

PRANAYAMA - AN EFFECTIVE PATH FOR MANAGEMEMNT OF POLY-CYSTIC OVARIAN SYNDROME

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ABSTRACT

Polycystic ovary syndrome (PCOS) is the most common endocrine disorder in women of reproductive age group, affecting 5 – 10 percent of women. (PCOS) is a condition which can affect a woman's menstrual cycle, fertility, hormones and aspects of her appearance. Stress and modern day unhealthy life style are contributing as an important reason behind PCOS. Although it is impossible to eliminate stress completely from our day-to-day life, we can surely build up our capacity to deal with it. In *Yoga Nadis* are the subtle channels for transmission of nerve impulses, blood or lymph, conduction of *Pranic* flow of *Vayu* through them. When *prana* becomes unbalanced, due to mental and physical stress, the *Nadis* become blocked, which can lead to illness and disease like PCOS. *Pranayama* like *Bhastrika* and *Bhramari* will cleanse and purify the *Nadis*, which will allow for a smoother flow of "*Prana*," throughout the body, mind, and spirit.

Keywords: *Bhastrika, Bhramari Nadis, PCOS, Pranayama, Yoga.*

INTRODUCTION

Polycystic ovarian syndrome is common occurrence today in women at reproductive age. It is suggested by the National Institutes of Health research that, at least 5-10% of the young women are diagnosed with this condition.^[1] Women with this syndrome do not ovulate regularly and have ovaries that contain multiple small cystic structures usually about 2-9 mm in diameter.^[2]

Most doctors believe it to be a result of stress, a fall out of modern-day unhealthy life style. As Dr. Pratima Malik, Gynaecologist, Apollo Hospitals, states, "The highly ambitious, stressed-out working woman of today is likely to be more prone to PCOS".^[3] *Yoga* helps release deeply

stored stress in the system, which can help improve PCOS symptoms.

According to *Maharshi Patanjali Yoga is Chittvrittinirodha*.^[4] And to obtain control over these *Chittavritti*, *Maharshi Patanjali* has suggested the path of *Ashtanga Yoga* in which *Pranayama* constitutes forth step.^[5] *Prana* means a subtle life force, which provides energy to different organs including mind and also controls many vital life processes. *Ayama* signifies the voluntary effort to control and direct this *Prana*.^[6]

In *Yoga Nadis* are the subtle channels or the passages for the transmission of nerve impulse, circulation of the blood or lymph or conduction of the *Prana* ("life

force energy"). When *Prana* becomes unbalanced, due to mental and physical stress, the *Nadis* become blocked, which can lead to illness and disease.^[7]

Thus in PCOS hormonal imbalance occurs due to the stressful situations which can be well treated with *Pranayama*. The *Pranayam Bhramari and Bhastrika* can be effective in this condition. *Bhramari* will help in calming down the mind and *Bhrastrika* will help in purification of *Nadis*.

AIMS AND OBJECTIVE

Aim of this study is to explain mechanisms of action of *Pranayama* i.e. *Bhastrika* and *Bhramari* in PCOS.

MATERIALS AND METHODS

Search was conducted using search terms '*Yoga or Pranayama and PCOD or infertility title or abstract in National Library of Medicine MEDLINE (www.pubmed.com) website.*

Published literature concerning mechanisms of action of *Yoga or Pranayama* in PCOS emphasizing psycho-endocrine relations was retrieved from Pubmed and Pubmed Central and analyzed.

PCOS (Polycystic ovarian syndrome)

PCOS is heterogeneous disorder which is characterized by excessive androgen production by the ovaries, which interferes with the reproductive, endocrine and metabolic functions.^[8]

Symptoms:

Irregular Menstrual cycle, ovarian cyst, acne, hair loss, baldness similar to male, abdominal bloating, dandruff, frequent mood swings, miscarriage, irritability, hair growth on the face and rest of the body, increase in weight, muscles and bone enlargement, blood sugar imbalance.

Patho-physiology of PCOS

PCOS can be correlated with stress mechanisms. Any stressful situation affects balance between sympathetic and para-

sympathetic systems by activation of Hypothalamo-Pituitary-adrenal Axis (HPA) which results in secretion of Corticotrophin-Releasing Factor (CRF) from hypothalamus. CRF stimulates the secretion of ACTH from pituitary, which further activates the adrenal glands (adrenal cortex) to produce glucocorticoids (cortisol). Also stressful situation activates sympathetic nervous system which stimulates adrenal medulla to release catecholamine i.e. adrenalin, nor-adrenalin, serotonin, dopamine.

In case of chronic and excessive stressful stimuli, cortisol leads to enhanced glycogenolysis and gluconeogenesis which ultimately lead to elevation of blood sugar concentration. Sustained hyperglycemia impairs insulin-stimulated glucose utilization and glycogen synthesis in skeletal muscles, which ultimately leads to insulin resistance. Beta cells in the pancreas subsequently increase their production of insulin, further contributing to a high blood insulin level. High levels of circulating insulin are thought to contribute both to excess androgen production and to anovulation. Persistent anovulation have higher mean concentration of leutinising hormone (LH), but low normal levels of follicle stimulating hormone (FSH) in ratio 3:1 respectively. The elevated LH levels are partly due to increased sensitivity of pituitary to gonadotropic releasing hormone stimulation. Because of the FSH levels are not totally depressed, new follicular growth are continuously stimulated, but not to the point of full maturation and ovulation and they are in the form of multiple follicular cysts 2 to 10 mm in diameter.^[9] Insulin resistance also leads to increase in trunk-abdominal fat mass which again leads to abnormal glucose tolerance raising the sugar and insulin in blood. This hyperinsulinemia acts on liver and reduces SHBG (sex hormone binding globulin)

also increases IGF-1 (Insulin like growth factor 1). Reduction of SHBG increases the testosterone in blood, whereas the increased IGF-1 will cause hyperplasia of theca cell of ovary and increased androgens in blood.^[10]

Gonadotropin releasing hormone (GnRH) is secreted from hypothalamus to release gonadotropins (FSH and LH). The secretion and release of GnRH is in pulsatile manner. The neurohormonal control of GnRH secretion is modulated by neurotransmitter like norepinephrin exerts a stimulatory effect on the release of GnRH, while dopamine and serotonin exerts its inhibitory effect. Catecholamines are capable of changing the frequency of GnRH pulse. Thus pharmacological agents, psychological factors which affect the brain catacholamines, are likely to affect the pulsatile release of GnRH.^[11]

Thus overproduction of CRH and other stress-related hormones in the brain and activation of the pituitary-adrenocortical system by chronic stress seem to play causative roles in the inhibition of gonadotropin secretion and leads to PCOS.^[12]

Concept of Nadis in YOGA

According to *GorakshaSamhita* there are 72,000 *nadis* while *Shiva Shiva Samhita* has mentioned up to 3,50,000 *nadis*.^[13] The word *Nadis* is used for any big or small organ which functions as a longer or shorter passage for the transportation of food drink, blood, lymph, air or a nervous impulse.^[14] The *Hatha Yoga Pradipika* says that when the *nadis* are purified, the body becomes thin and glows, the digestive power increases, the inner sound or *nada* awakens and one becomes free from disease.^[15] These *Nadis* have the power of carrying impulses or known as *Pranava-haka*.^[16]

When a person knowingly or unknowingly misuses the body-mind apparatus for a considerable period of time, the three *Doshas* or humours, *Kapha*, *Vata* and *Pitta*, become imbalanced, blocking the free flow of *Prana* in the *Nadis*. In PCOS blockages in the *Nadis* may result from;

- Lack of adequate physical movement
- Pooling of *Prana* in one area depriving the other areas, e.g. in occupations demanding intense and prolonged mental activity or only a set pattern of movement or posture
- Harmful diet and products of digestion, e.g. acidic diet
- Excessive accumulation of metabolic waste products
- Unbalanced and unharmonious lifestyle, leading to the accumulation of toxic products e.g. inadequate sleep, excessive or wrongly timed mental or sexual activities, failure to adapt to the rhythms of nature.

DISCUSSION

Probable mechanism of Pranayama in the management of PCOS

Pranayama occupies second place in *Hatathyoga* while it constitute fourth step of *Patanjali's Ashtanga yoga*. The word *Pranayama* is formed by two words i.e. *Prana* and *Ayama*. *Prana* means a subtle life force, which provides energy to different organs and also controls many vital life processes. *Ayama* signifies the voluntary effort to control and direct this *Prana*. Breathing is one of the vital activities governed by *prana* on a gross level. This is the only *Pranic* activity available to us, which can be regulated voluntarily. *Pranic* activity is linked with the nervous system on one hand and mind on the other. Thus mind could be controlled effectively with the voluntary regulation over breathing. Using this advantage the *Pranayama* like

Bhramari and *Bhastrika* will help in the management of stress by relieving the obstructions between *Nadis* and can prevent PCOS.

Bhastrikapranayama

Meaning of *Bhastrika* is bellows of the blacksmith. Like bellows, *Puraka* i.e. inhalation of breath and *Rechaka* i.e. exhalation of breath are done rapidly. Act of exhalation is more forceful and quick, compared to inhalation, which is slow and less forceful. *Puraka* and *Rechaka* are performed again and again quickly and with force.^[17]

Mode of action:

Bhastrika Pranayama is revitalizing *Pranayama*, which increases oxygen levels and reduces carbon dioxide levels in the blood by the act of quick inhalation and exhalation. Due to this the blood circulation of the internal organs improves and hence they function better.

In *Bhastrika Pranayama*, the abdominal muscles and diaphragm are used which puts pressure on the internal organs. In PCOS there is excess of accumulation of adipose tissue in abdominal region due to insulin resistance. *Bhastrika pranayama* helps in raising metabolic function at the cellular level to increase the burning of fat and promoting healthy, natural weight loss. Further it will help in relieving insulin resistance.

By practicing *Bhastrika pranayama* all the three *doshas* (*vata*, *Pitta* and *Kapha*) are maintained in balanced state.^[18] Excessive fat and mucus disappear, indicating balance in *Kapha*, stability and firmness in the body and mind become noticeable with balance in *Vata*, and the internal organs, especially the digestive system and the intellect, start functioning efficiently when *Pitta* is balanced. In this way the practice of *Bhastrika pranayama* will help to clear the accumulated *Pranic*

blockages by purifying the *Nadis* by removing the accumulated *Doshas*.

The most important physiological effect of *Bhastrika* is on the brain & heart. It stimulates the circulation of cerebral fluid & increases the compression and decompression upon brain, creating a rhythmic massage. The rhythmic pumping of diaphragm & lungs stimulates the heart & blood circulation. Accelerated blood circulation and rate of gas exchange in each cell, produces heat and washout the waste gases. Thus it helps in normalizing the function of brain and makes it more attentive. Due to this the function of brain i.e., detection of stimulus, power of discrimination, decision making, memory and reaction time, all which were affected due to stress in case of PCOS, gets normalized.

Bhramri Pranayama:

While practicing *Pooraka* and *Rechaka* in *Bhramari Pranayama*, low but reverberating and pleasant humming sounds are produced similar to those made by the male bee and female bee respectively. It is also called as *Chidanandakari Pranayama* in Hatha Yoga. It is mentioned that *Yogis* do this *Pranayama* for longer duration to get ecstatic state of mind.^[19]

Mode of action;

In *Bhramari Pranayama*, sound of male and female bee is produced due to which its vibration increases the serenity of mind and prepares it for merging with subject. These sounds produce sweet and melodious vibrations and resonance which have a soothing effect on the nerves and the mind. So it is the practice to arrest the fickleness and modulation of mind.^[20]

Bhramari relieves stress and cerebral tension alleviating anger, anxiety and insomnia, and reducing blood pressure. It strengthens and improves the voice and eliminates throat ailments. This may have posi-

tive effect on the endocrine glands specially thyroids and nervous system.

Bhramari Pranayama acts by bringing balance to both the autonomic nervous system and the HPA axis. It acts via down-regulating the HPA axis which gets hyper-activated as a response to abnormal physical or psychological demand. It has a calming effect on entire nervous system; especially it stimulates the parasympathetic nervous system, which induces muscular relaxation. It reduces secretions of cortisol and catecholamines through parasympathetic activation and associated anti stress mechanisms. It reduces perceived stress and HPA axis activation, thereby improving overall metabolic and psychological profiles, increasing insulin sensitivity, and improving glucose tolerance and lipid metabolism.

Bhramari Pranayama will helps in optimizing insulin secretion as per bodily requirement through its neuro - endocrinal effects and thereby bringing about normalcy in the Insulin/Glucose ratio which is suggestive of better peripheral utilization of Insulin and reduced insulin resistance.

Due to balance in HPA axis, the pulsatile secretion of GnRH also improves thus it stimulates anterior pituitary to release LH and FSH whenever required in proper quantity. It balances hormones by reducing the androgens and encouraging egg production.

CONCLUSION

Yoga provides convincing evidence for its effectiveness over autonomic nervous system. *Pranayama* is the science of harnessing the breath for gaining control over Prana and thereby, on mind. It helps in purifying the *Nadis* i.e. subtle channels of *Prana*. *Bhastrika pranayama* will help in purifying the *Nadis* thus remove obstructions in the flow of hormones and balances its functions. *Bhramari pranayama* will

work over brain and produce calming effect on entire nervous system, especially it stimulates the parasympathetic nervous system, which induces muscular relaxation and thus relaxes the body and mind. So it will help in balancing the autonomic nervous system and HPA axis. Hence both the *Pranayama* play a very effective role in management of PCOS by managing stress factor.

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