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Intravenous Oxytocin for Induction of Labour in High Risk Pregnancies

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Abstract: **Background: Labour induction might be shown by therapeutic or obstetrical intricacies particularly in high risk pregnancy such as post-term pregnancy Oxytocin is the commonest induction agent used worldwide. It has been used alone, in combination with other agents.**
Objective: This study was aimed to determine, from the best available evidence, the effectiveness and safety of intravenous oxytocin alone for induction of labour in high risk pregnancies, this review will assess the advantage and disadvantage of this procedure and highlight the most important evidence in for each section.
Methodology: We conducted a comprehensive literature search of the English language literature using Medline and the Cochrane Database of Systematic Reviews. The search covered the period until July 2016.
Conclusion: oxytocin is the most common agent used for labour induction, delivered by an intravenous infusion titrated to uterine contraction strength and frequency. oxytocin seems to be a safe method of inducing labour. Compared to waiting to see whether labour starts naturally (expectant management), giving oxytocin led to more women having their babies within 24 hours. Comparison of oxytocin with any other agents which induce labour at high risk pregnancy.

Keywords: **Intravenous Oxytocin.**

1. INTRODUCTION

The incidence of labour induction has increased over the last decade [(1)]. Since the 1980s, rates of induction of labour have relentlessly expanded. Induction at present happens for right around 24% of babies conceived somewhere around 37 and 41 weeks of gestation in the USA. Rates of induction have likewise expanded for preterm gestations [(2)] .In a large United States survey involving 1573 women with singleton gestations, 41% of respondents reported undergoing attempted medical induction of labour [(3)].

Labour induction might be shown by therapeutic or obstetrical intricacies particularly in high risk pregnancy such as post-term pregnancy, oligohydramnios, suspected intrauterine growth restriction (IUGR) and fetal gastroschisis, to minimise maternal morbidity, as with maternal cardiac disease and pre-eclampsia/eclampsia, or to benefit both mother and fetus as with prelabour rupture of membranes (PROM) at term and fetal macrosomia. Induction labour iin past specified cases might be supported to lessen fetal or neonatal horribleness and mortality. A few variables may impact the decision of technique for induction of work including cervical and film status, equality, and patient and provider preference [(4)]. Oxytocin is the commonest induction agent used worldwide. It has been used alone, in combination with amniotomy or following cervical ripening with other pharmacological or non-pharmacological methods. delivered by an intravenous infusion titrated to uterine contraction strength and frequency. There is debate over the optimum dose regimen and how it impacts on maternal and fetal outcomes, particularly induction to birth interval, mode of birth, and rates of hyperstimulation. Current induction of labour regimens include both high- and low-dose regimens and are delivered by either continuous or pulsed infusions, with both linear and non-linear incremental increases in oxytocin dose [(7)]. As term approaches, the pregnant uterus becomes increasingly more sensitive to oxytocin, until at the optimum time only physiological amounts of exogenous oxytocin are required to - induce labour successfully [(5)].

We conducted this review to summarize the best evidence available for pregnant women at high risk requiring induction of labor by intravenous oxytocin.

2. OBJECTIVE

This study was aimed to determine, from the best available evidence, the effectiveness and safety of intravenous oxytocin alone for induction of labour in high risk pregnancies, this review will assess the advantage and disadvantage of this procedure and highlight the most important evidence in for each section.

3. METHODOLOGY

We conducted a comprehensive literature search of the English language literature using Medline and the Cochrane Database of Systematic Reviews. The search covered the period until July 2016. We used combinations of the following search terms "labor, induced/or induction of labor; intravenous oxytocin, high risk pregnancy ". Titles and abstracts were reviewed for possible exclusion. If we excluded a citation, then we eliminated that publication from further review. If at least we felt the citation might be included or if there was insufficient information to make a determination from the title and abstract, we obtained the full article for review. We identified additional articles for consideration of inclusion through cross checks of relevant bibliographies. Reference lists were created and full-text articles were retrieved for further consideration for inclusion.

4. RESULTS

Sometimes it is necessary to bring on labour artificially, because of safety concerns either for the pregnant woman or her baby. Oxytocin is the most common drug used to induce labour and has been used either alone, with other drugs or after artificial rupture of the membranes. In this review we looked at the use of oxytocin alone for inducing labour. in this review we included the most important 11 studies that are assessing our investigation, most of these study were systemic reviews which compare the Oxytocin with other agents in term of bringing the labour earlier.

Comparing Oxtocin with other agent for induction of labour:

In our search we have identified a systemic review study conducted by Alfirevic et al. 2009, [8] that included Sixty-one trials (12,819 women) in thier investigation through comparing oxtocin agent to other labour induction agents and the study showed results as following:

Three trials including 399 women reported that IV oxytocin, when compared with expectant management, reduced failure to achieve vaginal delivery within 24 hours (16/191 versus 112/208; RR 0.16, 95% CI 0.10 to 0.25; NNT = 3). Meta-analysis of 24 trials including 6620 women found a small but statistically significant increased rate of caesarean delivery for women in the oxytocin group (339/3267 versus 301/3353; RR 1.17, 95% CI 1.01 to1.35; NNH = 66). There was no significant difference in uterine hyperstimulation with or without FHR changes. Use of oxytocin significantly reduced chorioamnionitis (14 studies, 5514 women 144/2720 versus 213/2795; RR 0.69, 95% CI 0.57 to 0.85; NNT = 40); however there was significant heterogeneity among the included trials for this comparison, (I^2 = 65%, P = 0.001) and the authors' analysis of the studies included in this comparison using the random effects method was not statistically significant. Likewise, NICU admissions were reduced by oxytocin compared to placebo or expectant management, (7 studies, 4387 women, 264/2196 versus 333/2191; RR 0.79, 95% CI 0.68 to 0.92, NNT = 32). However, there was significant between study heterogeneity for this comparison (I^2 = 70%, P = 0.0003) and this result was no longer statistically significant when the random effects method was used for analysis. The majority of the studies included in these comparisons required ruptured membranes for entry, likely influencing this result. Data were insufficient to establish conclusions regarding neonatal and maternal mortality or serious morbidity [8].

Three trials including 260 women reported that oxytocin was associated with more failures to achieve vaginal delivery within 24 hours than vaginal PGE2 (73/132 versus 40/128; RR1.77, 95% CI 1.31 to 2.38; NNH = 5). When comparing oxytocin with vaginal PGE2, there was no significant difference in the rates of caesarean section (26 trials, 4514 women, 274/2259 versus 246/2255; RR 1.11, 95% CI 0.94 to 1.30). The incidence of uterine hyperstimulation with fetal heart rate (FHR) changes was very low and not different between groups. Fewer women receiving oxytocin developed chorioamnionitis than those receiving vaginal PGE2 (4 trials, 2742 women, 54/1381 versus 81/1361; RR 0.66, 95% CI 0.47 to 0.92, NNT = 50). Data were insufficient to draw conclusions regarding neonatal and maternal mortality or morbidity; based on limited data, there were no differences between groups [8].

Two studies that included 258 women When oxytocin was compared with intracervical prostaglandins, there was an increase in unsuccessful vaginal delivery within 24 hours (50.4% versus 34.6%,RR 1.47, 95% CI 1.10 to 1.96) and an increase in caesarean sections (19.1% versus 13.7%, RR 1.37, 95% CI 1.08 to 1.74) in the oxytocin group [8].

There were only three trials with 291 women that compared oxytocin with PGF2α. None reported on the number of women failing to deliver vaginally within 24 hours. There were no significant differences in uterine hyperstimulation with FHR changes (one trial 23 women) or rates of caesarean delivery (3 trials 280 women). There were no cases of serious neonatal morbidity or perinatal deaths in the two studies that reported this outcome [8].

Most of the studies included women with ruptured membranes, and there was some evidence that vaginal prostaglandin increased infection in mothers (chorioamnionitis RR 0.66, 95% CI 0.47 to 0.92) and babies (use of antibiotics RR0.68, 95% CI 0.53 to 0.87). These data should be interpreted cautiously as infection was not pre-specified in the original review protocol [8].

Use of Oxytocin with amniotomy for labour induction:

Our search identified one Cochrane systematic review including 17 trials with 2566 women comparing IV oxytocin plus amniotomy with other methods for induction of labour [9].This review compared amniotomy plus oxytocin (in varying doses), with placebo, vaginal prostaglandin E2 or F2α, or amniotomy alone. Oxytocin plus amniotomy resulted in fewer cases of meconium stained amniotic fluid than placebo or no treatment (one trial, 184 participants, 3/92 versus 13/92; RR 0.23, 95% CI 0.07 to 0.78; NNT = 9). There were no other significant differences in our outcomes of interest for this comparison [9].

When compared with vaginal prostaglandins, amniotomy plus IV oxytocin was associated with more postpartum hemorrhage (2 studies, 160 women, 11/80 versus 2/80; RR 5.5, CI 1.26 to 24.07; NNH = 9). One RCT of 100 subjects found that more women were dissatisfied with amniotomy and IV oxytocin than vaginal prostaglandins, (26/50 versus 0/50; RR 53, CI 3.32 to 846.51; NNH = 1). There were no other significant differences between oxytocin plus amniotomy and vaginal prostaglandins [9].

One study with 30 participants compared oxytocin plus amniotomy with cervical prostaglandins. This study was too small to detect any differences in outcomes of interest. Likewise, only two studies with 309 total participants compared oxytocin plus amniotomy with oxytocin alone. These studies were also underpowered to detect differences in any outcome of interest [9].

When compared with those who received amniotomy alone, fewer women who received amniotomy plus IV oxytocin were not delivered vaginally at 24 hours (2 studies, 296 participants, 3/148 versus 24/148; RR 0.13, 95% CI 0.04 to 0.41; NNT = 8). Amniotomy plus IV oxytocin also resulted in significantly fewer instrumental vaginal deliveries than amniotomy alone (2 studies, 510 participants, 57/255 versus 88/255; RR 0.65, CI 0.49 to 0.85; NNT = 995% CI 6 to 20) [9].

Moreover our search has identifed one study [10] included Six trials of (9332 women) that was aimed to compare the effects of ergometrine-oxytocin with oxytocin in reducing therisk of PPH (blood loss of at least 500 ml) and other maternal and neonatal outcomes.

Ergometrine-oxytocin was associated with a small reduction in the risk of postpartum haemorrhage (PPH) using the definition of PPH of blood loss of at least 500 ml (odds ratio 0.82, 95%confidence interval 0.71 to 0.95) [10]. This advantage was found for both a dose of 5 iu oxytocin and a dose of 10 iu oxytocin, but was greater for the lower dose. There was no difference detected between the groups using either 5 or 10 iu for the stricter definition of PPH of blood loss at least 1000 ml. Adverse effects of vomiting, nausea and hypertension were more likely to be associated with the use of ergometrine-oxytocin. When heterogeneity between trials was taken into account there were no statistically significant differences found for the other maternal or neonatal outcomes [10].

in this systemic search we have identifed a review by Westhoff et al; 2013[11], that included 20 trials (involving 10,806 women) that was aimed to determine the effectiveness of prophylactic oxytocin at any dose to prevent PPH and other adverse maternal outcomes related to the third stage of labour.

Prophylactic oxytocin when compare to placebo[11].

Prophylactic oxytocin compared with placebo reduced the risk of PPH greater than 500 mL, (risk ratio (RR) 0.53; 95% confidence interval (CI) 0.38 to 0.74; six trials, 4203 women; T^2 = 0.11, I^2= 78%) and the need for therapeutic uterotonics (RR 0.56; 95% CI 0.36 to 0.87, four trials, 3174 women; T^2= 0.10, I^2= 58%). The benefit of prophylactic oxytocin to prevent PPH greater than 500 mL was seen in all subgroups. Decreased use of therapeutic uterotonics was only seen in the following subgroups: randomised trials with low risk of bias (RR 0.58; 95% CI0.36 to 0.92; three trials, 3122 women; T^2= 0.11, I^2= 69%); trials that performed active management of the third stage (RR 0.39; 95% CI 0.26 to 0.58; one trial, 1901 women; heterogeneity not applicable); trials that delivered oxytocin as anIV bolus (RR 0.57; 95% CI 0.39 to 0.82; one trial, 1000 women; heterogeneity not applicable); and in trials that gave oxytocin at a dose of 10 IU (RR 0.48; 95% CI0.33 to 0.68; two trials, 2901 women; T^2= 0.02, I^2= 27%)[11].

Prophylactic oxytocin when compaired with ergot alkaloids , was superior to ergot alkaloids in preventing PPH greater than 500 mL (RR 0.76; 95% CI 0.61 to 0.94; five trials, 2226 women; T^2= 0.00, I^2= 0%). The benefit of oxytocin over ergot alkaloids to

prevent PPH greater than 500 mL only persisted in the subgroups of quasi-randomised trials (RR 0.71, 95% CI 0.53 to 0.96; three trials, 1402 women; T^2= 0.00, I^2= 0%) and in trials that performed active management of the third stage of labour (RR 0.58; 95% CI0.38 to 0.89; two trials, 943 women; T^2= 0.00, I^2= 0%). Use of prophylactic oxytocin was associated with fewer side effects compared with use of ergot alkaloids; including decreased nausea between delivery of the baby and discharge from the labour ward (RR 0.18; 95% CI 0.06 to 0.53; three trials, 1091 women; T^2= 0.41, I^2= 41%) and vomiting between delivery of the baby and discharge from the labour ward (RR 0.07; 95% CI 0.02 to 0.25; three trials, 1091 women; T^2= 0.45, I^2= 30%)[(11)].

An electrocardiographic study of fetal heart rates during intravenous oxytocin induction was carried out by Hess and Hon, [(6)] they noted that only minor deviations in the fetal heart rate occurred during routine induction. Abnormal deviations were observed if the induction was too rapid, especially at the onset, and if -any contractions were of longer duration than 55-60 seconds. The fetal bradycardia which occurred did so late in the contraction phase and was felt to be hypoxic in origin. [(6)]

5. CONCLUSION

When women require induction of labour, oxytocin is the most common agent used, delivered by an intravenous infusion titrated to uterine contraction strength and frequency. oxytocin seems to be a safe method of inducing labour. Compared to waiting to see whether labour starts naturally (expectant management), giving oxytocin led to more women having their babies within 24 hours. Comparison of oxytocin with any other agents which induce labour at high risk pregnancy such intravaginal or intracervical PGE2 reveals that the prostaglandin agents probably increase the chances of achieving vaginal birth within 24 hours. Oxytocin induction may increase the rate of interventions in labour.

REFERENCES

[1] Caughey AB, Sundaram V, Kaimal AJ, Cheng YW, Gienger A, Little SE, Lee JF, Wong L, Shaffer BL, Tran SH. et al. Maternal and neonatal outcomes of elective induction of labor. [Review] [168 refs]Evidence Report/Technology Assessment. 2009;176:1–257.

[2] Martin JA, Hamilton BE,Sutton PD, Ventura SJ,Menacker F, Kirmeyer S, *et al*. Births: final data for 2005. *Natl Vital Stat Rep*2007;56.

[3] Declercq ER, Sakala C,Corry MP, Applebaum S.Listening to Mothers II: Report of the Second National US Survey of Women's Childbearing Experiences. New York, NY: Childbirth Connection,2006.

[4] Mozurkewich, E., Chilimigras, J., Koepke, E., Keeton, K. and King, V. (2009), Indications for induction of labour: a best-evidence review. BJOG: An International Journal of Obstetrics & Gynaecology, 116: 626–636. doi:10.1111/j. 1471-0528.2008.02065.

[5] B. WAXMAN, M.D. Induction of Labour with Intravenous Oxytocin Using a Constant Infusion Pump London, Ont. Canad. Med. Ass. J. Jan. 27, 1962, vol. 86.

[6] HEss, 0. W. AND HON, E. H.: Amer. J. Obstet. Gynec., 80: 558, 1960.

[7] Budden A, Chen LJY, Henry A. High-dose versus low-dose oxytocin infusion regimens for induction of labour at term. Cochrane Database of Systematic Reviews 2014, Issue 10. Art. No.: CD009701. DOI: 10.1002/1465 1858.CD009701.

[8] Alfirevic Z, Kelly AJ, Dowswell T. Intravenous oxytocin alone for cervical ripening and induction of labour. Cochrane Database of Systematic Reviews 2009, Issue 4. Art. No.: CD003246. DOI: 10.1002/14651858.CD003246.

[9] Howarth G, Botha DJ. Amniotomy plus intravenous oxytocin for induction of labour. Cochrane Database of Systematic Reviews. 2009.

[10] McDonald SJ, Abbott JM, Higgins SP. Prophylactic ergometrine-oxytocin versus oxytocin for the third stage of labour. Cochrane Database of Systematic Reviews 2004, Issue 1. Art. No.: CD000201. DOI: 10.1002/1465 1858.CD000201.

[11] Westhoff G, Cotter AM, Tolosa JE. Prophylactic oxytocin for the third stage of labour to prevent postpartum haemorrhage. Cochrane Database of Systematic Reviews 2013, Issue 10. Art. No.: CD001808. DOI: 10.1002/1465 1858.CD001808.