Use of antispasmodic Drotaverine Hydrochloride to shorten the duration of labor in nulliparous women

A thesis

Submitted for partial fulfillment of
Master Degree in
Obstetrics and Gynecology

By

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2013

Acknowledgment

First of all, praise and thanks to beneficial and merciful ALLAH who guided me and gave me strength and patience to excute this thesis

My deepest gratitude and sincerest appreciation to ***Prof. Hazem Ameen Al-Zeeniny****, Professor of Obstetrics and Gynecology, Faculty of Medicine, Ain Shams University for his continuous encouragement, enlightening and helpful advices, that helped me throughout this work. I am greatly indebted to him and much grateful for his consistent supervision and valuable suggestions.*

I feel greatly indebted to ***Dr. Moustafa Ibrahim Ibrahim,*** *Assistant Professor in Obstetrics & Gynecology, Faculty of Medicine, Ain Shams University, for his dynamic efforts, trustful help, sincere guidance and continuous support and assistance without which this work would have never seen the light.*

I can't forget to thank ***Dr. Ahmed Husseiny Salama,*** *Lecturer in Obstetrics & Gynecology, Faculty of Medicine, Ain Shams University, for his assistance and guidance through this work.*

Special thanks to ***Dr. Mohamed Ibrahem Ellaithy,*** *Lecturer in Obstetrics & Gynecology, Faulty of Medicine, Ain Shams University, for his valuable scientific advice and his kind assistance throughout the study.*

I am also deeply indebted to all ***Patients*** *who participated in our study. Finally I feel grateful towards all my fellow* ***Colleagues*** *in the Obstetrics and Gynecology Department, Faculty of Medicine, Ain Shams University, for all the help they offered.*

Mohammed Abdel-Hameed Abdel-Latif

بسم الله الرحمن الرحيم

وَأَنْزَلَ اللهُ
عَلَيْكَ الْكِتَابَ
والْحِكْمَةَ
وَعَلَّمَكَ مَا لَمْ
تَكُنْ تَعْلَمُ
وَكَانَ فَضْلُ
اللهِ عَلَيْكَ
عَظِيمًا

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رسالة

توطئة للحصول على درجة الماجستير

في أمراض النساء والتوليد

مقدم من

طبيب /**محمد عبدالحميد عبداللطيف**

بكالوريوس الطب والجراحة- كلية طب سوهاج - 2002

طبيب مقيم بقسم النساء والتوليد بمستشفى سوهاج التعليمى

تحت إشراف

ا.د /حازم أمين الزنينى

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كلية الطب – جامعة عين شمس

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كلية الطب – جامعة عين شمس

كلية الطب

جامعة عين شمس

2013

Introduction

Labor is defined as the onset of regular contractions and cervical change. It is traditionally divided into three stages. The first stage encompasses the onset of labor to the complete dilatation of the cervix, and is subdivided into latent and active phases. The active phase begins when the rate of cervical dilatation accelerates, which occurs at 4 cm on average. The second stage consists of the time from complete dilatation of the cervix to delivery of the infant. The third stage is complete at the delivery of the placenta. The original labor curves were plotted by Friedman in the 1950s and are the traditional basis for defining prolonged labor patterns ***(Friedman, 1978).***

The uterine cervix serves as a channel through which the fetus must pass during labor. At approximately 38 weeks of pregnancy, especially in multiparous women, the diameter of the endocervical canal at the level of the external Os is 1-2cm. The cervix dilates to 10cm to allow the passage of the fetus. Cervical tissue has considerable elasticity during labor. It consists of smooth muscle and fibrous connective tissue, which can be influenced by drugs to accelerate cervical ripening ***(Leppert, 1995)***.

First labor is significantly more painful during labor than

subsequent births; this difference may reflect physical changes in the birth canal resulting from a previous delivery. Nulliparous women generally experience more pain during early labor, while multiparous women may experience more pain during the late first stage and the second stage of labor, as a result of rapid fetal decent ***(Sheiner et al., 1998)***.

There are many options for assessing pain. The simplest approach is to note the presence or absence of pain before and after an intervention. Other methods of pain assessment include observation of physiological and behavioral changes or to use self-reporting scales such as a Verbal Rating Scale (VRS) and visual analogue scale (VAS) ***(Reynold, 2000).***

The other scale which is commonly used to describe the intensity of pain and how much pain the patient is feeling include also the pain face scale, and the numerical rating scale. On the numerical rating scale, the person is asking to identify how much pain they are having by choosing a number from 0 (no pain) to 10 (the worst pain imaginable). As regard the pain face scale, it includes six faces with different expressions on each face and the patient is asked to choose the face that best describes how she is feeling ***(Whaley and Wong, 1988).***

Subjective self reporting methods are the most commonly employed. The VAS is a measurement instrument

that rises to measure a characteristic or attitude that is believed to range across a continuum of values and cannot easily be directly measured. Operationally, VAS is usually horizontal line, one hundred millimeters in length, anchored by word descriptors at each end. The patient marks on the line the point they feel represents their perceptions of their current state. It has proved to be reliable and valid, and its relative simplicity allows it to be explained and used even when the parturient is in severe pain ***(Wewers and Love, 1990)***.

Adequate analgesia during labor has a positive influence on the course of labor ***(Keskin et al., 2002)***.

The ideal obstetric analgesic should provide potent analgesic efficacy with minimal maternal and neonatal adverse effects ***(Bricker and Lavaender, 2002)***.

Reducing the length of labor is a highly desirable goal of intrapartum care, both from a perspective of maternal and fetal wellbeing, and for the providers of the birth services. Avoiding along, protracted labor entails shorter exposure to pain, anxiety and stress and would thus translate into a major improvement in maternal satisfaction with the childbirth experience ***(Cheng et al., 2010).***

Moreover, although a clear point where incidences of perinatal morbidities sharply rise has not yet been identified, a

prolonged first stage of labor has been shown to be associated with higher odds of neonatal admission to the neonatal intensive care unit ***(Waldenstrom et al., 1996).***

When necessary obstetrician use cervical ripening agents to decrease the duration of labor. Intravaginal misoprostol (prostaglandin E1 analogue) and dinoprostone (prostaglandin E2) are the most commonly used agents for effective cervical ripening ***(Hofmeyr and Gulmezoglu, 1999)***.

Based on the premise that shortening the length of labor is beneficial, interventions aimed at accelerating the progression of labor have been introduced routinely as part of standard labor management and care throughout the 20th century. Certain labor-accelerative procedures, such as amniotomy, became common practice and have been put to the acid test of randomized control trials to evaluate their efficacy ***(Wei et al., 2009).***

Use of anticholinergics/antispasmodics as a method of augmenting labor was first described in 1937 by Hirsch ***(Hirsch, 1937)***, who reported a decrease in labor length by two to four hours following Intrapartum administration of an atropine-like drug (Syntropan®), mainly among older nulliparas ***(Clark and Shires, 1940).***

Since then, the popularity of antispasmodics for reducing the duration of labor has varied over time, becoming a routine obstetric intervention in many maternity units throughout the Western world and in parts of the developing world ***(Guerressi et al., 1981).***

Smooth muscle relaxants are well accepted in progression of labor. Apart from uterine contraction, cervical dilatation is an important factor; which determines the duration of labor. It is the resistant of all driving forces of uterine contraction against passive tissue resistance. Smooth muscle relaxants inhibit impulses in the form of spasm that impairs the effective cervical dilatation. Various agents have been used to combat cervical muscle spasm. ***(Sharma et al., 2001).***

Blasko found that type IV phosphodiesterase enzyme is present in increased concentration in the 3rd trimester in myometrium suggesting its contribution in regulating uterine motility. Hence like drotaverine selective phosphodiesterase IV inhibitors may help to facilitate dilatation of cervix ***(Blasko, 1998).***

Drotaverine, an isoquinolone derivative is a superior smooth muscle relaxant which acts specifically on spastic sites

and corrects the cAMP and calcium balance relieving smooth muscle spasm. ***(Gupta, 1999).***

This inhibitory action is detected only in lower uterine segment during labor since muscle fibers in upper uterine segment are strongly affected by contractile effect of oxytocin. Use of drotaverine during pregnancy is free of any teratogenic and embryotoxic effects ***(Czeizel, 1996).***

Objectives

The purpose of this study was to determine the effectiveness of Drotaverine for reducing the duration of labor for the context of contemporary practice, among nulliparous women managed according to a standard intrapartum protocol.