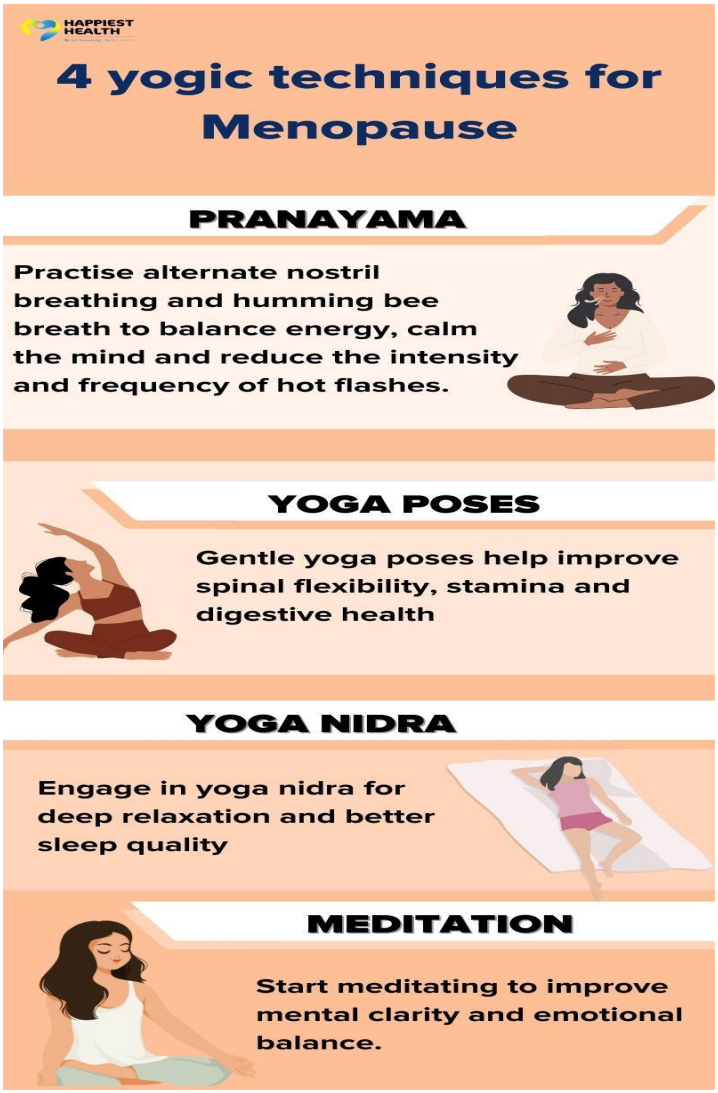

Figure: 4 Different Poses of Asana for and Menopause

Regular yoga practice improves overall quality of life and reduces psychological distress in menopausal women (Sengupta, 2012).

Effects of Yoga on Metabolic and Reproductive Hormones

Yoga has demonstrated positive impacts on the management of hormonal regulation of metabolism and reproduction, particularly in conditions like Polycystic Ovary Syndrome. Regular practice of yoga can improve insulin sensitivity by reducing stress. Stress overstimulates the hypothalamic-pituitary-adrenal (HPA) axis, thus increasing cortisol secretion. Since higher cortisol levels correlate closely with insulin resistance, this can lead to higher glucose uptake by the cells, better metabolic efficiency and health and a lower risk of the metabolic syndrome.

Yoga is effective in managing the level of androgens, which tend to increase in conditions such as PCOS.

Hyperandrogenism manifests in several symptoms such as acne, hirsuitism and lack of ovulation. Through reduced stress and autonomic balance, yoga normalizes endocrine activity indirectly lowering the production of androgens from the ovaries and adrenal gland. Through a combined approach to reducing the levels of hormones, not only physical well being improves, but the mental health and the well being of women also benefits.

Yoga helps regulate the secretion of the menstrual cycle through normalization of the hypothalamic-pituitary-ovarian (HPO) axis. A better secretion of Gonadotropin releasing hormone (GnRH), Luteinizing hormone (LH) and Follicle stimulating hormone (FSH) favors correct growth of the follicle and normal ovulation. For these reasons, women who practice yoga on a regular basis tend to have an earlier onset of menstruation as well as more regular menses.

Yoga & Thyroid Function

Yoga is known to positively impact thyroid health and is effective in various conditions like Hypothyroidism. It is employed as an adjunct therapy in managing the regulatory processes of endocrine functions by improving neuroendocrine balance, stress response and enhancing metabolic functions.

Stimulates thyroid functions

It is thought that yoga may influence thyroid functions through a direct improvement in the vascular flow within the neck region as well as an enhanced autonomic system. Specific yoga poses like Sarvangasana, Halasana, and Matsyasana increase the blood flow to the thyroid gland thereby supporting thyroid function. Pranayama and meditation help regulate the cortisol output, an increased level of which may suppress thyroid function. It aids in the management of the Hypothalamic-pituitary-thyroid (HPT) axis regulation.

Helps in Hypothyroidism Management

In cases of Hypothyroidism, characterized by deficient secretion of thyroid hormone levels, yoga aids in symptom relief and improving overall quality of life. With yoga practice, one notices improvement in various hypothyroid symptoms such as fatigue, weight gain, lethargy and depression. Yoga improves metabolic rate and increases the energy level of the body; hence it aids in the mental as well as physical state. Yoga also helps in the management of sleep disorders which are prevalent among Hypothyroid patients and also stress, thereby regulating endocrine functions. Although not a replacement for conventional therapy, yoga acts as a complementary method of treating hypothyroid symptoms through improved endocrine, mental, and physical health.

Yoga & Menstrual Health

Yoga is beneficial in the management of women's menstrual health by regulating hormonal output, controlling stress and increasing the pelvic circulation. It is beneficial in cases of Primary Dysmenorrhea as well as irregular menses through an impact on the neuroendocrine and autonomic nervous system.

Reduces dysmenorrhea

The yoga exercises helps relief the pain of dysmenorrhea by loosening and stretching the pelvic muscles, reducing uterine contractions and increasing blood circulation in the pelvic region. Poses such as Bhujangasana, Supta Baddha Konasana, and Pavanamuktasana helps relieve the abdominal bloating, pain and menstrual cramps. Breathing exercises like pranayama further reduces the level of stress hormones in the body which are directly related to prostaglandin activity, thus lowering the intensity of menstrual pain.

Improves cycle regularity

Yoga is also seen to positively impact menstrual cycle regularity by aiding the proper regulation of hormones in the Hypothalamic-pituitary-ovarian (HPO) axis. Stress, when not managed, affects ovulation time leading to irregularities in menses. Regular yoga practice can significantly reduce cortisol levels in the body that can interfere with the regulation of ovulation time. It helps in managing hormone fluctuations and supports proper ovulation time in women, which directly affects the menstrual cycle regularity.

Yoga & Menopause

Yoga is effective as an alternative or supportive therapy for menopausal symptom management by way of regulation of neuroendocrine functions, improvement in stress levels and a rise in the quality of life. It helps in managing menopausal symptoms like vasomotor, psychogenic and sleep-related disorders for women going through Menopause.

Reduces hot flashes

Hot flashes are one of the cardinal symptoms during menopause, usually caused by variations in estrogen level and its effects on the thermoregulation system in the hypothalamus. With regular yoga practice, hot flashes can reduce significantly by promoting an equilibrium of the autonomic nervous system and a better hormonal balance due to lower stress hormones. With enhanced parasympathetic activity the temperature regulation system is also influenced for good.

Improves mood and sleep

The effects of yoga also include enhancement in sleep quality and emotional stability for women suffering from the psychological symptoms of menopause such as anxiety, irritability, and depression and insomnia. Yoga and meditation enhances the neurotransmitter release like Serotonin and Gamma-aminobutyric acid (GABA) which are responsible for better mood, stress management and emotional regulation. Such practices promote deep sleep and reduction in insomnia symptoms in women during menopause.

Yoga & Stress hormones

Yoga has a profound impact on the regulation of neuroendocrine functions in the body and is well known for its ability to decrease stress and enhance the feeling of well being. Yoga effects the functioning of stress hormones primarily through modulation of the hypothalamic-pituitary-adrenal (HPA) axis and autonomic nervous system.

Reduces cortisol levels

Cortisol levels are usually high in people under chronic stress and this leads to increase in anxiety levels, metabolic disruption and hormonal imbalances. Regular practice of yoga, especially pranayama, meditation and relaxation poses, leads to reduced HPA activity and an increase in cortisol output, thus restoring balance. An improved cortisol profile indicates better health in general and aids in improving the hormonal balance of the body and immunity levels.

Improves serotonin and dopamine levels

Yoga not only decreases levels of stress hormones but it is also effective in increasing level of neurotransmitters such as Serotonin and Dopamine, which affect mood, stress and well being. Breathing exercises increase the parasympathetic outflow from the autonomic nervous system to regulate emotions and induce positive state of mind, thereby promoting feelings of peace and blissfulness.

Helps in managing depression

Due to its multiple physiological and psychological effects, yoga is beneficial in controlling symptoms of depression. Yoga leads to a decrease in stress hormones, an increase in mood boosting neurotransmitters such as serotonin and dopamine, hence improving emotional balance. Additionally, yoga promotes mindfulness, improves mental focus and significantly boosts sleep quality, reducing the chances of people developing depressive disorders.Yoga Asanas for Hormonal Balance in Women

Yoga helps regulate the hypothalamic–pituitary–ovarian (HPO) axis, improves endocrine gland function, and reduces stress-related hormonal imbalance.

1. Setu Bandhasana (Bridge Pose)

Setu Bandhasana

- Stimulates thyroid and reproductive glands
- Improves estrogen balance
- Reduces stress and fatigue
- Helpful in PCOS and hypothyroidism

2. Bhujangasana (Cobra Pose)

Bhujangasana

- Activates ovarian and adrenal function
- Improves menstrual regularity
- Reduces abdominal tension

3. Dhanurasana (Bow Pose)

Dhanurasana

- Strengthens reproductive organs
- Improves blood circulation to pelvic region
- Helps regulate menstrual cycle

4. Supta Baddha Konasana (Reclining Butterfly Pose)

Supta Baddha Konasana

- Balances hormones naturally
- Relieves menstrual discomfort
- Reduces stress and anxiety

5. Malasana (Garland Pose)

Malasana

- Improves pelvic blood flow
- Supports ovarian function
- Helpful in PCOS and irregular periods

6. Sarvangasana (Shoulder Stand)

Sarvangasana

- Stimulates thyroid gland
- Balances endocrine system
- Improves overall hormonal regulation

7. Anulom Vilom Pranayama

Anulom Vilom

- Balances HPO axis
- Reduces stress-induced hormonal imbalance
- Improves menstrual regularity

8. Bhramari Pranayama

Bhramari Pranayama

- Calms nervous system
- Improves endocrine stability
- Reduces anxiety-related hormonal disturbance

Conclusion

Yoga is a holistic mind–body intervention that plays a significant role in maintaining and restoring hormonal balance in women through its influence on the neuroendocrine system, particularly the hypothalamic–pituitary–ovarian (HPO), hypothalamic–pituitary–thyroid (HPT), and hypothalamic–pituitary–adrenal (HPA) axes. The evidence reviewed suggests that regular yoga practice helps regulate key hormones by reducing stress-induced cortisol levels, improving autonomic nervous system balance, and enhancing neurotransmitter activity such as serotonin and dopamine.

In conditions such as Polycystic Ovary Syndrome, yoga improves insulin sensitivity, reduces androgen levels, and helps in the restoration of menstrual regularity. In Hypothyroidism, yoga contributes to symptom management by improving metabolism, reducing fatigue, and supporting overall endocrine balance. Yoga is also beneficial in menstrual disorders by reducing dysmenorrhea and improving cycle regularity, while in menopause it helps alleviate hot flashes, mood disturbances, and sleep problems. Additionally, yoga significantly improves mental health by reducing cortisol and enhancing emotional stability, thereby lowering the risk of stress-related hormonal disturbances and depression.

Overall, yoga should be considered an effective complementary therapy rather than a replacement for medical treatment. Its regular practice promotes physical, psychological, and hormonal well-being, making it a valuable non-pharmacological approach for improving women's reproductive and endocrine health. However, further large-scale clinical studies are required to strengthen the evidence base and establish standardized yoga protocols for specific hormonal disorders.

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