

Delayed Labour: risk factors use of oxytocin and outcomes

Akademisk avhandling

Som för avläggande av filosofie doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentlig försvaras i sal Arvid Carlsson, Academicum, Medicinargatan 3, den 21 september 2018, klockan 09.00

av Lotta Selin

Fakultetsopponent:

Professor Ingegerd Hildingsson

Institutionen för kvinnors och barns hälsa, Uppsala universitet, Sverige

Avhandlingen baseras på följande delarbeten

- I. Selin L, Wallin G, Berg M. Dystocia in labour – risk factors, management and outcome: a retrospective observational study in a Swedish setting.
Acta Obstetrica et Gynecologica. 2008;87:216-221.
- II. Selin L, Almström E, Wallin G, Berg M.
Use and abuse of oxytocin for augmentation of labor.
Acta Obstetrica et Gynecologica. 2009; 88:1352-1357.
- III. Selin L, Wennerholm U-B, Jonsson M, Dencker A, Begley C, Wallin G, Wiberg-Itzel E, Almström E, Petzold M, Berg M.
High-dose versus low-dose of oxytocin for labour augmentation: a randomised controlled trial. *Submitted*
- IV. Selin L, Berg M, Wennerholm U-B, Dencker A.
Women's childbirth experiences in relation to dosage of oxytocin for augmentation of labour: a randomised controlled trial. *Manuscript*.

Delayed Labour: risk factors use of oxytocin and outcomes

Lotta Selin, Institute of Health and Care Sciences, Sahlgrenska Academy at University of Gothenburg, Sweden

ABSTRACT

Background and aim: Delayed labour refers to progress that is slower than what is considered normal and the most common cause of delayed progress is inadequate uterine contractions. It primarily affects nulliparous women and is associated with childbirth complications and negative birth experiences, both of which can have an impact on future pregnancy and labour. Delayed labour is one of the main reasons for the overall increase in the rate of caesarean section (CS) in nulliparous women. Infusion with synthetic oxytocin is a treatment commonly used to enhance uterine contractions in delayed labour, with the aim of achieving a spontaneous vaginal birth. Despite widespread oxytocin use, no consensus exists regarding the dosage. Together with an increase in the use of oxytocin to accelerate labour progress, the incidence of CS due to delayed labour is steadily increasing. The overall aim of the studies in this thesis was to investigate risk factors, the use of oxytocin and outcomes related to a delayed labour progress.

Methods: Two data collections (Studies 1 and 2) were performed, resulting in Papers I-IV. The first two papers (I-II) were based on a retrospective observational study (Study 1) in which 2,000 birth records from 2000-2001 were scrutinised. In Paper I, both nulliparous and multiparous women with a spontaneous or induced onset of labour were included. Risk factors for delayed labour, frequency of interventions and outcomes were analysed in 1,480 women. In Paper II, oxytocin use in 1,263 nulliparous and multiparous women with spontaneous onset of labour was analysed further. Multiparous women without previous vaginal delivery (n=35) were excluded. Papers III and IV were based on a double-blind, randomised, controlled trial (RCT) (Study 2) in which infusion with a high dose of oxytocin was compared with a low dose for augmentation of delayed labour in nulliparous women with spontaneous onset of labour. The hypothesis was that a high-dose regimen, compared with a low-dose regimen, would reduce the number of CSs without negative maternal and neonatal outcomes. In Paper IV, experiences of childbirth and of labour pain in the two randomised groups were compared via the Childbirth Experience Questionnaire (CEQ) sent out one month after birth. The primary outcomes were CS rate (Paper III) and childbirth experience measured with the three domains of the CEQ: Own capacity; Perceived safety; and Participation (Paper IV).

Results: Delayed labour occurred in 21% of all births and the main observed risk factors were nulliparity and multiparity without previous vaginal birth, epidural analgesia (EDA), gestational age ≥ 42 weeks and birth weight $> 4,000$ grams (*Paper I*). Among nulliparous and multiparous women with spontaneous onset of labour, oxytocin was administered in 72.8% and 38.1 % respectively, but, for the majority, the criteria indicating delayed labour were not met. Oxytocin augmentation was also undertaken in an unstructured manner. The frequency of operative births (instrumental vaginal birth and CS) in nulliparous women was higher for oxytocin recipients with delayed labour than for oxytocin recipients without delayed labour (40.9% versus 13.6%; $p < 0.001$) (*Paper II*). Augmentation with a high dose of oxytocin did not lower the CS rate in nulliparous women with spontaneous onset of labour, compared with a low dose, despite a higher total dose and higher dose increment. More events with tachysystole together with signs of fetal distress occurred with a high-dose regimen, but there were no differences in neonatal outcomes. (*Paper III*). Childbirth experiences in the three domains did not differ between the randomised groups but were associated with mode of birth (*Paper IV*).

Conclusion: The retrospective observational study found that nulliparous women ran an increased risk of delayed labour and operative birth (instrumental vaginal birth and CS). Multiparity without previous vaginal birth was also a risk factor for delayed labour and CS. As a result, a CS in a first birth might increase the risk of delayed labour and operative birth in a following labour. Oxytocin augmentation was used in an incorrect manner, both in excessive doses and by administration “too early or too late”. The RCT showed that a high dose of oxytocin was not superior to a low dose in terms of intrapartum CS outcome. As more tachysystole together with suspicious or pathological fetal heart rate occurred with a high-dose regimen and childbirth experience did not differ between the high- and low-dose groups, a low-dose oxytocin regimen is recommended for the treatment of augmentation of labour.

Keywords: delayed labour, oxytocin use, caesarean section, childbirth experiences