Use of epidural analgesia versus intracutaneous injection of sterile water for pain relief in the first stage of labor

Thesis
Submitted for the partial fulfillment of
Master degree in Obstetrics and Gnecology

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2010

Acknowledgment

First of all, I would like to thank...**ALLAH** who granted me the strength to accomplish this work.

Words do fail to express my deepest gratitude and appreciation to **Prof. Dr. Alaa Eldin Hamed El-Feky** Professor of Obstetrics and Gynecology Faculty of Medicine Ain Shams University for his unique effort, considerable help, assistance and knowledge he offered me through out the performance of this work. I consider myself fortunate to work under his supervision.

I am also deeply grateful and would like to express my sincere thanks and gratitude to **Prof. Dr. Fekeria Ahamed Salama** Professor of Obstetrics and Gynecology Faculty of Medicine Ain Shams University for her most valuable advises and support all through the work and for dedicating much of her precious time to accomplish this work.

Special thanks are extended to **Dr. Amr Abd Al-Aziz El-Sayed** lecturer of Obstetrics and Gynecology Faculty of Medicine Ain Shams University for great help and continuous contributions and great effort during the whole period of the study.

Great thankfulness to the staff members and residents of Anesthesiology, Obstetrics and Gynecology Departments Faculty of Medicine Ain Shams University for their great contributions.

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WHO World Health Organization

δ Delta

ADH Anti diuretic hormone

PSIS Posterior superior iliac spine

TENS Transcutaneous Electrical Nerve Stimulation

N2O Nitrous oxide

PCEA Patient- controlled epidural analgesia

CEI Continuous epidural infusion

ACOG American College of Obstetricians and Gynecologists

FHR Fetal heart rate

CTG Cardiotocography

CSA Continuous spinal analgesia

CSEA Combined spinal–epidural analgesia.

Vs. Versus

VAS Visual analog scale

G.A Gestational Age

RCTs Randomized controlled trials

LDI Low -dose epidural infusion

HDI High- dose epidural infusion

CS Cesarean section

IV Intravenous injection

Min Minute

S	Seconds
SC	Subcutaneous
NaCl	Isotonic Saline Solution

Introduction

Pain is defined as unpleasant sensory and emotional experience associated with either actual or potential tissue damage or described in terms of such damage **(Morgan et al., 2005)**. Labor pain might be categorized as nociceptive pain (**Woolf, 2004)**. Most women rate pain of childbirth as the most painful experience of their lives (**Eisenach, 2004**).

Labor pain includes components that differ completely from pain in general. It is the result of natural events and has a special meaning, leading in most cases to something extremely positive, the birth of a healthy child. When labor starts, the pain is a signal for the woman to prepare herself for coming events and to find a safe place for giving birth. The birthing woman can prepare herself well in different ways before delivery to manage labor pain **(Moore, 1997; Sweet, 2004).**

It has been demonstrated that very intense pain and the consequent stress on the mother can have a negative effect on the progression of labor and on the health of the fetus. In fact, if the pain is particularly intense and/or if labor is protracted, the pain induces an adrenergic stimulus, which increases arterial pressure and cardiac load. Moreover, the hyperventilation

caused by contractions leads to hypocapnia and then to uteroplacental vasoconstriction, with consequent reduction of blood afflux to the fetus. This is followed by hypoventilation with resultant maternal and fetal hypoxemia **(Pace et al., 2004)**

According to WHO's (World Health Organization) declaration issued in 2001, every pregnant woman has the right to request painless labor - one of fundamental human rights **(Suljevic et al., 2009**)**.**

The aim of labor analgesia is to soothe anxiety and pain in the mother, while simultaneously guaranteeing the physiological progression of labor, reduced onset of obstetric complications, and maximum well-being of the maternal–fetal unit **(American Society Of Anesthesiologists, 1999)**. The ideal analgesic should be safe for the mother and newborn, and provides flexibility in changing conditions **(Wong, 2009a)**. Additionally, the ideal technique should provide long-lasting, consistent analgesia titrated to individual parturient's needs, with minimal or no risk, no undesirable maternal or fetal side effects, and with minimal physician input and cost **(Wong, 2009b)**.

An understanding of labor pain in a multidimensional framework provides the basis for a woman-centered approach to labor pain management that includes a broad range of

pharmacologic and nonpharmacologic intervention strategies (**Lowe, 1996**). The most common pharmacological methods currently in use are Entonox and epidural analgesia (**Martensson and Wallin, 2006**). Nonpharmacologic methods include continuous labor support, baths, intradermal water blocks, acupuncture, massage, transcutaneous electrical nerve stimulation, and hypnosis (**Simkin and Bolding, 2004**).

Currently, the procedure that meets all these requisites is epidural analgesia, which eliminates pain, while leaving unaltered all other faculties of the mother, including motor function, of fundamental importance in delivery, and guaranteeing the mother's full collaboration and participation in the birthing experience **(Pace et al., 2004)**. It maintains the patient's sense of touch, facilitating participation in the birth process and improving maternal satisfaction during labor and delivery (**Reynolds et al., 2002**). Epidural is regarded as the 'the gold standard' for labor analgesia and thus the method of choice for intolerable pain. The use of epidural analgesia is not without consequence and is associated with increased frequency of instrumental delivery (forceps or vacuum) (**Anim-Somuah et al., 2005**) and some degree of motor weakness in the parturient. Supplementation of local anesthetics with opiates lessens motor blockade, but may be associated with opiate side effects, such

as nausea, pruritus, urinary retention and respiratory depression (**Eltzschig et al., 2003**). The most frequent complications of epidural block in obstetrics include dural puncture, vascular placement, hypotension and insufficient block (**Gomar and Fernandez, 2000**). Also in many clinical situations, epidural is not available and alternative analgesic methods have to be used. Epidural analgesia may be contraindicated for medical reasons, undesired by the parturient or skilled anesthetic personnel may not be available. For these reasons among others, some women prefer to avoid the use of regional analgesia (**Hutton et al., 2009**).

Sterile water injected lateral to the lumbosacral spine is a simple approach to ameliorating the visceral pain of labor including that of back labor. This approach is easy to administer, inexpensive, has minor side-effects and can be administered without specialist care. Intracutaneous Sterile water injection is associated with acute somatic pain that lasts for 30 seconds, but as the pain of the injections subsides, so does the visceral referred pain of the low back. The effect begins quickly and has been shown to be effective for 2 to 3 hours; long after the acute pain of the injection has subsided (**Huntley et al., 2004**).