
Effect of Neutral Hip Bath on Pupillary Light Reflex among Poly Cystic Ovarian Syndrome: A Case Report

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Research Paper

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ABSTRACT

Polycystic ovary syndrome (PCOS) is a common endocrine disorder that affects 8-13% of women of reproductive age, with a higher prevalence observed among Indian women. This case report aimed to evaluate the effect of a Neutral hip bath on autonomic function, as assessed by the pupillary light reflex, in a patient with PCOS.

Methodology:

A 21-year-old female patient presented with irregular menstruation and severe pain since her first period. She was diagnosed with polycystic ovary syndrome (PCOS) and grade-two obesity. The patient was advised a six-month intervention involving neutral hip baths. The pupillary light reflex (PLR) was measured using infrared videography before and after the intervention to assess factors related to autonomic nervous system (ANS) activity.

Results:

After the six-month neutral hip bath intervention, there was a significant increase in pupillary constriction, indicating a shift toward parasympathetic dominance. This positive change correlated with reduced pain, increased vagal modulation, and decreased sympathetic activity, suggesting enhanced psychological self-regulation.

Conclusion:

The results of this case report suggest that neutral hip baths may have a therapeutic impact on PCOS. They may play a role in promoting relaxation, reducing pain, and enhancing autonomic balance. It is imperative to conduct larger-scale studies to authenticate and broaden these initial findings, underscoring the significance of non-pharmaceutical interventions in addressing PCOS and its related symptoms.

Background

Polycystic Ovary Syndrome (PCOS) is one of the most common endocrine disorders that affects women in their reproductive age, having a range of symptoms like interrupted menstrual cycles, acne, insulin resistance as well as autonomic dysfunction(Lakshmi et al., 2023; Venugopal, Deenadayalan, Ashokkumar, et al., 2022). The prevalence rate of PCOS in India is estimated to be around 10% of women of reproductive age(Boopalan, Vijayakumar, Ravi, Kunjumon, et al., 2023; Ganie et al., 2020; Lakshmi et al., 2023). However, due to underreporting and misdiagnosis, the actual number of women affected by PCOS in India may be even higher(Boopalan, Venugopal, et al., 2023; Vanitha et al., 2018). The autonomic nervous system (ANS) which comprises the parasympathetic and sympathetic nervous systems(Arvind et al., 2020; Boopalan, Vijayakumar, Ravi, Narayanasamy, et al., 2023; Lalitha et al., 2021). That help in regulating the body's voluntary and involuntary functions may exhibit dysregulation in patients with PCOS, thereby leading to abnormalities in the pupillary light reflex (PLR)(Benjamin et al., 2020; Benjamin et al., 2021; Maruthy et al., 2020; Palanimurugan et al., 2024). Many patients with PCOS are confidently seeking alternative remedies due to the significant side effects associated with prescribed medications and treatments(Balakrishnan et al., 2023; Boopalan, Vijayakumar, Ravi, & Kuppusamy, 2023). Naturopathy, a type of alternative and integrative medicine, uses five elements as the primary therapy(B. Deenadayalan et al., 2022; Boopalan Deenadayalan et al., 2022). The five elements—earth, water, air, fire, and ether—are used to promote holistic healing and general well-being(Jerrin et al., 2021; Maheshkumar, Venugopal, et al., 2020; Prabu et al., 2021). The pupillary light reflex (PLR), a reflex response of the pupil to the light, is a vital assessment of ANS function(Maheshkumar et al., 2016; Siva kumar et al., 2022b). Previous research has indicated that

hydrotherapy practices, such as hip baths and massage, may be effective in managing the autonomic dysfunction associated with PCOS (Anburani et al.; Geethanjali et al., 2020; Maheshkumar et al., 2021). Hence this case report aimed at the effect of neutral hip baths on pupillary light reflex among Polycystic Ovarian Syndrome.

Case Detail

A 21-year-old female came to our outpatient department with chief complaints of irregular periods, increased frequency of blood flow during menstruation, pain during menstrual pain, acne, and weight gain over 2 years. She was diagnosed with PCOS and obesity in grade two (weight: 89 kg, Height: 169 cm). Two years before she began the six-month PCOS treatment, she dealt with weight gain, malaise, nausea, and vomiting. Following conventional medication, she shifted to Siddha medication for one year, the menstrual phase was reduced from 90 days to 55 days, weight was not reduced but she was unhappy. Family history was not found. The patient received a neutral hip bath as an intervention from November 2023 to May 2024, for 5 months.

Intervention Procedure

A day before the study, the entire study procedure was explained to the patient by a yoga and naturopathy physician. The subject was advised to drink two glasses of water come in on an empty stomach and sit in a hip bathtub filled with cold water (33 degrees Celsius) on an empty stomach then rub the abdomen from the navel downwards with wet cloth (Bnys et al., 2012). The study was conducted preferably from 8 to 9 am for six months. Follow-up was conducted in May 2024 to check for the reoccurrence of symptoms. As of now, there has been no reoccurrence.

Pupillary light reflex assessment:

A PC-based infrared pupillometer was created using a web camera and a virtual reality box (Siva Kumar et al., 2022a; Siva kumar et al., 2020; Siva Kumar et al., 2021a, 2021b). Pupillary light reflex (PLR) is thoroughly assessed across various parameters including Maximum Constriction Velocity (MCV), Maximum Redilation Velocity (MRV) (Kumar et al., 2021; Sivakumar et al., 2020).

Results

The PLR parameters before and after the Neutral hip bath revealed notable changes indicative of a parasympathetic dominant influence. Maximum constriction velocity (MCV) increased from 1.4 mm/s to 3.4 mm/s, indicating a notable constriction velocity under parasympathetic modulation. On the

contrary, the maximum redilation velocity (MRV) exhibited an increase from 1.9 mm/s to 4.4 mm/s, indicating an augmentation in parasympathetic-mediated dilation.

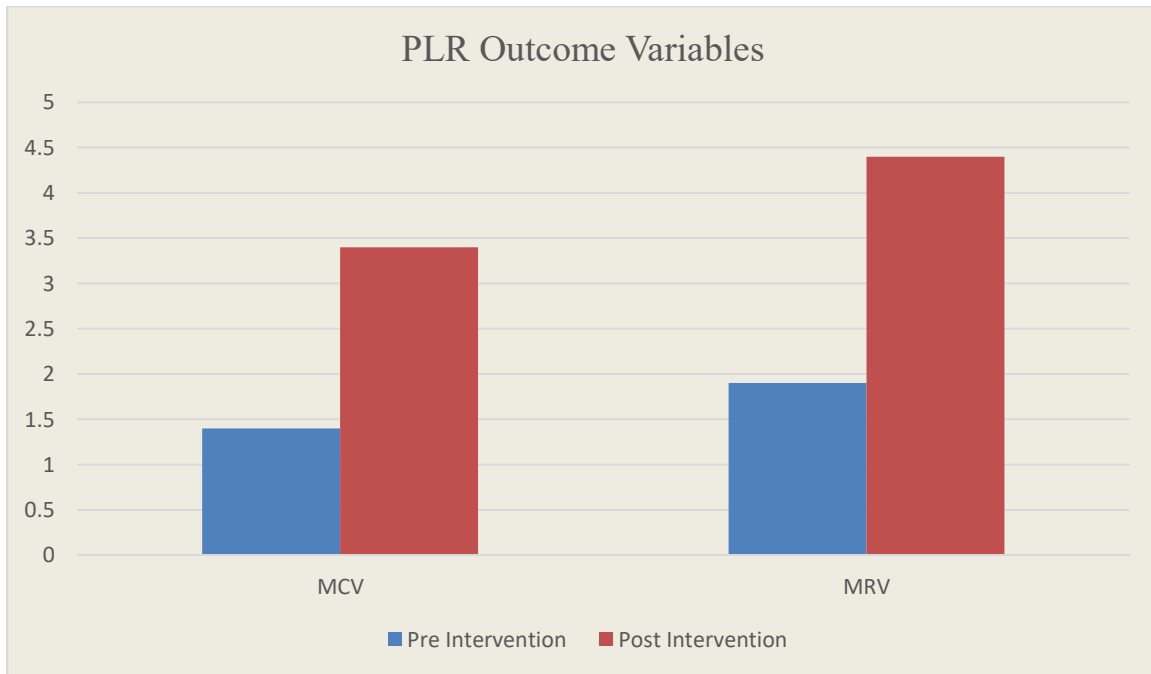


Figure: 01 Effect of Neutral hip bath on PLR

Discussion

In this study, we observed that a six-month neutral hip bath intervention resulted in a notable improvement in PCOS. This is the first-ever case report documenting the impact of hip bath management on PCOS with PLR. A neutral hip bath is a soothing and relaxing way to alleviate discomfort and promote healing (Abhijna & Shetty, 2023; Mohamed et al., 2023). The water helps to increase blood flow to the pelvic area, reducing inflammation and promoting relaxation of pelvic muscles (Prema Latha, 2018; Stein & Hughes, 2016). Taking a neutral hip bath can be especially beneficial for those experiencing menstrual cramps, hemorrhoids, or urinary tract infections (Sivakumaran, 2018). This case report examines the effect of neutral hip baths on autonomic function in a patient with Polycystic Ovary Syndrome (PCOS), a common endocrine disorder affecting women of reproductive age. This case study found that a six-month intervention with neutral hip baths improved parasympathetic dominance, with changes in PLR parameters suggesting increased parasympathetic activity and reduced sympathetic influence. This was supported by a decrease in

Absolute Constriction Amplitude, indicating a shift towards parasympathetic modulation(Kumar et al., 2023; Shobana et al., 2022; Thanalakshmi et al., 2020). The patient experienced improved quality of life, resulting in reduced menstrual pain and more regular cycles. This led to a decrease in psychological stress and a sense of well-being. Hydrotherapy, particularly hip baths, has been shown to positively affect autonomic balance and overall health(Ajmi et al., 2024; Shamsunisha et al., 2023). The pain reduction and improved menstrual regularity may be attributed to enhanced vagal modulation, which promotes vagus nerve activity, a crucial component of the parasympathetic nervous system(Benjamin et al., 2023; Rohini et al., 2022; Roy et al., 2018). Previous studies also indicate that hydrotherapy can improve blood circulation, reduce inflammation, and alleviate muscle tension, all of which can contribute to the overall well-being of individuals with menstrual issues(Maheshkumar, Pandiaraja, et al., 2020; Nandakumar et al., 2023; Pandiaraja et al., 2022; Pandiaraja et al., 2021; Susila & Suganthi, 2017). Additionally, neutral hip baths may help to relax the pelvic muscles and reduce the severity of menstrual cramps(Dauneria & Keswani, 2014; Venugopal, Deenadayalan, Maheshkumar, et al., 2022). This combination of physical and physiological benefits suggests that hydrotherapy could be a valuable treatment option for women seeking natural and non-invasive ways to manage menstrual symptoms and improve their quality of life.

Conclusion

Research on hydrotherapy for menstrual issues highlights its potential as a holistic and effective treatment option. Thus, hydrotherapy enables a gentle and natural treatment of the symptoms associated with menstruation that affects the body and emotions. Further studies and clinical trials are needed to fully understand the mechanisms behind hydrotherapy's benefits and to optimize its use in menstrual health care.

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