

EFFECT OF PROGRESSIVE MUSCLE RELAXATION TECHNIQUE ON PAIN RELIEF DURING LABOR

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Abstract- Labor pain is a cause of stress and suffering; for which many women seek methods to relieve this pain. The aim of this study was to determine the effect of relaxation techniques on pain relief during labor. This study was carried out on 62 pregnant women referred to Fatemeh hospital (Hamadan, Iran) during their labor. They were selected using convenience sampling and were divided randomly in two groups. The first group (control) received routine way of ward during their labor and the second group (test) went through the relaxation technique after training. The intensity of pain was determined using a standard pain number rating scale, and the behavioral reactions were recorded using an observational checklist. The statistical analysis of data showed significant difference in intensity of pain between the two groups ($P = 0.0001$). Also there was a significant difference in behavioral reactions between the two groups ($P < 0.0001$). Since the relaxation technique is easy to perform and without any risk and also has low expenses it is recommended for pain relief during labor.

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INTRODUCTION

Labor and delivery are painful and worrisome events for many women (1, 2) and the fear of labor can make pregnancy, which is primarily a delightful event in life, a dreadful experience. The mentioned association of labor, a physiologic process, with acute pain is somewhat paradoxical (3) and is a cause of stress and suffering; for which many women seek for methods of pain relief (4). Wall and Malzack believe that pain must be relieved

effectively because severe and continuous pain accompanied with stress reactions have harmful effects on mother and probably the fetus and newborn (1).

Although the pain and stress can have harmful effects, there are several risks accompanied with the usage of anesthetic drugs. The anesthetic drugs which depress the mothers' central nervous system can also pass through the placenta and depress the fetus central nervous system. The other risk, common to all general anesthetic medicine, is the aspiration of the stomach content which obstructs the respiratory duct and may lead to death. According to a survey of literature done (1990-1997) in United States focusing on the death of mothers in health centers shows that 155 mothers have died from complications of anesthesia (5).

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For the above reasons, non-pharmacological measures have been used to reduce labor pain. However, these techniques which include bath touch and massage, and maternal movement and positioning have received limited attention in the medical literature (6, 7). Harkens and Dinker believe that the methods which cause relaxation in patients can also help to relieve muscular and emotional tension and reduce the labor pain. They may be also effective in pain control during labor (8).

The explanation for the pain control effect of these techniques is the prevention of nonessential tension in muscles during labor (9). The obtained relaxation or tension release is helpful in reducing pain. Additionally, the patient would also obtain greater relief from pain medication following relaxation. These physical techniques involve conscious relaxation of muscle groups. Sometimes the patient is instructed to first tighten and then release the muscles as a way of gaining greater insight into the feeling of tension versus relaxation (10).

Since controlled studies of non-pharmacological methods, particularly the progressive muscle relaxation technique, are limited and sometimes provide conflicting results, this study was designed and carried out to determine the effect of this technique in pain relief during labor.

MATERIALS AND METHODS

This study was a matched-pairs randomized clinical trial. Sixty-two pregnant women in the last weeks of pregnancy who referred to Fatemeh Hospital in Hamadan, west of Iran, in 2002 were selected by convenience sampling. They were allocated randomly into two groups, *i.e.* the test and the control groups containing 31 women in each group. These two groups were matched according to age, education and living place. All selected cases were between 20-30 years old, primiparous, educated and without any obstetric complication. The details of demographic information of the participants were recorded in a questionnaire containing 6 questions. Informed consent was obtained from all participants.

The details of the study and muscle relaxation technique were described to the test group using

lecture, dialogue, demonstration and educational leaflets. During labor the test group followed the instructions for relaxation under the supervision of one of the researchers, but the women in the the control group did their labor without any supervised relaxation and they followed the routine way of the ward. None of the subjects in both groups received analgesic before or during labor.

The muscle relaxation technique was carried out according to a standard method (10, 11). Briefly, the subjects were positioned in a comfortable state and quiet environment and began by tensing and relaxing the toes and feet and then ankles, calves, knees, thighs, lower abdomen, upper abdomen (or chest), shoulders, arms, hand and fingers, neck, face and heads. These directions were given slowly, one body area at a time, with a short interruption between each directed relaxation.

A standard pain number rating scale was used to assess the severity of pain (10). This scale had 10 divisions with 0 being pain free and 10 being the intolerable pain, and it was described to all participants. This scale was shown to all subjects and they were asked to choose a figure that showed their pain. The intensity of pain was expressed as low (1-4), mild (5-6), severe (7-8), and very severe (9, 10). To collect data, the intensity of pain was measured during the first phase of labor (latent phase, *i.e.* dilatation 3) and once in active phase (dilatation 7) and once in second phase of labor (dilatation 10) in both groups. During these periods the observed behavioral effects were also recorded using an observational checklist. Behavioral indicators of the effects of pain were included: vocalizations (moaning, crying, screaming and gasping), facial expressions (grimace, clenched teeth, wrinkled forehead, tightly closed or opened eyes or mouth, lip biting) and body movement (restlessness, immobilization, increased hand and finger movements, rhythmic or rubbing motions).

To show the difference in number of observed behavioral effects between the two groups the results were expressed as: without difference (0), low difference (1 and 2), mild difference (3 and 4) and high difference (5 and 6).

Statistical analysis of data was performed using the descriptive statistics and paired *t* test.

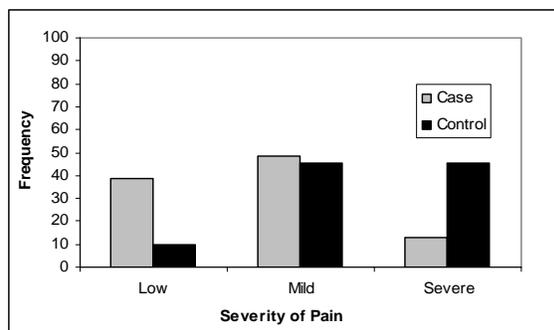


Fig. 1. Relative frequencies of subjects in test and control groups based on the level of pain in latent phase of labor.

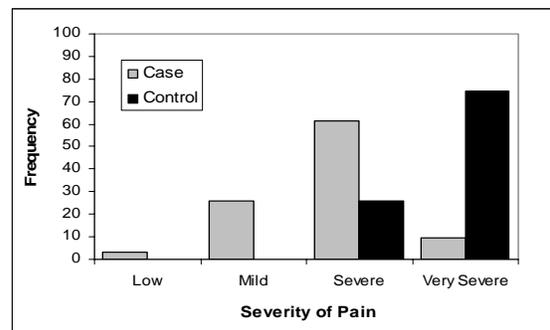


Fig. 3. Relative frequencies of subjects in test and control groups based on the level of pain in active phase of labor.

RESULTS

The level of pain in test and control groups during latent phase is shown in Fig. 1. As this figure shows in latent phase 12.9% of subjects in test group had severe pain (score 7-8), but in control group 45.16% of cases had the same grade of pain. The mean of severity of pain in this phase in control and test group was 6.25 and 4.6, respectively, and the difference between the two groups was statistically significant ($P = 0.001$, $df = 30$, $T = 13.1$). The difference in behavioral reactions in these two groups is also shown in Fig. 2. The mean number of the observed behavioral reactions in control group was 3.77 and that of test group was 2.0. Statistical analysis showed significant differences between the numbers of observed behavioral reaction in these two groups ($P = 0.0001$, $df = 30$, $T = 14.77$). Similarly in active phase of labor only 9.7% of cases in test group had very severe pain (score 9-10), compared to 74.8% of cases in control group (Fig 3). The mean of pain level in this phase in test group was lower than that of control group (7.03 vs. 9.12),

and the difference was statistically significant ($P = 0.0001$ $df = 30$, $T = 15.64$). The mean number of the observed behavioral reactions in control group was 5.54 and that of test group was 2.41 in active phase of labor. Statistical analysis showed significant difference between the two groups ($P = 0.001$, $df = 30$, $T = 14.77$). The difference between behavioral reactions in this phase is shown in figure 2.

In the second phase of labor, most of the cases in test group (64.5%) had mild pain (score 5-6) (Fig 4). The mean of pain level in this phase in test and control groups was 6.96 and 9.64, respectively. The result of paired t test analysis showed that these differences in the severity of pain between the two groups were statistically significant ($P < 0.0001$ $df = 30$, $T = 15.78$). Regarding behavioral reactions caused by pain, a difference was observed between the two groups (Fig 2). The mean number of the observed behavioral reactions in control group was 5.32 and that of test group was 2.25 in active phase of labor. Statistical analysis showed significant differences between the two groups ($P < 0.0001$, $df = 30$, $T = 19.13$).

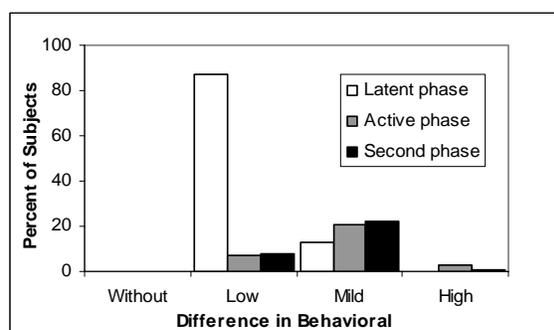


Fig. 2. Difference in behavioral reaction between test and control groups in latent, active and second phase of labor.

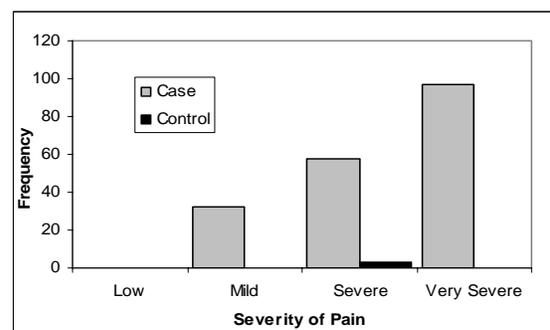


Fig. 4. Relative frequencies of subjects in test and control groups based on the level of pain in second phase of labor.

DISCUSSION

The results obtained from this study showed that in latent phase of labor, relaxation technique can reduce the pain of labor. Similar results were obtained in active phase of labor. Based on these data it was shown that in dilatation 3 and 7 cm, relaxation reduced the pain. Other investigators, using the non-pharmacological technique of transcutaneous electrical nerve stimulation (TENS), showed that TENS was also effective in pain relief and it can be used up to dilatation of 6 cm (12). These results were similar to those obtained from our study, however relaxation is much easier and there is no need for any particular equipment.

In the second phase of labor, our results confirmed that relaxation can relieve the pain and the extent of pain relief was quite different from those women who did not do relaxation. In the other studies, TENS was not found to be effective in reduction of pain in this phase (12). Green *et al.* also used the relaxation technique in women in southeast England and showed that those who did relaxation during the labor were satisfied from this technique (13). In a similar work, another group of investigators showed that following relaxation the stress level of the majority of studied women decreased (14). It is known that reduction in stress causes pain relief (4). The difference in observed behavioral reactions between the two groups during different phases of labor also confirmed that relaxation was effective in pain relief throughout labor.

It can be concluded that relaxation technique is effective in pain relief in all phases of labor and can reduce the stress during labor; therefore, it can be recommended for pregnant women. Since the performance of this technique is easy and there is no associated risk, it would be acceptable and satisfactory for pregnant women.

Conflict of interests

We have no conflict of interests.

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