

Massage reduced severity of pain during labour: a randomised trial

Rubneide Barreto Silva Gallo¹, Licia Santos Santana¹, Cristine Homsy Jorge Ferreira², Alessandra Cristina Marcolin¹, Omero Benedicto PoliNeto³, Geraldo Duarte¹ and Silvana Maria Quintana¹

¹Department of Gynecology and Obstetrics, ²Department of Health Sciences Applied to the Locomotor Apparatus, ³Department of Surgery and Anatomy Faculty of Medicine of Ribeirão Preto, University of São Paulo, Ribeirão Preto/SP, Brazil

Question: Does massage relieve pain in the active phase of labour? **Design:** Randomised trial with concealed allocation, assessor blinding for some outcomes, and intention-to-treat analysis. **Participants:** 46 women pregnant at ≥ 37 weeks gestation with a single fetus, with spontaneous onset of labour, 4–5 cm of cervical dilation, intact ovular membranes, and no use of medication after admission to hospital. **Intervention:** Experimental group participants received a 30-min lumbar massage by a physiotherapist during the active phase of labour. A physiotherapist attended control group participants for the same period but only answered questions. Both groups received routine perinatal care. **Outcome measures:** The primary outcome was pain severity measured on a 100 mm visual analogue scale. Secondary outcomes included the Short Form McGill Pain Questionnaire, pain location, and time to analgesic medication use. After labour, a blinded researcher also recorded duration of labour, route of delivery, neonatal outcomes, and the participant's satisfaction with the physiotherapist during labour. **Results:** At the end of the intervention, pain severity was 52 mm (SD 20) in the experimental group and 72 mm (SD 15) in control group, which was significantly different with a mean difference of 20 mm (95% CI 10 to 31). The groups did not differ significantly on the other pain-related outcome measures. Obstetric outcomes were also similar between the groups except the duration of labour, which was 6.8 hr (SD 1.6) in the experimental group and 5.7 hr (SD 1.5) in the control group, mean difference 1.1 hr (95% CI 0.2 to 2.0). Patients in both groups were satisfied with the care provided by the physiotherapist. **Conclusion:** Massage reduced the severity of pain in labour, despite not changing its characteristics and location. **Trial registration:** NCT01392053. [Gallo RBS, Santana LS, Ferreira CHJ, Marcolin AC, PoliNeto OB, Duarte G, Quintana SM (2013) Massage reduced severity of pain during labour: a randomised trial. *Journal of Physiotherapy* 59: 109–116]

Key words: Randomised controlled trial, Labor pain, Massage, Parturition, Obstetric labor

Introduction

Various techniques have been proposed to relieve labour pain including massage therapy, which, in addition to promoting pain relief, provides physical contact with the parturient, potentiating the effect of relaxation and reducing emotional stress (Kimber et al 2008, Field 2010, Simkin and Bolding 2004). Several theories have been proposed to explain the mechanism by which massage might relieve pain, such as a reduction in cortisol and norepinephrine levels (Chang et al 2002, Field 2010, Nabb et al 2006), an increase in serotonin levels (Field 1998), the stimulation of endorphin release and of the circulation with a consequent increased oxygen supply for the tissues, and the facilitation of toxin excretion through the lymphatic system (Zwelling et al 2006). In addition, Melzack and Wall (1965) proposed a mechanism whereby the noxious stimuli evoked by lesions are regulated in the spinal cord by nerve cells that act as gates, preventing or facilitating the passage of impulses to the brain.

Some studies have demonstrated the efficacy of massage during labour. In the USA, Field et al (1997) observed that a group of women who received massages during labour presented a less depressed mood, lower levels of pain, stress and anxiety, and more positive facial expressions. Chang et al (2002) conducted another study on massage throughout the active phase of labour and detected a gradual increase in pain and anxiety in the control and experimental

groups, with lower pain scores during the three phases in the experimental group, and a lower anxiety score only in the first phase, as observed using a visual analogue scale. Kimber et al (2008) compared three groups of parturients; one group received massage combined with a relaxation technique, another received music therapy, and a control group received the usual maternity care. The authors observed a tendency toward a reduction in pain in the massage group, although the difference from the other two groups was not statistically significant.

A recent Cochrane systematic review (Smith et al 2012) included six articles involving 326 women and showed that massage may have a significant role in reducing pain and

What is already known on this topic: Several trials have identified that massage reduces the amount of pain and anxiety experienced during the first stage of labour. However, a systematic review indicates that these trials are at moderate or greater risk of bias and pooling their results leads to an imprecise estimate of the effect of massage on pain during labour.

What this study adds: Thirty minutes of massage during labour reduced the amount of pain experienced at the end of the massage significantly, although the characteristics and location of the pain did not change.

improving the emotional experience of labour. However, the pooled data from four trials involving 225 women that examined the effect of massage on pain generated a standardised mean difference of -0.82 (95% CI -0.47 to -1.17). This demonstrates that the true effect could be either a small-to-moderate effect or a very large effect. Also, among these trials, only one used concealed allocation and only one registered a study protocol. Therefore, although several reports demonstrate that massage reduces pain, further well-designed clinical trials using this modality applied in a directed and sequential manner for pain relief during labour are indicated. Therefore, the research questions for this study were:

1. Does massage relieve pain in the active phase of labour?
2. Does massage change the characteristics and location of the pain?
3. Does massage influence obstetric and newborn outcomes?
4. Are women in labour satisfied with the presence of a physiotherapist to provide massage?

Method

Design

This was a randomised trial with concealed allocation, assessor blinding of some outcomes, and intention-to-treat analysis. After meeting the eligibility criteria for the study, participants were randomly allocated by the primary researcher to an experimental group or a control group according to a computer-generated random allocation list. During the period of 4–5 cm of cervical dilation with uterine contractions, participants in the experimental group received massage for 30 min by the primary researcher. A secondary researcher remained blinded to group allocations and was never present while the experimental or control procedures were performed by the primary researcher. The secondary researcher recorded each participant's responses regarding the pain severity, location, and characteristics immediately before and immediately after the intervention. Blinding was maintained by the secondary researcher leaving the room after assessing the pain-related outcomes at baseline, and returning to reassess the same outcomes after the intervention. After labour and before hospital discharge, the secondary researcher collected the data regarding obstetric and neonatal outcomes, and also recorded the opinion of the participants regarding the presence of the physiotherapist during the study period.

Participants, therapists, and centres

Participants were recruited from the women admitted to the Reference Center of Women's Health of Ribeirão Preto-MATER, state of São Paulo, Brazil, between September 2009 and May 2010. This is a 40-bed unit that serves a mean of 3600 patients per year in Brazil's public health system.

The inclusion criteria were: primigravida, a single fetus in cephalic position, low-risk pregnancy, at least 37 weeks of gestation, the spontaneous onset of labour, cervical dilation of 4–5 cm with appropriate uterine dynamics for this phase, no use of medication from admission to hospital until randomisation, the absence of cognitive or psychiatric problems, intact ovular membranes, literacy, and with no associated risk factors. The main exclusion criterion was the presence of dermatologic conditions that would

contraindicate the application of massage. Participants were free to withdraw from the study if they were intolerant of the allocated intervention or if they declined further participation at any stage.

The two therapists involved in the intervention and data collection had both specialised in women's health since early 2008. Although the standardisation of the methods for evaluating the pain in labour should have minimised any interference of the researcher, the therapists took the same role, ie, the primary researcher conducted randomisation and the application of the study interventions (massage or routine care), while the secondary researcher conducted the measurement of outcomes.

Intervention

The experimental group received massage from a physiotherapist (the primary researcher) at the beginning of the active phase of labour, during the period of 4–5 cm of cervical dilation and during uterine contractions for 30 minutes. The intensity of the massage was determined by the participant, who was instructed to request greater or lesser force during execution of the massage according to her preference. The technique was applied between T10 and S4, which corresponds to the path of the hypogastric plexus and the pudendal nerve, responsible for innervation of the paravertebral ganglia, delivery canal, and perineum. The massage consisted of rhythmic, ascending, kneading hand movements and a return with sliding through the lateral region of the trunk in association with sacral pressure. The participants were also instructed to choose their preferred position for receiving massage, ie, sitting, lateral decubitus, or standing with the trunk bending forward. This group also received other routine maternity ward care, discussed further below.

The control group received the same routine maternity ward care. In addition, the same primary researcher accompanied participants in the control group for 30 minutes during the period of 4–5 cm of cervical dilation, as done for the massage group, although the investigator was there merely for observation and to answer questions.

The routine care of the maternity ward during the period of dilation is based on the recommendations of the World Health Organization (WHO 1985) for more humanised childbirth. After admission to the hospital, a meal was offered to the participants and resources for pain relief were permitted, if requested by the participant. Such resources include labour analgesia and oxytocin when necessary. The parturient was allowed to choose the most comfortable position. The presence of an accompanying person was permitted during labour and delivery as well as during any other medical procedures.

Outcome measures

Primary outcome: The primary outcome was the change in pain severity at the end of the intervention period. To measure this, pain severity was marked by the participant on a 0–100 mm visual analogue scale at the beginning and end of the intervention period. We considered 13 mm to be a clinically relevant reduction in acute pain (Bernstein et al 2006, Gallagher et al 2001, Todd et al 1996).

Secondary outcomes: The characteristics of the pain during labour were assessed using the Short-Form McGill Pain

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