Efficacy of Modified Lamaze Technique on Gestational Hypertension

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Abstract

Background: Gestational Hypertension (GH) is the most frequent cause of hypertension during pregnancy. The rate ranges between 6% and 17% in healthy nulliparous women and between 2% and 4% in multiparous women.

Objectives: To estimate the effect of modified Lamaze technique on Gestational Hypertension (GH).

Methodology: Forty GH women participated in this study, their ages ranged from 25 to 35 years and body mass index not more than 35kg/m². They were randomly assigned into two groups equal in number as following: Group (A) (control group): (12 primigravidae and 8 multigravidae), they were subjected to regular antihypertensive treatment (methyldopa) and Group (B) (study group): (13 primigravidae and 7 multigravidae). They were watched videos for lamaze training classes but without their other partners then subjected to "modified Lamaze technique" in the form of deep breathing exercises (3 sessions per week for 6 weeks) aiming for relaxation plus the same regular antihypertensive treatment as in Group (A).

Results: Comparison between both Groups (A,B) showed statistically non significant difference at (SBP) as well as (DBP) and (PR) levels after 6 weeks of treatment (3 sessions/week) which in favor Group (B).

Conclusion: Modified Lamaze technique in the form of slow deep breathing exercises, relaxation and massage has a good effect on SBP as well as DBP and PR levels as a method which can control GH.

Key Words: GH – SBP – DBP – PR – Modified lamaze technique.

Introduction

GESTATIONAL Hypertension (GH) diagnosed in women whose Blood Pressure (BP) reaches ≥140/90mmHg for the first time during pregnancy (after 20 weeks gestation), but without proteinuria. BP normalizes by 12 weeks postpartum [1].

Several studies have found that pregnant hypertensive women, when compared with normotensive pregnant women, have been found to have higher BP response to isometric handgrip and cold pressor tests, while no significant BP differences were found in response to a standardized mental stressor, that means stress in pregnancy elevates maternal BP when it is already high due to pathological processes [2].

BP measurement is an important screening test used in obstetric care to detect or predict gestational hypertensive disorders [8].

Lamaze classes taught women conscious relaxation and controlled breathing to manage the pain of contractions, avoiding the need for drugs. In the early years, highly motivated couples attended lamaze classes, practicing controlled breathing and conscious relaxation in preparation for labor. The breathing was thought to be effective because it acted as a distraction, a focus away from the pain [4].

Previous studies have reported autonomic cardiovascular control alterations with different breathing patterns, which reflect the effect of ventilation on hemodynamics. Based on these results, breathing exercises and respiration control can be used as a treatment option for hypertension more than pharmacology. Breathing exercise programs in patients with hypertension, suggest that the resultant reduction in respiratory rate lowers BP by favorable modulation of cardiovascular reflexes [9].

The Lamaze method includes advanced breathing techniques. The method involves the use of deep and slow breaths that help to relax individuals by increasing oxygen and decreasing tension. The Lamaze method also includes deep breathing exercises, the use of a training coach (social support)
and visual focusing called focal point (meditation). Progressive muscle relaxation, another key element of the Lamaze technique, is a form of relaxation that aims to physically and mentally reduce body tension [5].

Breathing, as a form of relaxation, has been theorized to decrease pain perception. Breathing relaxation is a form of focused rhythmic breathing that has been shown to slow mental and physical activity in order to reduce responses of the sympathetic nervous system. The Lamaze method includes advanced breathing techniques. The method involves the use of deep and slow breaths that help to relax individuals by increasing oxygen and decreasing tension [5].

**Material and Methods**

This study was carried out on forty volunteers pregnant women suffering from GH. All patients were medically diagnosed by mercury sphygmomanometer, they were selected from the outpatient clinic of October 6 University Obstetrics and Gynecology from 2013-2014. They were randomly assigned into two groups equal in number. Control group (Group A): Consisted of 20 GH pregnant women (12 primigravidae and 8 multigravidae). Their ages ranged from 25 to 35 years. They were subjected to regular antihypertensive treatment. While, study group (Group B): Consisted of 20 GH pregnant women (13 primigravidae and 7 multigravidae). They were watched videos for lamaze training classes then subjected to "Modified Lamaze technique" in the form of deep breathing exercises, relaxation and massage (3 sessions per week for 6 weeks) each session lasting for 20 minutes aiming for relaxation, plus the same regular antihypertensive treatment as in Group (A).

**Inclusive criteria:** Their age ranged from 25-35 years old, their gestational age was exceeding 20 weeks’ gestation and their Body Mass Index (BMI) did not exceed 35kg/m².

**Exclusive criteria:** All pregnant women will be free from diabetes and/or cardiorespiratory diseases. Pregnant women suffering from repeated abortion as well as bleeding and intra uterine fetal growth anomalies or retardation or previous history of preterm labour, also women with twins will be excluded from this study. 

**Procedures:**

**Evaluative procedures:**

All patients in both Groups (A,B) were subjected to all of the following evaluation protocols:

1. Detailed medical history and physical examinations including vital signs as (SBP) as well as (DBP) which were measured by sphygmomanometer and stethoscope and (PR) which was measured by pulse oximeter before and after 6 weeks of treatment. Also anthropometric measurements are weight; height and BMI were evaluated before treatment only.

**Treatment procedures:**

Informed consent form will be signed by each patient in both Groups (A,B) before participating in the study.

The doses of antihypertensive drug (Methyl-dopa) in milligrams which were taken daily by each woman in both Groups (A) and (B).

**Modified Lamaze technique:** Before starting the first session of modified Lamaze technique, the procedure was explained to each pregnant woman in a short description about its justification and effectiveness to increase her interest and motivation as well as, to obtain her confidence and cooperation.

A videos for Lamaze classes were watched by participants aiming for education and to increase their interest and confidence.

Relaxation technique was performed in a suitable room which was wide, warm and quiet, with no bright light also equipped with a source of soft music.

The GH pregnant woman was asked to empty her bladder as well as, any restrictive clothes should be released before starting the session.

She was instructed to assume a comfortable half lying position on a firm surface with using pillows and cushions to accommodate her body curves. She was fully supported and her body parts were relaxed as well as, there was no muscle tension.

The instructor's voice was smooth, quiet and gradually reduced in volume as session progressed.

Then the measurement of arterial BP and PR were taken before starting her treatment session from the relaxed position she took.

After that, pregnant woman was instructed to perform the following modified Lamaze technique's guidelines:

1. Slow, deep breathing by teaching each woman the “right” way to breath. Breath-in from the
nose, focusing her concentration on her breath, thus feeling the movements of the air through the nostrils during inspiration as well as expiration.

2- They were taught to breath out from the mouth, pursed-lips abdominal breathing and were instructed to relax and breath comfortably without straining or putting any effort into her breathing or any change in its rhythm.

3- There are no rules related to how many breaths per minute, whether to make sounds. The key here is that the breathing is conscious, not automatic.

4- Focusing on something, either with eyes closed can help maintain the rhythm of breathing.

5- Using conscious breathing in everyday life, either to relieve stress or to increase body awareness and mindfulness.

6- Massage (efflurage) over head and neck, back, arms, hands, legs and feet (for 10 minutes).

Statistical analysis:
Statistical analysis was performed using paired t-test between pre and post within each group, in addition, independent t-test to compare between groups. A probability of \((p<0.05)\) was considered to be significant.

Results
The results obtained from both groups were calculated and compared.

Table (1): Physical characteristics (age, weight, height and BMI) of both Groups (A,B) showed a statistically non significant difference which denotes homogeneity of the groups.

<table>
<thead>
<tr>
<th>General Characteristics</th>
<th>Group A</th>
<th>Group B</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>Mean ±SD</td>
<td>Mean ±SD</td>
<td>t-value</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>29.15 ±1.43</td>
<td>29.51 ±1.44</td>
<td>0.788</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>78.14 ±3.48</td>
<td>79.97 ±3.42</td>
<td>1.67</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>29.68 ±2.11</td>
<td>29.95 ±2.37</td>
<td>0.385</td>
</tr>
</tbody>
</table>

*SD: Standard deviation. \(S\): Significance. \(p\): Probability. NS: Non-significant.

Table (2): Comparative analysis of SBP, DBP and PR were showed statistically non significant difference before treatment between both Groups (A,B). While, after end of treatment they showed statistically significant difference in SBP AND DBP but in PR it showed statistically non significant difference between both Groups (A,B).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>Before treatment</th>
<th>After treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBP (mmHg)</td>
<td>Group A</td>
<td>152.86±6.08</td>
<td>136.50±2.68</td>
</tr>
<tr>
<td></td>
<td>Group B</td>
<td>149.81±6.61</td>
<td>129.87±2.40</td>
</tr>
<tr>
<td>t-value</td>
<td>1.512</td>
<td>8.25</td>
<td></td>
</tr>
<tr>
<td>p-value</td>
<td>0.138</td>
<td>0.0001</td>
<td></td>
</tr>
<tr>
<td>Improvement percentage</td>
<td>10.70%</td>
<td>13.31%</td>
<td></td>
</tr>
</tbody>
</table>

| DBP (mmHg)  | Group A  | 106.85±2.85      | 95.98±4.81      |
|             | Group B  | 107.61±4.85      | 91.09±1.73      |
| t-value     | 0.600    | 6.02             |
| p-value     | 0.552    | 0.0001           |
| Improvement percentage | 10.17% | 15.35% |

| PR (beat/min) | Group A  | 87.76±3.57       | 75.84±10.32     |
|               | Group B  | 81.06±6.14       | 69.95±7.68      |
| t-value       | 2.12     | 2.05             |
| p-value       | 0.253    | 0.063            |
| Improvement percentage | 13.58% | 13.71% |

Fig. (1): Improvement percentage of SBP in group A.

Fig. (2): Improvement percentage of SBP in group B.
Discussion

There is a great need for a non-pharmacological treatment as an alternative or even complementary to the pharmacological treatment to reduce or stop the use of antihypertensive drugs. The present study was conducted to investigate the effect of Modified Lamaze technique on GH.

Breathing exercises is one of the non-pharmacological modalities. It is known that regular practice of breathing exercises increases parasympathetic tone, decreases sympathetic activity, improves cardiovascular and respiratory functions, decreases the effect of stress and strain on the body and improves physical and mental health [6].

Concerning the changes occurred in systolic BP, in Group (A) which was treated with methyldopa only and was considered as a control group, the results were showed a statistically significant decrease.

While in Group (B) which was treated with modified lamaze technique assisted by deep breathing exercises, relaxation, massage and methyldopa, the SBP and DBP were considered a statistical significant decrease.

These results were confirmed with the study of [6,7] which stated that there was a highly significant reduction in systolic and diastolic blood pressures in pregnant women with mild PE who received relaxation in the form of breathing exercise.

Slow breathing increases baroreflex sensitivity and reduces sympathetic activity and chemoreflex activation, it suggest a potentially beneficial effect in hypertension; where, baroreflex is the system in the body that regulates blood pressure by controlling heart rate, strength of heart contractions, and diameter of blood vessels. Slow breathing reduces blood pressure and enhances baroreflex sensitivity in hypertensive patients. These effects appear potentially beneficial in the management of hypertension [7].

Also these results come in agreement with [8] who determined that relaxation in the form of Mitchell’s simple physiological relaxation (as a
form of physical relaxation) technique was effective in treating mild hypertensive pregnant women who continued receiving their antihypertensive drug (methyldopa) all through the study. They reported a statistical significant decrease in systolic and diastolic blood pressures which equals a reduction of 14.3% and 7.85% respectively between before and after four weeks of treatment.

Also, it was found that a greater reduction in both systolic and diastolic BP, arterial pressure, heart rate and respiratory rate in mild and moderate pre-eclamptic patients who received Mitchell’s simple physiological relaxation (as a form of physical relaxation) technique and calcium supplementation 2gm/day [9].

Clinical trials documents reveal that slow abdominal breathing reduces BP, but there are also contradictory reports. This may be partly because abdominal breathing lacks homologous physiologic feedback [9].

Mourya et al., adopted that slow breathing had a stronger effect than fast breathing. BP decreased longitudinally over a 3-month period with both interventions. Accordingly both types of breathing exercises benefit patients with hypertension. However, improvement in both the sympathetic and parasympathetic reactivity may be the mechanism that is associated in those practicing the slow-breathing exercise [10].

Concerning PR, the results of this study showed a significant decrease in Group (A) and Group (B).

Regular practice of rhythmic slow breathing has been shown to increase baroreflex sensitivity and reduce chemoreflex activation, and to reduce systolic, diastolic and mean BP as well as heart rate variations in hypertensive patients [10].

So, the decrease in PR after practicing slow deep breathing technique in this study was in agreement with the results of Turankar et al., [10] who reported a significant reduction in PR, systolic and diastolic BP after using rhythmic slow deep breathing technique (pranayama) in the treatment of hypertensive patients. The results also agree with the results of previous studies in which the different relaxation techniques resulted in a highly significant reduction in heart rate in pre-eclamptic women. However, the decrease in PR could be attributed to the effect of relaxation in promoting parasympathetic action [9-11].

Finally, we can conclude that modified Lamaze technique showed a statistically significant reduction in systolic BP, diastolic BP and PR.

References

