

Warm shower aspersion, perineal exercises with Swiss ball and pain in labor

Banho quente de aspensão, exercícios perineais com bola suíça e dor no trabalho de parto

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Keywords

Obstetrical nursing; Nursing care; Clinical nursing research; Labor pain; Hydrotherapy; Exercise therapy; Baths

Descritores

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Abstract

Objective: To evaluate, in an isolated and combined manner, the use of warm aspersion bath and perineal exercises performed with Swiss ball during labor, facing pain perception.

Methods: This is a clinical or intervention study. We recruited 15 pregnant women at low obstetric risk who accepted the use of non-pharmacological interventions for pain relief and who also accepted being questioned about their perception of pain using a visual analogue scale.

Results: When the interventions studied were associated, pain reduction was significant. There was no significant difference in pain scores, when interventions were isolated.

Conclusion: The results indicate that the associated use of non-pharmacological methods for pain relief, warm aspersion bath and perineal exercises with the Swiss ball during the dilation phase is related to the reduction of pain and promotion of the parturient's comfort when associated.

Resumo

Objetivo: Avaliar de forma isolada e combinada a utilização do banho quente de aspensão e exercícios perineais realizados com bola suíça durante o trabalho de parto e a percepção da dor.

Métodos: Estudo clínico experimental ou de intervenção, randomizado. Foram recrutadas 15 parturientes de baixo risco obstétrico que aceitaram utilizar intervenções não farmacológicas para alívio da dor e questionadas sobre a percepção dolorosa, utilizando a aplicação da escala analógica visual.

Resultados: Quando as intervenções em estudo foram associadas a diminuição da dor foi significativa. Não houve diferença significativa no escore de dor, quando as intervenções foram isoladas.

Conclusão: Os resultados indicam que a utilização associada dos métodos não farmacológicos para alívio da dor, banho quente de aspensão e exercícios perineais com a bola suíça durante a fase de dilatação está relacionada com a redução da dor da parturiente e promoção do conforto materno, quando associados.

Clinical Trials Registry: The Universal Trial Number (UTN) is U1111-1142-1103 (Protocol)

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Introduction

The pain of labor is interpreted in different ways by women, being influenced by many factors such as culture, family history, anxiety, fear, and previous experience or social group to which they belong. An important contribution in assisting the parturient is to provide conditions so that she can endure the pain and discomfort caused by uterine contractions during parturition process.

The use of the warm aspersion bath and perineal exercises with the Swiss ball constitutes non-pharmacological methods for pain relief during labor, much used in our field in order to promote relaxation and comfort for the parturient, assisting in the progression of delivery and reduce the use of analgesia, thus contributing to building a model of obstetrical care. These are methods that may be used in isolation or combined in obstetric practice.⁽¹⁻³⁾

The warm bath is a noninvasive cutaneous stimulation strategy of superficial heat, which associated with intensity and application time produces effects locally, regionally and generally, reason why it is considered complementary and alternative treatment in obstetrics. These baths are conducted at an average temperature of 37°C, which is positively associated with the pain relief and anxiety during labor to reduce the levels of neuroendocrine hormones related to stress, it also improves the pattern of contractions and consequent correction of uterine dystocia.^(1,4)

The use of the Swiss ball in labor, rubber object, pressurized inflatable, widely used in physiotherapy sessions for physical therapy and neurological treatment, allows the adoption of the upright, seated and with a slight pelvic rocking position, it also works muscles of the pelvic floor, specifically the pubococcygeus and levator ani, and the fascia of the pelvis. The parturient will have freedom of movement, will do perineal exercises and as a result will be actively participating in the process of childbirth as it may facilitate the descent and rotation of the fetal. Studies show that there is improvement in uterine blood flow, making contractions more effective and it also helps in cervical dilation.^(2,5)

Cervical dilatation is a parameter that can be used for pain assessment and the adoption of some method of relief. Being considered mild pain when less than 5 cm and moderate to severe pain when greater than 5 cm.⁽⁶⁾

Pain during the first stage of labor is related to nociceptive stimuli transmitted by the fibers A-delta and C from pelvic structures of both visceral as somatic origin, related to the uterine cervix, vagina and perineum muscles. As labor progresses the pain impulses are transmitted from T10 in the beginning, until S4, in the end, when the pain becomes more intense and more diffuse, which explains its progression, forming an upward curve as approaches the expulsion period.⁽⁶⁾

The use of visual analog scale (VAS) assists in assessing or measuring the intensity of pain reported by the woman, which is described as appropriate for assessing acute pain. VAS may also be considered a method to express severe pain.⁽⁷⁻¹⁰⁾

Pain has an important biological function, indicating some disturbance in the body; however, it is advocated by adherents to natural childbirth as a function of relevance to the maternal emotional well-being and psychophysiological development of the newborn. However, when prolonged, it can cause deleterious effects on the binomial, enhancing body's response to stress, neuroendocrine and metabolic changes that may have an effect on ventilation, circulation and basic acid balance.⁽⁶⁾

Considering the importance of the use of interventions that contribute to pain relief in labor in order to collaborate with changes in attitudes and not interventionist behaviors and thus encourage natural childbirth to be inserted in government programs and policies with regard to delivery care in our country, this study aims to assess, in an isolated and combined manner, the use of the warm aspersion bath and perineal exercises performed with Swiss ball during labor process facing the perception of pain reported by women.

The aim of this study was to assess, in an isolated and combined manner, the use of the warm aspersion bath and perineal exercises performed with Swiss ball during labor process facing pain perception.

Methods

This is a clinical trial or intervention study, randomized and blind with pre-test and post-test using repeated measures. We recruited 15 pregnant women at low obstetric risk who accepted non-pharmacological interventions for pain relief and who also agreed on being questioned about pain perception during labor, for the last purpose, we used the application of the visual analogue scale (VAS). The study was conducted in the city of Sao Paulo, in a natural birth center inside-hospital linked to the Unified Health System (SUS), assisted by obstetric nurses and supporting medical staff. Data collection occurred in March and April 2010.

The inclusion criteria were: the absence of clinical and/or obstetric pathologies, completion of, at least, six prenatal visits, being in the active phase of labor, which means - two to three efficient uterine contractions in ten minutes and cervical dilation with a minimum of three centimeters, gestational age between 37 and 42 completed weeks calculated from the date of the last menstrual period and/or the result of early ultrasound (up to 20 weeks), pregnant women with a single fetus alive in vertex presentation, demonstration score up to five in the pain visual analog scale in the randomization process.

The exclusion criteria were: indication for cesarean section at admission, presence of analgesia during labor.

For randomization, interventions were identified from 1 to 15, comprising three groups of five patients randomly. The parturients in group 1 received as a non-pharmacological intervention a warm water aspersion bath, those in group 2 had the Swiss ball exercise for the perineum and group 3 both interventions bath and Swiss ball simultaneously.

The bath water was held at a temperature of 37°C, temperature was measured with a digital waterproof thermometer, brand Akso, the position the parturient held was chosen by her, sitting or standing, with sprinkling directed to her lumbosacral region for 30 minutes. The perineal exercise with Swiss ball of 65 cm in diameter was performed with the mother sitting, legs bent at 90 degrees, conduct-

ing movements of pelvic thrust and rotation for 30 minutes. Combined interventions were the warm aspersion bath directed to the lumbosacral region, sitting on a Swiss ball with flexed leg at an angle of 90°, performing rotation and pelvic thrust during the same period.

The Visual Analog Scale (VAS) for measuring pain is an instrument for measuring pain intensity used before and one hour after the intervention. This consists of a 10 cm ruler punctuated from 0 to 10 in which 0 is located on the extreme left and corresponds to the complete absence of pain and the far right 10 is maximum bearable pain by the individual. On this scale, it is possible to quantify mild/moderate pain score ranging from 0-5, and moderate to severe pain score of 5-10, as recommended by the International Association for the Study of Pain.⁽¹⁰⁾

The calculation was performed between paired samples and the data were statistically analyzed using t test, parametric test to analyze the statistical difference between dependent samples from the same size, where each individual is their own control (before and after). In this case the data should be measured at interval or reasons level. This test is intended to small samples ($n < 31$), but can also be used for large samples.

We assumed 95% confidence interval. For numeric variables was presented central tendency (median) measures and the inter-quartiles values. As the data showed a non-normal distribution, we used the Wilcoxon test to assess whether the groups had similar data.

To assess pain behavior, correlation analysis was performed, where values closer to one indicate high correlation and values near to zero assume bad or nonexistent correlation.

The study followed the development of national and international standards of ethics in research involving humans.

Results

The analysis of the description of the pain scores reported by the parturients before and after interven-

Table 1. Description of scores of pain in the moments before and after the interventions

Moments	Cases	Minimum	25%	Median	75%	Maximum	z	p-value
Before	15	8	9	10	10	10	3,00764	0,0026
After 1 hour	15	5	7	8	9	10		

Table 2. Description of scores of pain for non-pharmacological interventions

Intervention	Cases	Minimum	25%	Median	75%	Maximum	z	p-value
Warm bath							-1,44842	0,1475
Before	5	9	9	10	10	10		
After 1 hour	5	6	6,5	9	9,5	10		
Swiss Ball							-1,09545	0,2733
Before	5	8	8,5	10	10	10		
After 1 hour	5	7	7,5	9	9,5	10		
Warm bath and Swiss ball							-2,43193	0,0150
Before	5	8	8,5	9	10	10		
After 1 hour	5	5	5,5	7	7,5	8		

tion indicate that was a significant decrease between the two periods (p-value = 0.0026) (Table 1).

When only one intervention was used, the values indicate that no significant difference in pain score between the moments for the therapy of warm bath (p-value = 0.1475). However, it can be seen that among the three interventions, p-values are lower when related to the use of hot bath alone (Table 2).

When the exercise intervention, sitting on the Swiss ball was used alone, values indicate that there was no significant decrease in pain score between the moments for exercise therapy with Swiss ball (p-value = 0.2733).

When the two interventions were associated, warm aspersion bath sitting on the Swiss ball, values reveal a significant decrease in the pain score between the moments pre and post therapy (p-value = 0.0150).

Discussion

The non-pharmacological options for pain relief during labor are diverse, such as warm bath, perineal exercises with Swiss ball, breathing exercises,

relaxation, massage, acupuncture, electrical stimulation, subcutaneous injection of distilled water, among others. These practices offer comfort and allow freedom of choice on the part of parturients.⁽³⁾

For the World Health Organization it is essential that non-pharmacological methods for pain relief are used because they are safer and less invasive.⁽¹¹⁾

The study demonstrated that the use of non-pharmacological interventions for pain relief during labor significantly reduced the pain score of the parturient (p = 0.0026).

When analyzed separately, interventions of warm aspersion bath and perineal exercise with the Swiss ball had no significant difference (p= 0.1475 and p= 0.2733, respectively). However, when used together showed significance, with significant reduction in the pain score (p = 0.0150).

The values found suggest that the use of warm aspersion bath is more effective to reduce the pain compared to the use of Swiss ball alone. However, when there was an association of the methods, it was observed they were more efficient and effective in reducing pain (p= 0.1475 , p= 0.2733 , p =0.0150 , respectively).

The warm bath either aspersion or immersion, is a widely used method for the care during labor process. It favors obstetric care that enables critical reflection on the intervention model.⁽¹²⁾

The potential action of hydrotherapy is to reverse the negative effects such as anxiety and pain during labor by promoting relaxation response, by depressing the sympathetic nervous system, as a consequence the decrease in levels of catecholamine.⁽¹³⁾

Overall, the intervention of warm bath is very well accepted by women during labor, as demonstrated in a study conducted in Belgium with 110 pregnant women, of which 90% requested the repetition of the intervention in their active phase.⁽¹⁴⁾

In a Brazilian study conducted in Rio Grande do Norte with women hospitalized in a Humanized Birth Unit which also received non-pharmacological interventions during the active phase of labor, such as breathing exercises, muscle relaxation, massage lumbosacral in a combined manner, and aspersion bath in an isolated manner, when comparing the mean pain intensity pre and post-intervention, effectiveness was verified in pain relief.⁽⁹⁾

In our field, a randomized study of 108 pregnant women also showed that the warm bath is a good option to offer pain relief without interfering with the progression of labor or conditions of the newborn.⁽¹⁵⁾

In a systematic review with 3,146 parturient who had used the warm bath, suggested that this practice reduces the use of epidural analgesia and offers no adverse effects to the mother and fetus.⁽³⁾

The use of the warm bath during labor promotes relaxation and reduces pain, anxiety and stress-related parameters, without the risks caused by other treatments.^(1,13-15)

This phenomenon is explained by the fact that stimulation of pain receptors goes through the spine to the brain where the response is direct. The signals generated by the warm bath stimulate epidermal thermoreceptors to reach the brain faster than the pain receptor sent, effectively blocking transmission, thus the perception of pain. The heat enhances blood circulation calming stress-induced contractions in contact with some tissues, it improves metabolism and elasticity decreasing pain threshold.⁽¹⁶⁾

Study on the effects of the warm bath therapy revealed that anxiety decreased significantly in the group as a whole. However, there was a greater reduction in pain in the group of women with higher basal levels of 5 compared with women with baseline levels lower than this value. This reduction was mirrored in the serum levels of the hormone cortisol. Comparison of baseline pain and plasma cortisol levels in women with high levels of subjective pain suggests a strong relationship between pain and stress caused by it. Thus, the warm bath therapy can be highly effective in providing stress relief.⁽¹⁾

Another benefit of using the warm bath is in relation to duration of time of labor. Some researchers suggest the possibility of its use in shorten labor. In a study of 160 pregnant women, the control group consisted of 72 women and 88 to experimental cervical dilatation of 5 cm at baseline for both groups, there was a significantly higher rate of cervical dilatation among women who had made this intervention (2.5 cm/hour) when compared with those who did not use the warm bath (1.2 cm/hour), with no statistical difference in the total duration of labor.⁽¹⁷⁾

Corroborating with this result, a study by Taiwan obstetric nurses with experimental and control group using the aspersion bath at a temperature of 37°C in the first stage of labor reveals that there was a significant reduction in its duration, which is opposite to other international studies using the same strategy.⁽¹⁶⁾

Another widely used practice of comfort is the Swiss ball, considered an alternative for postural freedom and active participation of women during labor.

The study reveals that the isolated use of the Swiss ball showed no significant results, however, when used in combination with the bath, there was a significant reduction in the pain score, reducing thus the stress and anxiety of the parturient.

The Swiss ball is an adjuvant therapy as strategy for reducing pain and promotes the evolution of labor process. Exercises with the Swiss ball demonstrated significant efficacy in reducing pain and evolution during labor. However, its use as a non-pharmacological method in obstetric practice is often grounded in empirical observation of the results, since there are not enough clinical studies to support its use.^(18,19)

A Study conducted by obstetric nurses who researched the use of the Swiss ball during labor in 35 institutions enrolled in the National Health System of the Municipality of Sao Paulo showed that 100% of natural birth centers and 40% of obstetric centers used this resource as method for obstetric assistance during the dilation phase. This research showed that the use of the Swiss ball in the active phase of labor is more effective and can shorten the period of dilation.⁽²⁾

The care the obstetric nurse provides is an important factor, as it enables the use of non-interventionist practices and non-pharmacological while conducting the labor and attention to the situation of the woman in labor pain.

The methods adopted by nurses during labor promote the reduction of maternal stress and act as adjuvants of the physiologic vertical position relative to the supine position, since this position can be related to poor blood circulation, causing hypotension, changes of the uterine circulation with involvement of contractions pattern making them inefficient leading to uterine dystocia and possible fetal distress, increasing the chances of operative delivery.^(1,2)

The explanation for the benefits obtained by using the Swiss ball during labor lies in the fact that the vertical position allow the force of gravity associated with proper axis alignment of fetal and maternal pelvis, promotes fetal descent and progression in the delivery channel. In this sense, the effects of maternal position and movement during labor may relate to the reduction of pain in the lumbar region, facilitating maternal-fetal circulation, increase the intensity of uterine contractions, decreasing the length of labor, assisting in descent and fetal presentation as well as decrease the rates of perineal trauma and episiotomy. In this context, the use of the Swiss ball allows a woman to take different positions.^(19,20)

Conclusion

The study concludes that the use of non-pharmacological interventions for pain relief during the active phase of labor, as the aspersion bath in isolation

and the use of the bath with the Swiss ball in combination reduced the score of pain referred by the patients, both interventions combined promoted relaxation and decreased anxiety.

Both strategies showed to be safe practices, promoted the comfort and welfare to parturient and their use should be encouraged.

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Collaborations

Barbieri M contributed to the project design, analysis, interpretation of data, revising it critically for important intellectual content and final approval of the version to be published. Henry AJ collaborated with the project design, drafting the article and revising it critically for important intellectual content. Chors FM participated in the design, analysis and interpretation of data. Maia NL cooperated with the project design and data interpretation. Gabrielloni MC contributed to the project design, analysis, interpretation of data and revising it critically for important intellectual content.

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