EFFECT OF 1 WEEK ‘61-POINTS RELAXATION TRAINING’ ON COLD PRESSOR TEST INDUCED STRESS IN PREMENSTRUAL SYNDROME

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Abstract: The present study was conducted on 50 clinically healthy women volunteers who were in their reproductive age group and in their premenstrual period. Thirty women having premenstrual syndrome (PMS) were compared with 20 control women to evaluate 1 week training of 61-points relaxation (61-PR) yogic exercise. In both the groups cold pressor test (CPT) was performed; and systolic blood pressure (SBP; mmHg), diastolic blood pressure (DBP; mmHg) and heart rate (HR/min) were measured. Basal SBP, DBP and HR of women with PMS was significantly higher than the control subjects with P value 1.2E-05, 0.000583 and 0.005707 respectively, suggesting the presence of stress in women with PMS. Immediately after CPT, the said parameters were statistically significantly more raised in PMS group than control group (P = 6.14E-05, 2.78E-06, 0.003799) respectively. Following 1 week of 61-PR training, the control group showed a significant decline in SBP, DBP & HR (P = 0.00769384, 0.00852894, 0.62316217) respectively. However, the PMS group showed a statistically highly significant reduction in SBP, DBP & HR (P = 2.55E-07, 4.35E-07 and 6.49E06) respectively immediately after CPT. These results suggest a reduction in sympathetic activity by 61-PR training and it can be used as an effective relaxation tool during premenstrual stress.

Key words: 61-points relaxation premenstrual syndrome cold pressor test yogic exercise

INTRODUCTION

Modern age is the age of stress and stress induced disorders which pose a great challenge to the present society. Stress disturbs the balance of sympathetic and parasympathetic nervous system. The sympathetic aspect of stress response occurs quickly and brings on an increased HR, BP, sweat production, brain activity, muscle strength and basal metabolic rate. Too much stress, or constant stress with no respite for the body and mind, can interfere with numerous physical and mental abilities (1).
Premenstrual syndrome is a psychoneuroendocrine disorder with biologic, psychological and social components along with stress as its major cause. It is a disease which is related to premenstrual stress level (2, 3).

Newer theories for PMS suggest a combined psycho-physiologic etiology and concomitant non-pharmacological treatment modes encompassing self-care and stress management skills.

The practice of Yoga is well-demonstrated to reduce the physical effects of stress on the body (4). A classical relaxation posture in yoga is known as the corpse pose or “shavasana”. The ancient Hath Yoga manual describes deeper forms of relaxation like “traveling through your own corpse”. The 61-PR is a modified version of this technique used to relax the mind and body which in turn reduces stress and calms down anxiety (5, 6).

CPT is a standard parameter to assess the activity of sympathetic nervous system. To study the stress, HR and BP responses to CPT have been used for over 70 years in the diagnosis of hypertension and other cardiac autonomic disorders. In the present study, the effect of 61-PR training was seen on CPT-induced stress in PMS (7).

**MATERIAL AND METHODS**

Fifty female volunteers in the age group of 25–35 years were recruited for this study. A “Premenstrual Distress Questionnaire” was used to evaluate the symptoms of PMS. On the basis of history and clinical examination, clinically healthy subjects with normal menstrual cycles were included in the study and accordingly divided into two subgroups:

- **Group A**: Those who were suffering from PMS.
- **Group B**: Those who were not suffering from PMS (8).

The experimental protocol was explained to them and a detailed informed written consent was obtained from each subject. All the procedures were non-invasive and the study plan was approved by the Ethics Committee of the Himalayan Institute of Medical Sciences. The level of stress in premenstrual period was assessed by CPT.

**Experimental protocol**

**Step 1**: The subjects in their premenstrual phase (4 days before their due date of menses) were asked to report at 9 A.M. After a rest of 10 minutes in sitting position, CPT was done.

Room temperature was kept in thermoneutral zone. Noninvasive resting BP and HR were recorded from left arm using an automated digital sphygmomanometer (Panasonic, Omron). The subject was then asked to dip the right hand in cold water at 8°C for 2 min. After removal of hand from cold water, the BP and HR were recorded from left arm immediately, after 1 min and again after 5 minutes in recovery period (9).

**Step 2**: The subjects were asked to report for 61-PR training 11 days before the onset of next menses. The training was given
everyday at the same time over a period of one week by a yoga trainer. During training, the subject was requested to maintain a comfortable supine position and was then guided into visual imagery to concentrate on various nodal points in various parts of the body, whereby these parts get systematically relaxed and the body goes into profound relaxation (6, 10).

**Step 3:** On the last day of training, CPT was done again, with recording of BP and HR.

Mean and standard deviation (± SD) of all observations were calculated and pre-relaxation and post-relaxation values of control and those of PMS group were compared by applying Student’s ‘t’-test (paired). Analysis was tabulated with the help of ‘Microsoft Excel’ (Microsoft Office 2003). Statistical significance was assigned at P<0.05.

**RESULTS**

The results are summarized in Table I. Basal SBP, DBP and HR of women with PMS were significantly higher than the control subjects with P values of 1.2E-05, 0.000583, 0.005707 respectively.

The said parameters immediately after CPT were significantly more increased in PMS group than control group (P = 6.1441E-05, 2.77941E-06, 0.003799086). After 1 week training of 61-PR, a significant fall in these parameters was observed both in PMS group as well as in control group. However, in women with PMS group, the reduction in SBP, DBP and HR was found to be statistically highly significant (P = 1.9479E-

<table>
<thead>
<tr>
<th>PMS</th>
<th>SBP</th>
<th>Prerelaxation</th>
<th>Postrelaxation</th>
<th>DBP</th>
<th>Prerelaxation</th>
<th>Postrelaxation</th>
<th>HR</th>
<th>Prerelaxation</th>
<th>Postrelaxation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resting</td>
<td>114.2±5.68</td>
<td>****</td>
<td>107.7±5.18</td>
<td>****</td>
<td>79.5±4.62</td>
<td>****</td>
<td>74.8±4.14</td>
<td>****</td>
<td>81.2±6.36</td>
</tr>
<tr>
<td>Immediately after CPT</td>
<td>129.4±6.85</td>
<td>****</td>
<td>120.2±4.96</td>
<td>****</td>
<td>89.4±4.73</td>
<td>****</td>
<td>83.1±3.88</td>
<td>****</td>
<td>89.6±6.33</td>
</tr>
<tr>
<td>After1min of CPT</td>
<td>124±7.76</td>
<td>****</td>
<td>115.2±6.68</td>
<td>****</td>
<td>86.1±4.73</td>
<td>****</td>
<td>81.1±4.01</td>
<td>****</td>
<td>86.3±6.07</td>
</tr>
<tr>
<td>After5min of CPT</td>
<td>115.1±7.83</td>
<td>****</td>
<td>106.4±5.66</td>
<td>****</td>
<td>80.2±4.77</td>
<td>****</td>
<td>75.1±4.35</td>
<td>****</td>
<td>81.2±5.20</td>
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</tbody>
</table>

The values are expressed as means ± SD.
*P<0.05, **P<0.01, ***P<0.001, ****P<0.0001.

P values are comparisons between prerelaxation parameters and the effect of 61-PR on the parameters.

<table>
<thead>
<tr>
<th>Control</th>
<th>SBP</th>
<th>Prerelaxation</th>
<th>Postrelaxation</th>
<th>DBP</th>
<th>Prerelaxation</th>
<th>Postrelaxation</th>
<th>HR</th>
<th>Prerelaxation</th>
<th>Postrelaxation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resting</td>
<td>106.2±5.57</td>
<td>*104.2±4.54</td>
<td>73.3±6.20</td>
<td>71.1±6.65</td>
<td>76.9±4.14</td>
<td>74.4±3.03</td>
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</tr>
<tr>
<td>Immediately after CPT</td>
<td>121.2±6.03</td>
<td>**116.4±4.61</td>
<td>82.2±4.52</td>
<td>76.8±7.32</td>
<td>84.6±3.55</td>
<td>84.1±3.46</td>
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<tr>
<td>After1min of CPT</td>
<td>118.8±6.67</td>
<td>**111.6±6.16</td>
<td>79.3±6.04</td>
<td>74.8±7.58</td>
<td>83.1±3.19</td>
<td>81.7±3.38</td>
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<tr>
<td>After5min of CPT</td>
<td>107.1±5.59</td>
<td>**102.4±4.77</td>
<td>73.9±5.72</td>
<td>71.2±7.25</td>
<td>76.8±4.52</td>
<td>75.2±4.08</td>
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DISCUSSION

The results of 61-PR can be compared to reports available on various other relaxation techniques as they are fairly similar.

Significant differences in autonomic nervous activity have been found to exist between PMS and control women. Changes in HR and BP are the most important physiological responses following stress and have been reported to be higher during stress (11, 12).

The present study shows that the basal parameters of women, who suffered from PMS, were significantly higher than control subjects, indicating the presence of stress in them. Our results corroborate with the studies done by other researchers (11, 12, 14).

In our study, the SBP, DBP and HR immediately after CPT were significantly higher in PMS group than control group. The above data suggests that stress increases sympathetic component of autonomic nervous system. Marked sympathetic activity has been reported to occur in response to CPT which is used to assess the sympathetic activity. Earlier studies have suggested that there was a similar rise in all cardiorespiratory parameters on CPT and that basal SBP and DBP and the HR tend to show a rise on CPT (9, 15). Madanmohan et al studied in 2002 that HR is significantly increased after CPT. This increase in HR after immersion of hand in cold water is due to an increase in sympathetic activity with release of nor epinephrine and epinephrine (20).

Researchers now recommend relaxation techniques and psychotropic therapies to control HR and BP for women who are vulnerable to mental stress (16, 17). Benson et al showed that relaxation response reduces BP while Madanmohan et al (20) studied modulation of CPT-induced stress by shavasana wherein there was significant reduction in HR. This reduction can be explained on the basis of an increase in parasympathetic tone (18, 20). Similarly, in the present series, while on one hand CPT after 61-PR training showed a statistically significant fall in BP and HR of control subjects, on the other hand the relaxation induced decline of the said parameters in PMS group was statistically highly significant. The general decrement in CPT-induced rise in HR, SBP and DBP in both the groups is in concert with earlier proposition that 61-PR tilts the autonomic balance to parasympathetic dominance, which is more prominent when the subject is in stress as seen in PMS group (6).

It will be illogical to explain the results purely from viewpoint of sympathetic and parasympathetic activation per se. Future studies involving 61-PR must take into cognizance, the scarcity of scientific studies and it would necessitate monitoring of specific blood indicators during the period of premenstrual stress.

Conclusion

In the present study, outstanding effects were seen after CPT-induced stress on
subjects in premenstrual distress after one week training of 61-PR. Therefore, 61-PR can be prescribed to women suffering from PMS as an adjuvant to medical therapy.

ACKNOWLEDGEMENT

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REFERENCES