



Review Article

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A REVIEW ON LIFE STYLE MODIFICATION: THE MAINSTAY IN POLYCYSTIC OVARIAN SYNDROME

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Received on: 27/02/18 Accepted on: 05/04/18

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DOI: 10.7897/2277-4343.09352

ABSTRACT

Polycystic Ovary Syndrome - A metabolic malady the mother of all lifestyle disorders affecting mainly the women of childbearing age and teenage girls. India being the diabetic capital of world has close relation to PCOS metabolic syndrome comprising various frightening complications like overt diabetes, dyslipidemia, hypertension, endometrial cancer etc. According to W.H.O., PCOS affects 8 to 20 percent of women worldwide. In India, Department of Endocrinology and Metabolism AIIMS conducted a study which shows that about 20 to 25 percent of Indian women of reproductive age are suffering with PCOS. The etiology of this disease is now found to be both genetic and environmental. Obesity and insulin resistance is important target for preventive and therapeutic interventions. Therefore, life style modifications through diet and physical activity (Yoga therapy, meditation, pranayama, bio-purification procedures) are main stay of management. Healthy dietary interventions in the form of limited calories intake, avoidance of high carbohydrate diet, restricted fat intake, high fibrous diet, proper meal spacing and avoidance of junk food are very essential interventions to combat the weight gain. Physical activity in the form of yoga, brisk walking is essential modifiable life style component in its management. Studies have proved that 5 to 10 percent weight loss is enough to restore normal menstrual pattern and ovulation. Pranayama and meditation calms the mind which leads decrease level of depression, anxiety, stress level and self-esteem. Adopting all these interventions we can improve quality of life and can have better metabolic and reproductive outcome in women suffering from PCOS.

Keywords: PCOS, Wholesome food, Anovulation, Yoga, Breathing techniques.

INTRODUCTION

Women is the supreme creation of God, architect of society so women health need to be front and center but in present scenario our metaphysical society is facing hectic stressed unsteady life style and handout of this life style is emerging in the form of newer diseases. PCOS a metabolic malady mother of all life style disorders has also emerged as major public health challenge, it is the most common endocrinopathy affecting mainly the women of child bearing age and teenage girls. W.H.O. estimates that PCOS has affected 116 million women (3.4 percent) worldwide in 2012.¹ Globally prevalence rate of PCOS is highly variable ranging from 20.2 percent to as high as 26 percent, in India researchers claim 10 percent of the women are affected by the PCOS. In a study conducted by Nidhi, R et al. prevalence of PCOS in Indian adolescence is 9.13 percent.² According to a study conducted in U.S. 11 percent women of reproductive age group are afflicted by PCOS but in adolescents it may be as high as 50 percent.³ In recent years India has witnessed 30 percent rise in incidence of PCOS in young adults due to changes in life style so one thing is sure that incidence is on the rise. In India the high incidence is due to unhealthy life style habits like eating fast food, lack of physical activity. Various socioeconomic studies in India have observed PCOS as life style disorder highly prevalent in middle and high income urban population. A research study conducted by R.V. Bharti has reported that prevalence of PCOS in rural population is less as compare to urban areas.⁴ PCOS is the most common metabolic disorder with reproductive and metabolic consequences. It is characterized by anovulation menstrual irregularities infertility and hirsutism, the manifestations of PCOS are not only confined to reproductive sphere but also shows that an increased prevalence of several

comorbidities like obesity, dyslipidemia, hypertension, type 2 diabetes mellitus, metabolic syndrome and greater risk of developing cardiovascular disorders and endometrial carcinoma.⁵ Although hyperandrogenism and infertility are distressing to young women but its long term metabolic sequel eventually plague the individual in terms of morbidity and mortality. India being the diabetic capital of world has close relation to PCOS-MS (metabolic Syndrome). In a study conducted Andra D. Coviello et al. found that adolescent girls with PCOS have higher prevalence of metabolic syndrome than general adolescent girls with 3.8 times increased risk.⁶ Women with PCOS tend to go to overt diabetes about a decade earlier than their healthy counter parts. Infertility is also one of the most terrifying reproductive sequels of PCOS affecting 48.5 million women worldwide and out of this PCOS accounts for 6 to 15 percent of cases.⁷ Etiology of this disease is found to be both genetic and environmental. The increase incidence of PCOS is attributed to change in dietary habits in most part of world because of noticeable shift from eating fresh home cooked food to ready to eat processed food on daily bases which lacks adequate nutritional value and dietary fibers. Adding to the woes, there is increased use of preservatives and flavoring agents in food disrupts are endocrine system and lead to these catastrophes. Nowadays obesity and insulin resistance are strongly implicated in its etiology. Approximately 60 percent of women with PCOS are obese and 60 to 70 percent have insulin resistance and both are enough to wreak complete havoc on the body. In present times obesity has reached epidemic proportions with worldwide prevalence of 35 percent in females⁸ despite of close association between insulin resistance and obesity; obesity is powerful magnifying factor of several aspects of PCOS, so reproductive and metabolic consequences are more severe in obese women. Researches have reported that obesity

have negative impact on dynamics of ovulatory hormones, quality of oocyte and thickness of endometrium therefore reduces fertility.⁹ Some studies have concluded that increase in weight leads to decrease in probability of conception per cycle.¹⁰ Obese women are three times more likely to suffer infertility than women with normal BMI¹¹ so weight reduction is main stay of management in PCOS by adopting some non-pharmacological life style modifying interventions including diet and physical activity in contemporary science although there are lots of treatment modalities but associated with substantial cost and pauses great financial burden. So researchers are paving way in Indian traditional system of medicine because Ayurveda mainly emphasis on holistic and scientific approach based upon Dietary regime (Aahar) and Life style (Vihar) more than Medicines (Aushadha). In 2008, European society of Human Reproduction and Embryology (ESHRE) and American Society for Reproduction Medicine (ASRM) published a consensus suggesting lifestyle changes as first line of treatment for women with PCOS.¹² Since, then the benefits of lifestyle changes resulting from PCOS therapy have been well documented considering the pivotal role of weight reduction in management of PCOS, researcher have reported that even a small weight reduction and decrease in total body fat percentage by 5 to 10 percent improves hormonal profile and is sufficient to restore ovulation in anovulatory obese women.¹³ Therefore, a much need of formulating certain life style guidelines for public education and awareness on PCOS is required for general health of women in the country. Here an effort has been made to establish a holistic approach for management of PCOS.

LIFE STYLE MODIFICATIONS

It consists of multifaceted approach of dietary, exercise and behavioral therapies which aim to educate an individual to achieve optimum reproductive ovulatory outcome.

DIETRY REGIME

“A judicious choice of food can counteract toxic substances”. Diet plays a vital role in maintenance of good health, prevention and cure of diseases. In Ayurveda food has been compared to vital force (Prana).¹⁴ Acharya Charak has quoted wholesome food (Pathya) is one of the cause of growth and wellbeing of individual whereas unwholesome food (Apathya) is root of all diseases.¹⁵ In Ayurveda text it is quoted that “If wholesome is followed medicine is not needed and if wholesome is not followed even medicines are not useful”.¹⁶ Strong focus should be lead on contribution of dietary regime.

Dietary Recommendations

Food to Include (Pathya Ahara)

- Consume whole grains, low glycemic index food grains (Ruksha ana), low calorie high satiety food (Guru Aptarapan Ahar)¹⁷ mentioned in awned grains (Shookdhanya Varga) like Barley (Yavak), Barnyard Millet (Shyamak), Job’s tear (Gavedhuk), Kodo millet (kodrav), *Triticum sativum* (Godhum). These awned grains contain less carbohydrate and more dietary fibers which help to maintain weight of individual. As per a study conducted by C.L. Harrison et al., more specialized low carbohydrate ketogenic diet has been reported to significantly reduce weight, LH/FSH ratio, testosterone, fasting insulin and insulin resistance.¹⁸
- Consume protein rich diet mentioned in Ayurveda texts as legumes (Shimbi Dhayanak Varga) like Green gram (Mudag), Lentils (Mangalyak), Split pigeon peas (Adaki), Brown Chickpeas (Chanak), Horse gram (Kulath), Black

gram (Masha) having high protein content. Researches has also reported that patients having high protein diet showed considerable decrease in insulin resistance, improvement in menstrual cycle regularity, improved lipid profile and decrease in weight.¹⁹

- Consume seeds like Sesame seeds (Tila), Flax seeds (Atsi), Sunflower seeds, Pumpkin seeds these are rich in mono unsaturated fatty acids, oleic acid and high-quality vitamins and minerals. These acts as antioxidant and lowers blood cholesterol level. Sesame seeds (Tila) having low glycemic index are potent antioxidant rich in vitamins, minerals like copper and manganese.²⁰ New researches establish the role of copper and manganese as health supplements in management of PCOS.
- Flax seeds are helpful in maintaining hormonal profile in PCOS by reducing androgen level in the body.²¹
- Acharya Susruta has quoted the use of Fish meat (Matasya Masa) in hypomenorrhoea (Artava kshaya)²² which is main symptom of PCOS. Fish is rich source of omega 3 fatty acids and according to study omega 3 fatty acids reduce serum concentration of testosterone, regulate menstrual cycle, improve insulin sensitivity and prevent CVS disorders by lowering blood cholesterol level.²³
- Acharya Bhav Prakash has mentioned the use of citrus fruits (Amal Phala) and green leafy vegetables (Shaak) in hypomenorrhoea (Artava Kshya).²⁴ Citrus fruits has low glycemic index, rich in dietary fiber content, rich in vitamin C leading to slow consistent controlled rise of blood sugar and insulin level. Whole fruit should be consumed instead of simple juice to prevent spiky rise of insulin. A study has established that low glycemic index diet raises blood sugar level slowly and prevents insulin spikes.²⁵ Fruits like Pomegranate (Dadim), phalgu, Lemon (Matulung), Jackle jujube (Karkandu), Gooseberry (Amalak), Apple, Orange, Peaches, Plum, Raspberry, Strawberry, Cranberry, Blackberry, Kiwi, Pear, Watermelon and Papaya. Green leaves like *Cissampelos pariera* (Patha), Green Pea (Sateen), *Chenopodium album* (Vastuk), *Oxalis corniculata* (Changeri), Garlic (Lahsun), Broccoli, Carrot, Cauliflower, Cucumber, Green beans, Spinach, Tomato, Asparagus (Musli).
- Consume honey (Madhu) and aged alcoholic beverages mentioned in Ayurveda text like cereal based beverages (Sura), Vinegar (Sukta) which alleviates Vata Kapha considered to be the cause of PCOS.
- Use *Piper longum* (Pippali), Asafetida (Hingu), Himalayan Rock salt (Saindhav), Cumin seeds (Ajaji), *Trachyspermum ammi* (Yavani) as spices in food preparations as these substances have potency to correct the Ayurveda pathogenesis of PCOS i.e. Agney Vatakaphahar property, thus alleviates vata and kapha dosha thereby maintaining doshik equilibrium in the body.
- Consume Butter milk (Takra) having astringent (Kashay Rasa, Vata Kaphar) property so helps reducing body weight.
- Consumption of Triphala powder (Ayurveda formulation) with honey helps to maintain the body weight.
- Choose healthy cooking options such as baking, grilling, boiling and steaming instead of deep frying.
- Recent studies have demonstrated the role of new health supplement myoinositol in improving fertility by enhancing insulin sensitivity.²⁶ Its natural sources are citrus fruits, beans nuts, legumes, sprouts and grains like oats and bran.²⁷

Foods to Avoid

- Acharya Charak has advised to avoid Milk and Dairy products (Gorasa)²⁸ in over saturation diseases (Santarponath

Vyadi) as these increases androgen level e.g. various milk products (Kilat, takrapinda, kuchika, Moratta), Cheese, yogurt, butter.

- Avoid use of excessive unctuous, sweet heavy substances as these consist of unhealthy Transfats e.g. fried foods like unleavened deep-fried bread (Poori), Fritter (Pakoda).
- Avoid jaggery (Goundik)²⁹ as these are sweets with high glycemic index leading to spiky rise of glucose.
- Avoid processed food like bread, pasta, white rice, muffins, cakes, cookies, candies etc.
- Avoid canned juices especially sugarcane juice.
- Avoid carbonated drinks, fried snacks/chips.
- Cut down caffeine intake.
- Avoid junk food because metabolism of junk processed food leads to disturbed carbohydrate metabolism leading to formation of Advanced Glycation End Products (AGE) which are cytotoxic and damage ovarian cell so altering their functional aspects.³⁰

Modifications in Eating Pattern

Along with description of wholesome and unwholesome food (Pathya Apathya Ahar) Ayurveda text has also given due consideration to eating pattern (Ahara Sevana Vidhi). "What, When and How to eat" is an important aspect in controlling PCOS.

- Matrashisyat³¹: One should eat in proper quantity.
- Jirneashniyat³¹: Eat only after full digestion of previously taken meal
- Veeryavirudhaashniyat³¹: Eat non – antagonistic food.
- Always eat easily digestible food in the evening.
- Eat at regular intervals: Taking high calorie heavy food in morning and low calorie small meals in evening helps in improving hormonal level, decreases insulin resistance and improves fertility outcome.³²

YOGIC INTERVENTIONS

Yoga is a psycho-somatic spiritual discipline for achieving union and harmony between our mind, body and soul by practicing specific techniques such as Yoga postures (Asanas), Breathing techniques (Pranayam) and Meditation (Dhyana) to attain highest level of consciousness. Documented scientific evidences strongly indicate that yoga has preventive as well as curative potential. Being a safe therapeutic modality, it can be used as an effective lifestyle adjunct to medical treatment to improve the quality of life in PCOS subjects.

Acharya Charak has greatly emphasized the importance of physical exercise (Vyayam) in oversaturation disease (Santarpanoth Vyadhi) and quote regular exercise (Vyayam nitya).³³ According to study conducted by C.L. Harrison et al. Physical activity has been reported to ameliorate anovulation, insulin resistance, hypertension and high lipid profile in women with PCOS.³⁴ Researches has also reported the effect of yoga program (consisting of Asanas, Pranayama and Dhayna) and conventional physical exercise on glucose metabolism and lipid profile in PCOS subjects after practicing it daily for 1hour for consecutive 12 weeks and found that yoga was more effective than conventional physical exercise in improving glucose, lipid, insulin sensitivity.³⁵

Yoga Poses (Yogasanas)

Yoga poses (Asanas) designed for PCOS help in opening up pelvic area and promote relaxations.

- Suryanamshkar (Sun salutation) - It is an ancient yogic method to worship sun and consists of series of postures (Asanas) with breathing pattern. It balances the whole endocrinal system by direct massaging of glands and increasing blood flow to organ thus regularizes the menstrual cycle.³⁶ Sun salutation significantly decreases blood sugar level, increases insulin sensitivity, improves lipid profile and results in weight reduction, improved BMI, low waist hip ratio.³⁷
- Suptbandhkonasana (Reclining Butterfly Pose) - Stimulates abdominal and pelvic organs like ovaries, urinary bladder, stretches inner thighs and groin which helps in relieving symptoms of stress and menstrual irregularities.³⁸
- Halasana (Plough pose) - It improves cardiovascular health and menstrual irregularities by reducing belly fat.
- Dhanurasana (Bow pose) - It is the best pose to reduce body fat and weight as it stretches the abdominal muscle to fullest of their strength.
- Bhujangasana (Cobra pose) - This asana exerts pressure over the abdomen and boosts the ovarian functions.
- Chakki chalanasa (Moving wheel pose) - It helps to modify the endocrine glandular functions thus enhances efficiency of hormonal secretions.
- Padmasana (Lotus pose) - This asana stretches the pelvis region.
- Naukasana (Boat pose) - This asana exerts pressure over the abdomen and corrects the functions of organs present in and around the pressurized area.

Probable mode of action of yoga poses (Asanas) can be explained by various researches and hypothesis. Yoga therapy focus on energy system present in the body with numerous chakras. Yoga poses like forward bending and backward bending increases second chakras energy flow called as seat of creation where reproductive organs are present. Yoga poses stretches abdominal region which increases blood flow towards reproductive organs and relieves any kind of tension around reproductive organs. By relieving stress yoga poses helps in improving ovulatory functions.³⁹ Yogic practices improves physical and mental health through regulation of hypothalamic pituitary adrenal axis, sympathetic nervous system and modulates neuroendocrine axis. Schmidt et al. found that following yoga therapy there is reduction in urinary excretion of adrenaline, noradrenaline, aldosterone, serum testosterone and LH levels indicating optimal changes in hormones.⁴⁰

Breathing Techniques (Pranayam)

Pranayama is control of breath. Prana is vital energy and Ayam means control. Regular practicing pranayama techniques increases life span and maintains health by controlling the process of breathing.

- Kapalbhathi Pranayam - Kapal means forehead and Bhati means shining. This breathing technique increases blood circulation to organs, corrects glandular secretion and combats oxidative stress. It reduces waist and hip circumference and reduces abdominal fat. This breathing technique regulates brain pancreas endocrine pathway correcting features of metabolic syndrome. Being abdominal respiratory exercise, it directly stimulates pancreas to release insulin and counteract hyperglycemia it also helps in self-healing of pancreatic cells thereby increases utilization of glucose in tissues.⁴¹
- Anulom vilom (Alternate nostril breathing) - This breathing technique purify the subtle energy channel (Nadis) thus

enabling smooth flow of vital energy (Prana). It calms the mind and body by relieving stress.

- Bhrumri - breathing technique to relieve mental tension, agitation and stress. Researchers have proved that practicing Bhrumri regulates normal functioning of endocrinal system.

Controlled breathing techniques tones up nervous system, improves emotional stability eliminate anxiety, improves self-esteem and increases insulin sensitivity.⁴²

Meditation (Dhyana)

Meditation is integral part of yogic practices which achieves harmonious balance between body and mind. This breathing technique relieves symptoms of PCOS by calming and soothing the mind. Meditation is a practice where an individual focuses

their mind on a particular object or activity to achieve mentally clear and emotionally calm state. A study reveals that transcendental meditation modulates physiological response to stress. It significantly reduces blood pressure and insulin resistance components of metabolic syndrome.⁴³

FULL DAY REGIME (NORTH INDIAN STYLE)

Full day diet plan is mentioned here as base plan. The patients of PCOS can choose any of the foods items mentioned earlier as wholesome food according to this particular syndrome. The variation of different physical exercises like going for brisk walk or other physical activity related to weight loss 2 to 3 times a week in place of yoga poses is also permissible with no space for irregular pattern or discontinuation of the regime. Table 1

Table 1: Basic diet plan (North Indian Style)

S. no.	Activity	Time	Diets and Physical Activity
1.	Rising early in the morning	6 a.m.	1 cup Green tea / Ginger honey tea / Cucumber / lemon juice / Amla juice / Asparagus with 3 to 4 Nuts / 1tsp of soaked Flax seeds / Sesame seeds
2.	Physical workout	6:30 a.m.	Sun Salutation 15 to 20 rounds. Pranayam 15 min. - Kapalbhathi, Anulom Vilom Meditation 5 - 10 min.
3.	Breakfast	8 a.m.	1 - 2 Barley / Millet Roti, 1 bowl green vegetables / vegetable oats / Upama with 200 g of seasonal fruits.
4.	Midmorning	11 a.m.	100 g of citrus fruits / Green salad.
5.	Lunch	1 p.m.	2 - 3 Multigrain Roti, 1 Bowl Rice, 1 Bowl Vegetable, 1 Bowl Pulses / 2 times a week shift to Fish and Chicken etc.
6.	Mid-Afternoon	4 p.m.	1 Glass Butter-milk or take 150 - 200 g of fruits like Apple / Orange / Peaches / Plum / Raspberry / Strawberry / Cranberry / Blackberry / Kiwi / Pear / Watermelon / Papaya.
7.	Yoga poses	6 p.m.	Perform 30 - 45 min of yoga poses and end the activity with Anulom vilom and Bhrumri Pranayam.
8.	Dinner	8 p.m.	2 Millet / Multigrain Roti, 1 Bowl pulses, 1 bowl vegetables
9.	Bed-time	9 p.m.	1 glass (250ml) warm water with 1- 1.5 g of cinnamon

CONCLUSION

Polycystic Ovarian Syndrome is commonest health problem in women of reproductive age caused by hormonal imbalance due to unhealthy habits, hectic and stressful lifestyle. Women diagnosed with PCOS have profound insulin resistance, obesity and increased level of androgens. Weight reduction is main preventive and therapeutic potential to combat with this catastrophe which can be achieved by incorporating lifestyle modifications. Ayurveda dietary regime the wholesome food (Pathya Ahar) and Yoga interventions mentioned in Ayurveda literature are main key which keeps individual healthy and regulates functions of endocrine system. Breathing techniques (Pranayam) helps a lot in relieving the symptoms of PCOS related to deep rooted mental stress and keep the individual high to fight with this embitter syndrome. All these lifestyle modification increases the fertility rate and improve the quality of lifestyle in patients of PCOS.

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Cite this article as:

Thakur Jyotsna & Masand Sameet. A review on life style modification: The mainstay in polycystic ovarian syndrome. Int. J. Res. Ayurveda Pharm. 2018;9(3):8-13 <http://dx.doi.org/10.7897/2277-4343.09352>

Source of support: Nil, Conflict of interest: None Declared

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