

Effect of Kapalabhati in a Patient with Polycystic Ovarian Syndrome- A Case Report

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ABSTRACT

An eight-week Kapalabhati practice was given to a female aged 19 years who was diagnosed with bilateral Polycystic Ovarian Syndrome (PCOS). Kapalabhati is one of the simplest yet important parts of Shatkarmas in Yoga, which is known to improve metabolic fitness. The PCOS is a complex hormonal disorder with metabolic derangements and insulin resistance as an integral part, which also plays a significant role in its aetiology. The condition can be exacerbated by the co-existence of obesity. Hence, improvement in the metabolic profile is the key step in the management of PCOS.

Keywords: Dysmenorrhea, Kapalabhati, Polycystic ovarian disease, Yoga

CASE REPORT

A 19-year-old unmarried female of height 158 cm and weight 51 kg with a moderately built physique Body Mass Index (BMI: 23.2), large-sized red pimple on the face, hair growth on the chin and profound sweating reported to the Outpatient Department on 21st August 2019 with a clinical history of irregular menstruation for the past two years. The menstrual cycle duration ranged from 45-90 days with 3-4 days heavy menstrual blood flow and moderate pain. She also complained of mood swings and hair loss. She was provisionally diagnosed with the bilateral PCOS. She has not taken any treatment before for the same problem. The Gynaecologist whom she consulted the previous month had prescribed her some hormone pills, Meprate twice daily for 5 days and Diane once daily for 30 days which she was not ready to take. Finally, she decided to practice yoga to manage the symptoms without medications. There was no significant family history relevant to the condition. Her first day of the last menstrual period was on 10th July 2019 and its lasts for 4 days.

A detailed physical examination was carried out. After that a hair pull traction test was carried out to assess the severity of hair loss. Numerical pain rating scale was used to evaluate the intensity of menstrual pain. The patient was given Kapalabhati pranayama 10 minutes daily under supervision for 8 weeks. A well-ventilated room with adequate light has been selected for providing yogic intervention. The patient was advised to wear loose and comfortable cloths during practice. The patient was asked to sit either in Vajrasana or Padmasana, both the palms in chin mudra, keeping her spine erect and eyes closed throughout the practice. The technique was practiced on an empty stomach usually noon time before lunch. The patient has to take a passive inhalation followed by forceful exhalation for a minimum of 60-120 strokes per minute, the same has been given in 3 sets [1]. [Table/Fig-1] describes about the practice of Kapalabhati followed by Normal Breathing (NB) in a single session. The patient was strictly advised not to do any physical exercises or yoga practices for 8 weeks. In addition to this, authors advised her to follow a healthy diet, preferably homemade food by eliminating sugar, junk food and to include more fresh fruits and vegetables.

KB	NB	KB	NB	KB	NB	KB	NB	KB	NB
1 min	1 min	1 min	1 min	1 min	1 min	1 min	1 min	1 min	1 min

[Table/Fig-1]: Pattern of Kapalabhati Practice.
10 Minutes; KB: Kapalabhati; NB: Normal breathing

Outcome measure were noted by - Abdominal ultrasonography:

Transabdominal three-dimensional ultra-sonogram of the pelvis was carried out by a postgraduate medical radiologist. **Hair pull test (hair traction test):** In this test, approximately 20 to 60 hairs are grasped between the thumb, index and middle fingers from the base of the hairs near the scalp and firmly tugged away from the scalp. The hair pull test is considered to be positive if more than 10% of hairs are pulled away indicating active hair shedding [2]. **Numeric Pain Rating Scale (NPRS):** It was used to evaluate the menstrual pain intensity on a scale of 0-10, where 0 indicates no pain and 10 indicates highest pain. Subject was asked to mark the pain intensity on the scale [3]. The variables before and after intervention is shown in [Table/Fig-2].

Variables	Baseline	Post-intervention
Weight (kg)	51	48
BMI (kg/m ²)	23.2	21.9
Hair traction test	More than 15 hair	Less than 7
NPRS score for menstrual pain	8	3
Menstrual cycle	Irregular menstrual cycle (45-90 days)	Regularised menstrual cycle (menstruation at regular intervals of 30 days in next 2 consecutive months)
USG abdomen and pelvis	Bilateral Polycystic Ovary (Ovaries are enlarged in size and shows polycystic morphology Right ovary- 3.4×4×5 cm Left ovary- 4×2.1×2.5 cm)	Bilateral Polycystic morphology (Right ovary -2.5×2.7×2.7 cm Left ovary- 3.3×1.6×3.3 cm)

[Table/Fig-2]: Variables before and after the intervention.
USG: Ultrasonography; NPRS: Numeric pain rating scale

DISCUSSION

Polycystic Ovarian Syndrome (PCOS) is a multifaceted clinical syndrome characterised by elevated androgen levels, menstrual irregularities, and/or small cysts on one or both ovaries, affecting at least 10% of women in reproductive age [4,5]. It comprises reproductive, endocrine, metabolic and psychological features and has a heterogenous aetiology [6,7]. Primary defects in hypothalamic-pituitary axis, insulin secretion and action, and ovarian function is the underlying pathophysiology in PCOS [8]. Hence, the goal in the management of PCOS includes correcting anovulation, inhibiting the action of androgens on target tissues, and reducing insulin resistance which is commonly attempted with pharmacological intervention along with weight reduction [9]. Yoga is a form of mind- body medicine

which is known to improve insulin sensitivity [10,11]. Kapalabhati is one of the cleansing techniques in Yoga and the effect of kapalabhati in PCOS is not yet known. The subject had faith in Yoga practices and found the practice very comfortable, easy to perform and adopt. Kapalabhati was practiced for maximum strokes possible per minute, daily for 10 minutes for a period of 8 weeks.

In the current case, there was a reduction observed in weight which can be attributed to the increased metabolism following kapalabhati practice which is an abdomino-respiratory autonomic exercise. This brings control over autonomic nervous system that in turn effects the endocrine and the metabolic processes [12,13], leading to increase in the basal metabolic rate thereby helping in the reduction of body weight. Improved balance in sympathetic and parasympathetic activity is also shown to be effective in reducing the psychological distress which is often linked with PCOD [14]. Kapalabhati is known to improve the abdominal muscle tone by reducing abdominal fat and significantly affect the body fat percentage [15,16]. In kapalabhati the breathing is done with the high force in a shorter span of time which has a great impact on the abdominal contents especially the glands those results in the improved blood circulation and glandular secretion leading to the better health [17]. Regular practice of kapalabhati is shown to improve the insulin sensitivity which may help in improving the ovarian function [18,19]. Practice of yoga gives a feeling of well-being which in turn reduces the stress. This might have also contributed in regularising the menstrual cycle as psychological factors such as increased stress is known to induce raised levels of cortisol and prolactin which can disrupt normal menstrual cycle [20,21].

PCOS is associated with hyperandrogenism which leads to excess hair loss. Previous study shows that a reduction of 5-7% of body weight can significantly restore the ovulation in up to 80% of PCOD patients by reducing the hyperandrogenism. This might be the possible mechanism underlying the reduction in hair loss following kapalabhati practice as the subject had lost 5.8% of body weight at the end of the interventional period [22]. It is evident from earlier studies that polycystic ovarian morphology is strongly associated with severity of the menstrual pain [23]. In the current study the subject showed a significant reduction in ovarian size along with stress reduction which might have helped in reducing the menstrual pain [24]. However, the results of the present case cannot be generalised and should be validated in the larger sample Randomised Control Trials.

CONCLUSION(S)

This is the first case study reporting the effects of kapalabhati in a patient with PCOD. The intervention given was safe, easily adoptable and feasible and was well tolerated by the subject. No side-effects were reported during the interventional period. The intervention was effective in reducing the body weight, menstrual pain, hair loss and the polycystic ovarian morphological features. Future studies with large sample size would be better in generalising the results. Factors like emotional stress, diet couldn't control as it may influence the outcomes of the study.

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REFERENCES

- [1] Gokhale V, Lakshmeesha DR, Shetty V, Rani V, Naresh Kumar M. Influence of kapalabhati pranayama on oxygen saturation and blood pressure. *International Journal of Medical and Health Research*. 2018;4(9):113-17.
- [2] Dhurat R, Saraogi P. Hair evaluation methods: Merits and demerits. *International Journal of Trichology*. 2009;1(2):108.
- [3] Larroy C. Comparing visual-analog and numeric scales for assessing menstrual pain. *Behavioral Medicine*. 2002;27(4):179-81.
- [4] Umland EM, Weinstein LC, Buchanan EM. Menstruation related disorders. In: DiPiro JT, Talbert RL, Yee GC, et al. *Pharmacotherapy: A Pathophysiologic Approach*, 8th ed. New York: McGraw-Hill; 2011:1393.
- [5] Cutinho AE, Kauffman AS. The role of the brain in the pathogenesis and physiology of Polycystic Ovary Syndrome (PCOS). *Med Sci*. 2019;7:84.
- [6] Rodríguez Paris V, Bertoldo M. The mechanism of androgen actions in PCOS etiology. *Medical Sciences*. 2019;7(9):89.
- [7] Escobar-Morreale H. Polycystic ovary syndrome: Definition, aetiology, diagnosis and treatment. *Nature Reviews Endocrinology*. 2018;14(5):270-84.
- [8] Balen A. The pathophysiology of polycystic ovary syndrome: Trying to understand PCOS and its endocrinology. *Best Practice & Research Clinical Obstetrics & Gynaecology*. 2004;18(5):685-706.
- [9] Ndefo UA, Eaton A, Green MR. Polycystic ovary syndrome: A review of treatment options with a focus on pharmacological approaches. *Pharmacy and Therapeutics*. 2013;38(6):336-55.
- [10] Stephens I. Medical yoga therapy. *Children*. 2017;4(2):12.
- [11] Ramamoorthi R, Gahreman D, Skinner T, Moss S. The effect of yoga practice on glycemic control and other health parameters in the pre-diabetic state: A systematic review and meta-analysis. *PLoS One*. 2019;14(10):e0221067.
- [12] Kekan DR. Effect of kapalabhati pranayama on body mass index and abdominal skinfold thickness. *Indian Medical Gazette, Alternative Medicine*. 2013;431:421-25.
- [13] Chatterjee S, Mondal S. Effect of regular yogic training on growth hormone and Dehydroepiandrosterone Sulfate as an endocrine marker of aging. *Evidence-Based Complementary and Alternative Medicine*. 2014;2014:240581.
- [14] Zangeneh FZ, Jafarabadi M, Naghizadeh MM, Abedinia N, Haghollahi F. Psychological distress in women with polycystic ovary syndrome from Imam Khomeini Hospital, Tehran. *Journal of Reproduction & Infertility*. 2012;13(2):111.
- [15] Nayak R, Prakash S, Yadav R, Upadhyay-Dhungel K. Kapalabhati changes cardiovascular parameters. *Janaki Medical College Journal of Medical Science*. 2016;3(2):43-49.
- [16] Ruhai A, Bhandari R, Chakravarti R. Effect of kapalabhati on selected body composition variables. *British Journal of Sports Medicine*. 2010;44(Suppl.1):i70-i70.
- [17] Ansari R. Kapalabhati pranayama: An answer to modern day polycystic ovarian syndrome and coexisting metabolic syndrome? *International Journal of Yoga*. 2016;9(2):163.
- [18] Raja B, Preetha S, Priya J. Effect of Kapalabhati Pranayama in the blood sugar level in diabetic patients. *Drug Invention Today*. 2018;10(11):2235-37.
- [19] Barber T, Dimitriadis G, Andreou A, Franks S. Polycystic ovary syndrome: Insight into pathogenesis and a common association with insulin resistance. *Clinical Medicine*. 2016;16(3):262-66.
- [20] Kadam R, Shinde K, Kadam R, Kulkarni M, Dimple D. Contemporary and traditional perspectives of Polycystic Ovarian Syndrome (PCOS): A critical review. *IOSR Journal of Dental and Medical Sciences*. 2014;13(9):89-98.
- [21] Chong CS, Tsunaka M, Chan EP. Effects of yoga on stress management in healthy adults: A systematic review. *Alternative Therapies in Health and Medicine*. 2011;17(1):32.
- [22] Ranade A, Acharya R. Ayurvedic management of aartavakshayaw.s.r. polycystic ovarian syndrome- A critical review. *Ayurpharm Int J Ayur Alli Sci*. 2017;6(4):69-82.
- [23] Jeong J, Kim M, Lee I, Yun J, Won Y, Yun B, et al. Polycystic ovarian morphology is associated with primary dysmenorrhea in young Korean women. *Obstetrics and Gynaecology Science*. 2019;62(5):329.
- [24] Wang L. Stress and dysmenorrhoea: A population based prospective study. *Occupational and Environmental Medicine*. 2004;61(12):1021-26.

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