Original Research Article

The effect of progressive muscle relaxation on depression in polycystic ovarian syndrome

Jyoti Parle, Aishwarya D. Savant*

Department of Physiotherapy, MGM College of Physiotherapy, Kamothe, Maharashtra, India

*Correspondence:
Dr. Aishwarya D. Savant,
E-mail: aishusavant@gmail.com

ABSTRACT

Background: Polycystic ovary syndrome (PCOS) is the most common endocrine disorder among women of reproductive age. Authors explored the effects of progressive muscle relaxation (PMR) on depression in females with polycystic ovarian syndrome (PCOS).
Methods: In a 4-week study duration in which the intervention was for three times a week, 30 females which were selected according to the inclusion and exclusion criteria received a PMR protocol in which subjects were taught to contract and relax 16 muscle groups. The Becks Depression Inventory (BDI) was taken before and after the intervention as a depression analysis tool.
Results: After 4 weeks of intervention, the patients showed significant improvement in depression ($P < 0.05$).
Conclusions: In conclusion, this study suggests that PMR practice is effective in improving depression, in patients with PCOS.

Keywords: Depression, Polycystic ovarian syndrome, Progressive muscle relaxation

INTRODUCTION

Polycystic ovary syndrome (PCOS) is the most common endocrine disorder among women of reproductive age.[1] It is associated with significant morbidity including impaired reproductive health, psychosocial dysfunction, metabolic syndrome, cardiovascular disease, and increased cancer risk.[2]

PCOS is accompanied by an array of symptoms such as obesity, acne, scalp hair thinning, menstrual irregularity, and sub fertility. These symptoms can also contribute to psychological impairment.[3]

Polycystic ovary syndrome (PCOS) is a heterogeneous endocrine and metabolic disorder, characterized by chronic oligomenorrhea, hyperandrogenism and insulin-resistance.[4] Clinicians should be cognizant that since

PCOS is associated with significant metabolic and psychological co morbidity and screening should be executed properly.[2]

Polycystic ovary syndrome (PCOS) manifests itself with various symptoms; therefore, it interests representatives of many medical specializations.[5]

Women with PCOS on average tend to experience mildly elevated anxiety and depression, significantly more than women without PCOS.[5]

Several surveys have confirmed that PCOS is clearly associated with psychological disorders such as depression, anxiety, and binge eating disorder, and health-related quality of life.[6] Eating disorders and suicidal behaviour are also overrepresented among women with PCOS.[7]

According to current diagnostic criteria, depression is characterized by five or more of the following symptoms being present concurrently for at least two weeks: depressed mood, loss of interest in previously pleasurable activities, feelings of inappropriate guilt or worthlessness, recurrent thoughts of death or suicide, psychomotor slowing or agitation, disturbance of appetite, disturbance of sleep, disturbance of energy, and impaired concentration.[8]

In addition to the gynaecological, endocrine and metabolic features of PCOS, a number of psychological correlates have been identified. Quality of life and psychological well-being are reduced in women with PCOS (Elsenbruch et al, Coffey et al and Barnard et al).[9-11] Women with PCOS appear to have poorer psychological health-related quality of life than women with a number of other physical conditions including asthma, epilepsy, diabetes and back pain (Coffey et al).[11]

Depression is more prevalent in women with PCOS (Hollinrake et al, Kerchner et al) and higher scores on self-reported depression symptoms have been observed in women with PCOS.[12,13,7]

There is also increasing evidence that women with PCOS have an increased risk of mood and anxiety disorders (Barry et al, Dokras et al and Veltman-Verhulst et al).[14-17] The etiology of this association has not been well established, but potential proposed mechanisms include obesity, insulin resistance, elevated androgens, abnormalities in the hypothalamic pituitary axis and increased inflammatory markers (Farrell and Antoni).[18]

Although pharmacotherapy can successfully treat anxiety and depression, psychiatric medications alone or through their interaction with other drugs can produce side effects, and some patients are unwilling to take psychiatric medications. Some patients may be reluctant to take any additional drugs, perceiving that as a sign of loss of control and personal weakness in the handling of their illness. Relaxation techniques have been shown as an effective adjunctive therapy for anxiety and depression.[19]

Progressive Muscle Relaxation (PMR) is a systematic technique used to achieve a deep state of relaxation and has been shown to improve health-related quality of life in a variety of medical and psychiatric illnesses.[19] In the present study, we for the first time explored the effects of PMR as a psychosomatic intervention in depression in patients with PCOS.

Progressive Muscle Relaxation (PMR) was originally developed by Edmund Jacobson in 1938. Bernstein and Borkovec later shortened this technique to 16 muscle groups and found it to be equally effective.[20] It was developed by Edmund Jacobson based on the theory of psycho-biological state called neuromuscular

hypertension as the basis for a variety of negative emotional states and psychosomatic diseases.[21]

PMR is a primary method that can be easily learned to achieve relaxation. It is an effective intervention in reducing emotional distress.[19] PMR is a physical stimulation and mental peace with emphasis on muscle systematic stretching and release (contraction-release).[22]

METHODS

Patients

From September 2017 to December 2017, 30 patients with polycystic ovarian syndrome aged 18 to 30 years were enrolled in this study at MGM college, kamothe. This study was an experimental and purposive study in which 40 women participated out of which 30 women were recruited according to the inclusion and exclusion criteria. In a study duration of 4 weeks, (3 sessions per week) each patient received 12 sessions in all. Depression was assessed using the Becks Depression Inventory (BDI) and a score of minimum 11 was required to be qualified to be a part of the study. The assessment was performed at the beginning of the study and the end of 4 weeks (Table 1). Written informed consent form was obtained from all participating patients before the start of the study.

Inclusion criteria

- Females diagnosed with polycystic ovarian syndrome by the gynaecologist
- Women between age of 18-30 years
- Women who scored 11 or higher than that on the BDI.

Exclusion criteria

- Women who scored 11 or higher than that on the BDI
- Antidepressants
- Psychotherapy for depression.

Instruments

Depression was assessed using the Becks Depression Inventory and a score of 11 or more out of a possible 63 was required to be a part of the study. The Beck Depression Inventory, created by Aaron T. Beck, is a 21-question multiple- choice self-report inventory, one of the most widely used psychometric tests for measuring the severity of depression. This is a Likert type self-reported scale that consists of 21 items (7,8). This scale measures and identifies emotional, cognitive, physical, and motivational symptoms of depression objectively. Each question has 4 options given, with scores between 0 and 3.[23] The depression score is determined by the sum of all items. The total score ranges from 0-63 and then the total score is compared to a key to determine the depression's

severity. Higher total scores indicate more severe depressive symptoms.

Intervention

The PMR intervention had four weeks of PMR practice which followed previously standardized and validated procedures based on a classic relaxation program by Jacobson. This technique involved systematically relaxing the major muscle groups of the body with the goal of physical and mental relaxation. The PMR intervention included PMR practice sessions over 4 weeks, thrice per week.

The first session included an introductory group discussion of anxiety and depression in patients with PCOS at first. Then the subjects were taught how to relax and contract 16 muscle groups (including muscles of the right hand and forearm, right biceps, left hand and forearm, left biceps, forearm, upper section of cheeks and nose, lower section of cheeks and nose, neck and throat, chest, shoulders and upper part of back, abdominal region and stomach, right thigh, right calf, right foot, left thigh, left calf, and left foot) as previously described.

From the second to the twelfth group sessions, only group PMR practice was performed. All patients were evaluated with BDI before and after the intervention.

Data collection

All patients were evaluated with BDI before and after the intervention. All patients also underwent a clinical check-up in which BMI and demography data was taken (Table 2).

Statistical analysis

Statistical analyses were performed with SPSS 20.0 for Windows. For continuous variables, all values were expressed as mean ± SD. The depression scores before and after intervention was tested using paired t-test. P <0.05 was considered statistically significant in this study.

RESULTS

The data of 30 samples which was collected and recorded in the Excel 2007 spreadsheet was then analysed using Statistical Package for the Social Science (SPSS) software. The qualitative variables were expressed as absolute number and percentage, and the quantitative variables were expressed as mean and standard deviation. Further Shapiro-wilk test was used to analyse normality of quantitative data and the result was that the data was not normally distributed. So, the non-parametric test was used for the data analysis in software.

Majority of the women have mild mood disturbance that is 67 % and followed by borderline clinical depression which is 20 % (Figure 1).
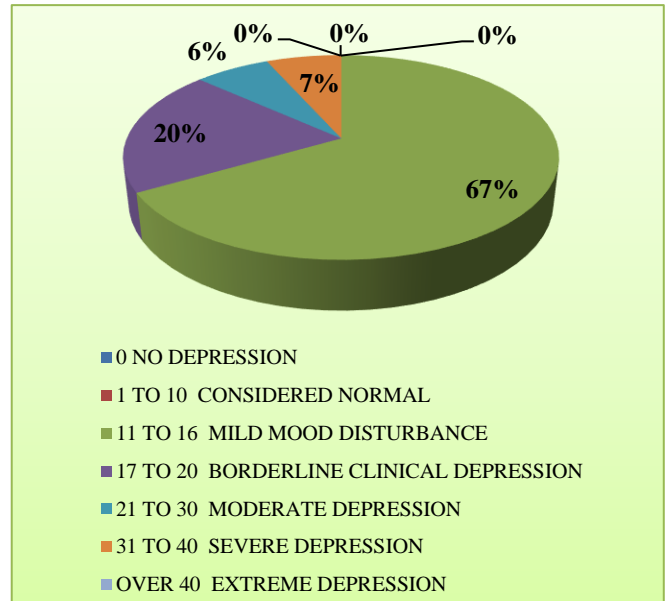

Figure 1: Number of people who have depression.

33% of females were in the overweight category a significant co morbid factor related to increased risk of depression. Also, 7% of population were at a high risk of overweight which may contribute to depression. (Overweight (not obese), if BMI is 25.0 to 29.9. Class 1 (low-risk) obesity, if BMI is 30.0 to 34.9. Class 2 (moderate-risk) obesity, if BMI is 35.0 to 39.9. Class 3 (high-risk) obesity, if BMI is equal to or greater than 40.0.) (Figure 2).
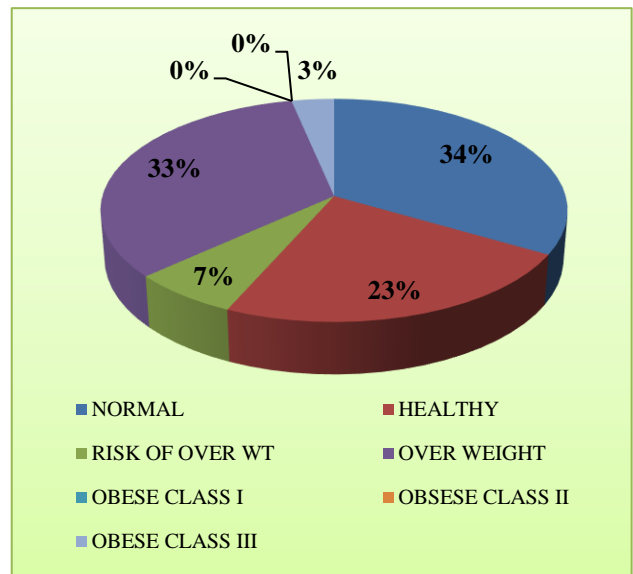
Figure 2: Distribution of females according to BMI.
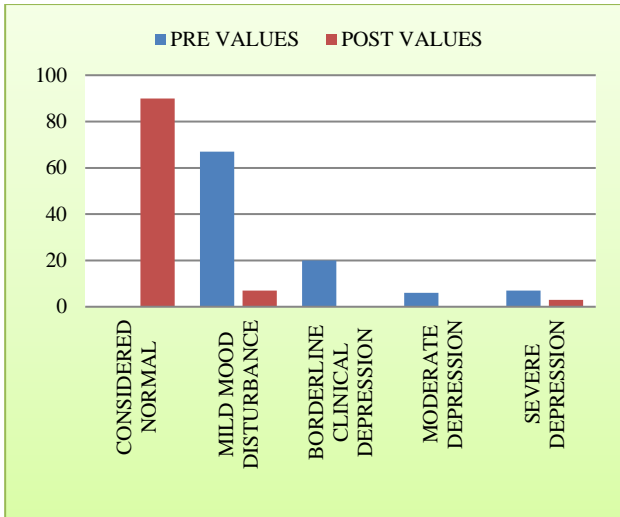
Figure 3: Pre-value and post value in percentage of BDI.

67% women had mild mood disturbance and 20% had borderline clinical depression and 7% had severe depression while 6% had moderate depression. After 4 weeks of PMR 90% were considered normal and 7% had mild mood disturbance and 3% had severe depression. (Figure 3).

There is difference between the pre and post values of BDI with p value= 0.00 (<0.05) which is highly significant as per calculated by Wilcoxon Signed Rank Test which shows significant improvement in depression.

Table 3 Pre-value and post value in percentage of BDI.

	Pre- value	Post-value
Mean and SD	16.03±6.76	6.9±5.16
p value	0.00	0.00

DISCUSSION

The present study aimed at finding the effect of progressive muscle relaxation on depression in women diagnosed with polycystic ovarian syndrome. 30 individuals were carefully selected according to the inclusion and exclusion criteria to participate in the study. The present study showed that clinical signs of PCOS were most closely associated with psychological distress which has important implications in the diagnosis and treatment of disorders.[24] Out of 30 females, 67% females were in the mild mood disturbance category, 20 % were in the borderline clinical depression, 7% were severely depressed and 6% were in the moderate depression.

Present study findings suggest an increased risk of depression of a significant magnitude in the young PCOS population emphasizing the importance of screening and appropriate follow up in the population. The relationship between polycystic ovary syndrome and psychiatric disorders, however, is an unclear relationship as there is no clear evidence that states a reason for depression in PCOS but involvement of various factors.

It is seen that 33% of females were in the overweight category which is also significant related to increased risk of depression as its one of the common morbidity and 7% of population were at a high risk of overweight.

The effects of progressive muscle relaxation were significant for depression which was shown by a reducing in the post BDI in the patients throughout 1-4 weeks of the study. The difference between the mean values of pre BDI and post BDI which was taken after a span of 4 weeks which was at the end of the protocol suggest that significant improvement and thus helping in improving the quality of life of the patients.

Further a large population-based study from Sweden (Cesta et al) and data from hospital admissions in Western Australia (Hart and Doherty) confirm that women with PCOS are at an increased risk of depression and anxiety disorders.[25,26]

The Australian PCOS guidelines recommend that women with PCOS be routinely screened for depression and anxiety and assessed by appropriately qualified health professionals (PCOS Australian Alliance, 2015). Present data support the consideration of implementation of these guidelines to women with PCOS around the world. Future studies should focus on the follow-up of women with PCOS and the long-term impact of PCOS-related treatments on depressive symptoms in this high-risk population.

The practice of PMR has been proven to decrease or delay the onset of conditioned symptoms. Regular practice of PMR can also enhance coping ability in a variety of stressful situations.

In addition, many empirical studies have found that PMR can enhance feelings of self-control. When PMR is practiced regularly, it provides patients with an intimate familiarity with tension and produces feelings of relaxation throughout the body, which helps to reduce anxiety over time. It is hypothesized that PMR may help in depression because of its effectiveness in reducing anxiety, which frequently co-occurs with depression.

Present study limitations were that authors could not exclude environmental factors that could have ruled out other causes of depression. Also, further studies with an increased sample size should be considered. Authors were unable to evaluate other potential factors that might contribute to the development of depression in women with PCOS.

REFERENCES

1. Rasgon NL, Rao RC, Hwang S, Altshuler LL, Elman S, Zuckerbrow-Miller J, et al. Depression in women with polycystic ovary syndrome: clinical and biochemical correlates. J Affective Dis. 2003;74(3):299-304.
2. Kamboj MK, Bonny AE. Polycystic ovary syndrome in adolescence: diagnostic and therapeutic strategies. Translation Pediatr. 2017;6(4):248.
3. Blay SL, Aguiar JV, Passos IC. Polycystic ovary syndrome and mental disorders: a systematic review and exploratory meta-analysis. Neuropsych Dis Treatment. 2016;12:2895.
4. Sadrzadeh S, Hui EV, Schoonmade LJ, Painter RC, Lambalk CB. Birthweight and PCOS: systematic review and meta-analysis. Hum Rep Open. 2017;2017(2).
5. Barry JA, Kuczmierczyk AR, Hardiman PJ. Anxiety and depression in polycystic ovary syndrome: a systematic review and meta-analysis. Hum Reprod. 2011;26(9):2442-51.
6. Tan J, Wang QY, Feng GM, Li XY, Huang W. Increased risk of psychiatric disorders in women with polycystic ovary syndrome in Southwest China. Chinese Med J. 2017;130(3):262.
7. Jedel E, Waern M, Gustafson D, Landen M, Eriksson E, Holm G, et al. Anxiety and depression symptoms in women with polycystic ovary syndrome compared with controls matched for body mass index. Hum Reprod. 2009;25(2):450-6.
8. Prathikanti S, Rivera R, Cochran A, Tungol JG, Fayazmanesh N, Weinmann E. Treating major depression with yoga: s prospective, randomized, controlled pilot trial. PloS One. 2017;12(3):e0173869.
9. Elsenbruch S, Hahn S, Kowalsky D, Offner AH, Schedlowski M, Mann K, et al. Quality of life, psychosocial well-being, and sexual satisfaction in women with polycystic ovary syndrome. J Clin Endocrinol Metab. 2003;88:5801-7.
10. Barnard L, Ferriday D, Guenther N, Strauss B, Balen AH, Dye L. Quality of life and psychological well-being in polycystic ovary syndrome. Hum Reprod. 2007;22:2279-86.
11. Coffey S, Bano G, Mason HD. Health-related quality of life in women with polycystic ovary syndrome: a comparison with the general population using the Polycystic Ovary Syndrome Questionnaire (PCOSQ) and the Short Form-36 (SF-36). Gynecol Endocrinol 2006;22:80-6.
12. Hollinrake E, Abreu A, Maifeld M, Van Voorhis BJ, Dokras A. Increased risk of depressive disorders in women with polycystic ovary syndrome. Fertil Steril. 2007;87:1369-6.
13. Kerchner A, Lester W, Stuart SP, Dokras A. Risk of depression and other mental health disorders in women with polycystic ovary syndrome: a longitudinal study. Fertil Steril. 2009;91:207-12.
14. Barry JA, Kuczmierczyk AR, Hardiman PJ. Anxiety and depression in polycystic ovary syndrome: a systematic review and meta-analysis. Hum Reprod. 2011b;26:2442-51.
15. Dokras A, Clifton S, Futterweit W, Wild R. Increased risk for abnormal depression scores in women with polycystic ovary syndrome: a systematic review and meta-analysis. Obstet Gynecol. 2011;117:145-52.
16. Dokras A, Clifton S, Futterweit W, Wild R. Increased prevalence of anxiety symptoms in women with polycystic ovary syndrome: systematic review and meta-analysis. Fertil Steril. 2012;97:225-30.
17. Veltman-Verhulst SM, Boivin J, Eijkemans MJ, Fauser BJ. Emotional distress is a common risk in women with polycystic ovary syndrome: a systematic review and meta-analysis of 28 studies. Hum Reprod Update. 2012;18:638-51.
18. Cooney LG, Lee I, Sammel MD, Dokras A. High prevalence of moderate and severe depressive and anxiety symptoms in polycystic ovary syndrome: a systematic review and meta-analysis. Hum Reprod. 2017;32(5):1075-91.
19. Li Y, Wang R, Tang J, Chen C, Tan L, Wu Z, Yu F, Wang X. Progressive muscle relaxation improves anxiety and depression of pulmonary arterial hypertension patients. Evidence-Based Complem Altern Med. 2015;2015.
20. Lolak S, Connors GL, Sheridan MJ, Wise TN. Effects of progressive muscle relaxation training on anxiety and depression in patients enrolled in an outpatient pulmonary rehabilitation program. Psychotherap Psychosomat. 2008;77(2):119-25.
21. Sundram BM, Dahlui M, Chinna K. Effectiveness of progressive muscle relaxation therapy as a worksite health promotion program in the automobile assembly line. Indul Health. 2016;54(3):204-14.
22. Shahriari M, Dehghan M, Pahlavanzadeh S, Hazini A. Effects of progressive muscle relaxation, guided imagery and deep diaphragmatic breathing on quality of life in elderly with breast or prostate cancer. J Educat Health Promotion. 2017;6.
23. Balikci A, Erdem M, Keskin U, Zincir SB, Guelsuen M, Oezcelik F, et al. Depression, anxiety, and anger in patients with polycystic ovary syndrome. Neuro Psychiatry Arch. 2014;51(4):328.
24. Zangeneh FZ, Jafarabadi M, Naghizadeh MM, Abedinia N, Haghollahi F. Psychological distress in women with polycystic ovary syndrome from Imam Khomeini Hospital, Tehran. J Reprod Infertil. 2012;13(2):111.
25. Cesta C, Mansson M, Palma C. Polycystic ovary syndrome and psychiatric disorders: co-morbidity and heritability in a nationwide Swedish cohort. Psychoneuroendocrinol. 2016;73:196-203.
26. Hart R, Doherty DA. The potential implications of a PCOS diagnosis on a woman's long-term health using data linkage. J Clin Endocrinol Metab. 2015;100:911-9.

Cite this article as: Parle J, Savant AD. The effect of progressive muscle relaxation on depression in polycystic ovarian syndrome. Int J Reprod Contracept Obstet Gynecol 2018;7:3029-33.