COMPARATIVE STUDY BETWEEN THE ACTIVE MANAGEMENT OF LABOUR VERSUS ROUTINE CARE

Thesis

Submitted for the Partial Fulfillment of the Master Degree in ***Obstetrics and Gynecology***

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2010


بسم الله الرحمن الرحيم
وَأَنْزَلَ اللهُ
عَلَيْكَ الْكِتَابَ
والْحِكْمَةَ
وَعَلَّمَكَ مَا لَمْ
تَكُنْ تَعْلَمُ
وَكَانَ فَضْلُ
اللهِ عَلَيْكَ
عَظِيمًا
صدق الله العظيم
سورة النساء آية
(١١٣)

First thanks to **ALLAH** *to whom I relate any success in achieving any work in my life.*

I wish to express my deepest thanks, gratitude and appreciation to Prof. Dr. Abass Abdel Salam Ghazy, Professor of Obstetrics & Gynecology for his meticulous supervision, kind guidance, valuable instructions and generous help.

Special thanks are due to Prof. Dr. Khaled Saiid Moussa, Professor of Obstetrics & Gynecology for his sincere efforts, fruitful encouragement.

I am deeply thankful to Dr. Noha Hamed Rabei, Assistant Professor of Obstetrics & Gynecology for her great help, outstanding support, active participation and guidance.

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List of Abbreviations

AC	*Adenosine channel*
ACOG	*American College of Obstetrician and Gynecologists*
ATP	*Adenosine triphosphate*
CPD	*Cephalopelvic disproportion*
CS	*Caesarean section*
CTG	*Cardiotocography*
GC	*Gaunosine channel*
HSS	*Hyperstimulation syndrome*
IUFD	*Intra-uterine foetal death*
IUGR	*Intra-uterine growth retardation*
MLCK	*Myosine light chain kinase*
NICU	*Neonatal, intensive care unit admission*
PPH	*Postpartum haemorrhage*
PROM	*Premature rupture of membranes*
VOC	*Voltage operated channels*

INTRODUCTION

The active management of labour, first introduced by O'Driscoll et al in the 1960 at the National Maternity Hospital in Dublin, Ireland ***(O'Driscoll, 1969)*** is a group of interventions initially devised to ensure short labour in nulliparous women. In addition, active management of labour was noted to be associated with a lower cesarean section rate ***(O' Driscoll et al., 1984)*** which was thought to be due to a decrease in the number of cesarean deliveries performed for dystocia ***(Lopez et al., 1992).***

The active management of labour refers to active control, rather than passive observation, over the course of labour by the obstetric provider. There are three essential elements to active management:

- Careful diagnosis of labour by strict criteria.
- Constant monitoring of labour with specific standards for normal progression.
- Prompt intervention (eg, amniotomy, high dose oxytocin) according to established guidelines if progress is unsatisfactory ***(O' Driscoll et al., 1973)***.

Active management of labour has two main components that prove critical to its success. One is the organization component which is the most important. The

patients are educated on both the approach and expectations of the active management of labour ***(Impey et al., 1999)***.

The other component of the active management of labour is the medical component .First the candidates of active management of labour are nulliparous patients with uncomplicated term gestations with a fetus in the cephalic presentation. Second the patients are not admitted to the hospital and delivery unit unless they meet strict diagnosis of labour. Admission is contingent on the onset of painful regular uterine contraction with complete cervical effacement, bloody show with or without rupture of membranes ***(Boylan, 1989).***

A policy of early amniotomy seemed to reduce labour duration from between 60 to 120 minutes ***(Fraser et al., 2000).***

The next step in the active management of labour is to monitor closely the patient's progress to an institutional partogram. Once the diagnosis of labour is made the patient must progress 1cm/h based on cervical examination performed every 1 to 2 hours. If cervical dilation does not progress at the rate, then the diagnosis of dystocia is made. The support for using the rate was derived from a normogram created by Studd in 1973 ***(Ritchie, 1980)***.

After amniotomy, oxytocin is infused to correct dystocia. In active management of labour, oxytocin is infused in a protocol starting at the equivalent of 6m iu/min and increased by 6 m iu/15 min. up to maximum 40m iu/min until there are seven contractions per 15 min ***(Socol et al., 1999).***

Twelve hours were believed to be the maximum safe duration of spontanous labour and if delivery was not eminent after artificial rupture of membrane and oxytocin administration, cesarean section was considered ***(O'Driscoll et al., 1984)***.

AIM OF THE WORK

The aim of the present study is to compare the outcome of the active management of labour in term primigravida versus spontaneous vaginal delivery.

Chapter (1)

NORMAL LABOR

Labor refers to the chain of physiologic events that allows a term fetus to undertake its journey from the uterus to the outside world ***(Liao et al., 2005).*** It is achieved with changes in the biochemical connective tissue and with gradual effacement and dilatation of the uterine cervix as a result of rhythmic uterine contractions of sufficient frequency, intensity, and duration ***(Norwitz et al., 2003).*** The onset of labor is defined as regular, painful uterine contractions resulting in progressive cervical effacement and dilatation; cervical dilatation in the absence of uterine contraction suggests cervical insufficiency, whereas uterine contraction without cervical change does not meet the definition of labor ***(Cheng et al., 2009).***

Uterine phases of parturition:

Parturition encompasses all physiological processes involved in birthing: the prelude to, the preparation for, the process of, and the parturient recovery from childbirth. Parturition can be divided into four uterine phases which correspond to the major physiological transitions of myometrium and cervix during pregnancy ***(MacDonald & Casey, 1996).***

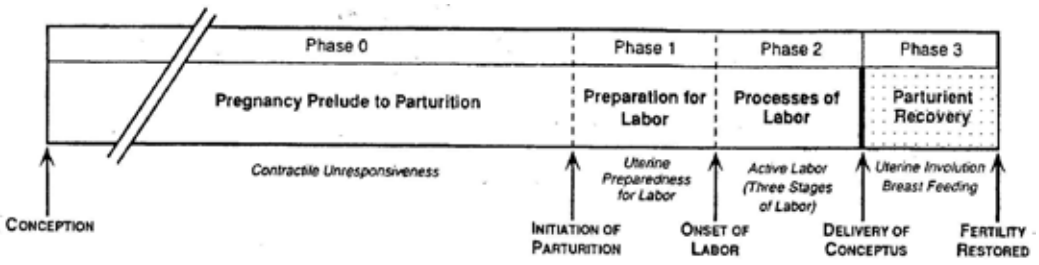

Fig. (1): Uterine phases of parturition ***(Cunningham et al., 2005 a).***

Phase (0): Uterine of quiescence:

It is a remarkably effective period of myometrial quiescence that is imposed on the uterus which is characterized by myometrial smooth muscle tranquility with maintenance of cervical structural integrity ***(MacDonald, 1993)***.

During this phase the myometrium is rendered unresponsive to natural stimuli and relative contractile paralysis is imposed against a host of mechanical and chemical challenges that otherwise would promote emptying of uterine contents while the cervix remains firm and unyielding which is essential to the success of phase 0 of parturition ***(Iams et al., 1996).***

Phase (1): Preparation of labor:

It is the time of uterine awakening in which the uterine tranquility of phase 0 of parturition must be suspended leading to morphological and functional changes

in myometrium and cervix to prepare the uterus for labor. Although the body of the uterus and cervix are parts of the same organ but must respond in quite different ways during pregnancy and parturition. On the one hand, it is essential that the myometrium be dilatable but remains quiescent. On the other hand, the cervix must remain unyielding and reasonably rigid. Coincident with the initiation of parturition, however, the cervix must soften, yield, and become more readily dilatable. The body must be transformed from the relatively, unresponsive organ characteristic of most of pregnancy to one that will produce effective contractions that drive the fetus through the yielding (dilatable) cervix ***(Challis & Lye, 1994).***

During this phase myometrium shows specific modification in uterine function with the suspension of the uterine phase 0 as:

1) A striking - 50 fold or more increase in the number of myometrial oxytocin receptors.
2) An increase in uterine contractile responsiveness to oxytocin and to other uterotonins.
3) An increase in gap junctions between myometrial cells before the onset of labor, continue to increase during labor, and then decrease quickly after delivery.

4) Transition from a contractile state characterized predominantly by occasional painless contractions to one in which more frequent contractions develop.
5) Formation of the lower uterine segment associated with descent of the fetal head to or even through the maternal inlet of the pelvis, a distinctive event referred to as lightening.

(Fuchs et al., 1982)

As regard the cervix, it shows cervical softening associated with two complementary changes which are collagen breakdown and rearrangement of the collagen fibers associated with alterations in the relative amounts of the various glycosaminoglycans. Near term, there is a striking increase in the relative amount of hyaluronic acid in cervix, with a concomitant decrease in dermatan sulfate. This hyaluronic acid is associated with the capacity of a tissue to retain water ***(Winkler & Rath, 1999).***

Biochemistry of uterine contractions:

The uterine smooth muscle cells contain bundles of filaments of actin and myosin. Myosin is made up of two heavy and four light polypeptide chains. The two heavy chains form the head of the protein that is the place of interaction with actin, whereas the light chains provide sites for phosphorylation and calcium binding. When a