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### Scientific and Technological Research

# Analgesic efficacy of two concentrations of bupivacaine in women in labor: Randomized, controlled, triple blind clinical trial<sup>☆</sup>



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#### ABSTRACT

**Introduction:** Epidural analgesia is the safest and most effective method for the treatment of pain during childbirth. Epidural bupivacaine provides excellent analgesia for labor and remains the most widely used local anesthetic in obstetric anesthesia.

**Objective:** To evaluate the analgesic efficacy of two concentrations of bupivacaine in women in labor.

**Methods:** 114 patients in labor with term pregnancy were included in the study. They were grouped randomly into two groups: patients who received bupivacaine at 0.125% (group A) and those who received 0.25% bupivacaine (group B). Patients in group A received a bolus injection of 10 ml of 0.125% bupivacaine. The patients in group B received a bolus of 10 ml bupivacaine 0.25%. Pain intensity according to VAS, blood pressure, heart rate, respiratory rate, and the degree of motor block was assessed using the Bromage scale at different periods of time.

**Results:** Demographic characteristics and parity were compared with no statistically significant differences found. By comparing the values of the VAS measure at 0, 15, 30, 60 and 90 min, statistically significant differences in favor of the group with 0.25% bupivacaine were found with decreased pain perception after 30 min,  $p$ -value = 0.02. No differences in arterial pressure, heart rate and respiratory rate were found between the two groups.

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Conclusion: The concentration of 0.25% bupivacaine has greater analgesic efficacy compared to 0.125% bupivacaine.

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## Eficacia analgésica entre dos concentraciones de Bupivacaína en mujeres en trabajo de parto. Ensayo clínico controlado aleatorizado triple ciego

### R E S U M E N

#### Palabras clave:

Dolor  
Analgésia, Epidural  
Bupivacaína  
Trabajo de parto

**Introducción:** La analgesia epidural es el método más seguro y eficaz para el tratamiento del dolor del parto. La Bupivacaína epidural proporciona una analgesia excelente para el parto y sigue siendo el anestésico local más utilizado en anestesia obstétrica.

**Objetivo:** Evaluar la eficacia analgésica entre dos concentraciones de Bupivacaína en mujeres en trabajo de parto.

**Métodos:** Se incluyeron 114 pacientes en trabajo de parto con embarazo de término. Se agruparon de forma aleatoria en dos grupos; pacientes que recibieron Bupivacaína al 0,125% (grupo A) y Bupivacaína al 0,25% (grupo B). Las pacientes del grupo A recibieron 10 ml de Bupivacaína al 0,125% en bolo. Las pacientes del grupo B recibieron 10 ml. de Bupivacaína al 0,25% en bolo. Se valoró la intensidad del dolor según la EVA, la presión arterial, frecuencia cardíaca, frecuencia respiratoria, el grado de bloqueo motor según la escala de Bromage en diferentes periodos de tiempo.

**Resultados:** Las características demográficas y de paridad se compararon, sin encontrar diferencias estadísticamente significativas. Al comparar los valores de la EVA medida en el minuto 0, 15, 30, 60 y 90 se encontraron diferencias estadísticamente significativas a favor del grupo con Bupivacaína al 0,25% con disminución de la percepción del dolor a partir del minuto 30, valor de  $p$  de 0,02. No se encontraron diferencias en la Presión Arterial, frecuencia cardíaca y frecuencia respiratoria entre ambos grupos.

**Conclusión:** La concentración de Bupivacaína al 0,25% mejora la eficacia analgésica en comparación con Bupivacaína al 0,125% en mujeres con trabajo de parto activo en 6 puntos a los a partir de los 60 minutos.

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## Introduction

Pregnancy and childbirth are among the main reasons for care in hospitals around the world<sup>1</sup>. Pain during childbirth is conditioned by uterine contractility, which, in turn, is modulated by the secretion of endogenous catecholamines that activate beta-2 adrenergic receptors<sup>2</sup>, causing the sensation of pain<sup>3</sup>.

Apart from being an unpleasant feeling, pain causes anguish and stress and limits cooperation during labor<sup>4</sup>, which may end in a reduction of fetoplacental flow leading to fetal acidosis.

The Visual Analog Scale (EVA) is a validated, subjective, and widely used tool to stratify the intensity of patient pain perception<sup>5</sup>.

In 1847, James Young Simpson was the first to use ether for analgesia during childbirth<sup>6</sup>. Currently, neuraxial analgesia is the most used procedure and its benefits are widely known<sup>7</sup>. The most used pharmaceuticals are ropivacaine and bupivacaine in different concentrations<sup>8,9</sup>. Bupivacaine is preferred because of its greater affinity for plasmatic proteins in

pregnant women<sup>10</sup>, although cardiotoxic properties have been attributed to it since it affects calcium channels. However, in low concentrations, it is far from causing this cardiotoxic effect<sup>11</sup>.

There is scientific evidence regarding the use of low dosages of epidural analgesia compared to high doses or combined analgesia ( $p < 0.05$ ), such as the Comparative Obstetric Mobile Epidural Trial (COMET)<sup>12</sup> from the Study Group in the United Kingdom. In this study, the results of different concentrations of anesthetics, like bupivacaine and ropivacaine, in epidural anesthesia during labor are compared, along with their relationship with the incidence of assisted vaginal childbirth, and their effect at a variety of doses. Nevertheless, there is no evidence of the efficacy for pain management of the use of different concentrations of a single local anesthetic, in this case bupivacaine, in patients undergoing childbirth<sup>13,14</sup>.

## Objective

To assess the analgesic efficacy (VAS) between two concentrations of bupivacaine in women in labor.

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