

Review Article

DOSE REGIMENS OF OXYTOCIN FOR LABOUR AUGMENTATION : A NARRATIVE REVIEW

ABSTRACT- Background-Obstetricians play main role in providing and rising maternal and child health (MCH) care facilities. one amongst the goal of MCH care is safe delivery with smart feto-maternal outcome. The drug is given to extend contractions and range of spontaneous duct births with high dose regimens. The hormone plays vital role to cut back rates of caesarean birth once used for management of dystocia. For augmentation of labour hormone regimens are low-dose (1-3 milli units/min) and High dose (4-7 milli units/min). Studies have shown High-dose of hormone causes hyperstimulation to womb. it's been mentioned that there's decrease in induction to delivery time at meta-analysis.(1) Augmentation of labor is that the method of accelerating the frequency of contractions to facilitate a labor .The principal methodology for achieving augmentation of labor varies in the use and approach.Oxytocin is widely used for each induction and augmentation of labor. (2).Interventions with oxytocin particularly at high doses would lead to adverse effects on fetal heart rate and uterine tachysystole which occurs due to reduction in blood flow during contraction in intervillous spaces.The purpose of use of oxytocin is for physiological birth and for successful delivery practices.At,the same time these results reinforce the need to reflect on a change in care during delivery.Thus,this will help health care professional for better understanding on use and its effect during labor which will help in proper decision making for augmentation of labor.

Keywords: Oxytocin, Labour ,Dose,Augmentation of labour, Caesaren, High dose,Low dose.

Introduction

Obstetricians play main role in providing and rising maternal and kid health (MCH) care facilities. One amongst the goal of MCH care is safe delivery with smart feto-maternal outcome. Although obstetrical delivery is finished ordinarily for safe feto-maternal outcome in high risk cases and abnormal labour,when compared to duct delivery. It conjointly will increase monetary

burden on health care system. Dystocia and failure to progress in labor is one of the adverse events to be taken care in obstetrics for fetomaternal outcome. The drug oxytocin is given to extend contractions and range of spontaneous births with high dose regimens leading to hyperstimulation of the uterus. The three P's for progress of labour are Passage (pelvis), Passenger (foetus) and Power (uterine contraction). The observance of progress of labour includes dilatation of cervix, rotation and descent of the vertebrate head relying upon the period and frequency of contractions. Oxytocin is the commonest worldwide induction agent used for augmentation of labour. Its accustomed cause regular co-ordinated contractions from the structure to cervix throughout induction of labour. Increase in infusion, titrated to the strength and frequency causes uterine contractions. (3) The aim of this review is to summarize the safety and effectiveness of oxytocin of each high dose and low dose used for the labour stimulation and augmentation at term.

Methodology

The literature reviewed during this narrative article is obtained from articles from numerous databases like PubMed, Scopus, Web of Science and numerous national and international medical specialty and medical specialty associations victimisation MeSH-compliant

Keywords- oxytocin, labour, augmentation, caesarean.

Physiological effects of oxytocin

Hormone Oxytocin was 1st utilized by trickle for labor induction back in 1948 by Theobald et al. Later, in 1953, it had been the primary peptide synthesized by Du Vigneaud et al. The half-life of hormone is 2-3 minutes. It's been shown that it takes forty minutes to attain plasma concentration in a steady state. The sensitivity of hormone will increase with advanced fetal age. The dose is titrated and exaggerated each 20-30 min till regular contractions are achieved (3-4 each ten minutes). Although Oxytocin hormone for augmentation of labor and its use for induction of labor remains controversial. Oxytocin infusion will be withheld or stopped with decrease in fetal heart rate and left lateral propped up position is given to the women for good fetomaternal outcome. A Cochrane review of comparison on the employment of hormone alone for induction of labor compared with other prostaglandins all over that the latter most likely will help increase the probabilities of delivery inside twenty four hours.

Dose Regimens of hormone Oxytocin

The comparison of oxytocin with high-dose or low-dose regimen supports completely different parameters. These are quantity of beginning dose, rate of progressive dose and intervals of step-up. The high-dose regimens varied across the various trials; the range of beginning of the dose is four to ten milli-unit/minute (mU/min), with will increase in dose starting from four to 7 mU/min and most rates starting from four to 90 mU/min. The Low-dose programme commences infusion at a spread of 1–4 mU/min, with rate will increase starting from one to 2 mU/min and most rates move between 1 and 32 mU/min as mentioned in one systematic review . Intervals of step-up of hormone doses vary from 15 minutes to 60 minutes across the trials.

Efficacy and safety of high dose and low dose of oxytocin for augmentation of labour.

Oxytocin regimens for labour induction are typically high-dose (4–6 mU/min) or low-dose (1–1.5 mU/min). The study results discovered that there have been exaggerated caesarean rate related to contraction abnormalities. An intermediate-dose of hormone was hand-picked that was ascertained to indicate lower caesarean rate compared with the high-dose regimen of oxytocin , Hence, within the study an intermediate-dose hormone programme was most well-liked to the high-dose programme for augmentation of labour .(7) Low-dose oxytocin is usually recommended to avoid events like tachysystole and foetal distress .The use of high-dose hormone had no role in management of delay in labour however but related to lower frequency of obstetrical delivery rates (8) In a study with completely different regimens of high dose and low dose , there was no distinction in obstetrical delivery rate or instrumental delivery rates associated with infant outcomes. Therefore, either of the 2 regimens are acceptable to be used for induction of labour.(9) High-dose was conjointly related to a rise in spontaneous deliveries and a shortened labor. whereas the chance of hyperstimulation was exaggerated with high-dose hormone, there was no proof of a rise in adverse maternal or infant outcomes with this approach to worrisome on maternal-fetal outcome.(10) Women receiving early hormone had, on average, a shorter interval between randomisation and birth of 2 hrs shorter, 95% CI ; 3 trials, 1083 women). 2 trials indicated no important distinction between the comparison teams within the range of woman undelivered twelve hours of randomisation (RR zero.32, 95% CI 0.07 to 1.43; 2 trials, 1042 women). However, trial (60 women) did not show a bearing between the hyperstimulation of uterus with fetal heart rated (RR vi.66, 95% CI 0.39 to 112.6. there have been no variations ascertained within mode of

instrumental delivery (RR one.17, 95% CI 0.72 to 1.88; 5 trials, 1200 women) .2 trials that collected data on women's views of their experiences in giving birth indicated no variations in maternal -fetal outcomes satisfaction between the different dose regimens of oxytocin in labor augmentation.

Efficacy and safety of high dose and low dose of hormone on neonatal outcome.

The results of this study by Hidalgo-Lopezosa *Etal* show that the employment of hormone aborning stimulation is related to exaggerated obstetrical delivery rates which may be injurious to have an effect on each mother and fetus , However, it had no adverse effects on meconium stained liquor, advanced infant revitalisation and 5-min apgar score of the baby. These results facilitate professional for deciding the results of the employment of hormone throughout labour, which may be helpful for decision-making in clinical apply.(5) The study by Zhang J *Etal* High-dose hormone programme (starting dose at four mU/min)is related to a shorter period of 1st stage of labor and increasing the speed of obstetrical delivery and adversely affect on perinatal outcomes. High dose of hormone was related to decrease in chorioamnionitis, meconium stained liquor in the baby.The low dose of hormone ranging from one mU/min reduces 1st stage of labour and it had no have an effect on in second stage of labour.(6)

Efficacy and safety of high dose and low dose of hormone for augmentation of labor at term: Systematic review

We enclosed 9 irregular controlled trials involving 2391 pregnant woman during this review. The quality of the trials were of moderate overall. All trials compared giving a high dose versus a low dose of oxytocin for induction of labouring patients. The induction to delivery interval was considerably shorter with high-dose compared to low-dose oxytocin.The mode of delivery by caesarean section was comparatively on higher side when compared with other various doses of hormone for induction and augmentation of labour. No trials provided any data concerning the woman with hyperstimulation of uterus during labor with any worsen neonatal outcome . The trials were at moderate to high risk of bias overall giving different research and intervention with different regimens of oxytocin for augmentation of labor . The definition of high- and low-dose protocols and therefore the outcomes measured varied significantly across the trials.

Recommendations

- The use of a package of care (“active management of labour”) for prevention of delay in labour.
- In intact membranes, Amniotomy ought to be performed wherever possible before beginning of infusion with oxytocin.
- The aim for a most of three – four contractions in 10 minutes during augmentation with oxytocin in labor. .
- Prescribe and record the dose of hormone being delivered (i.e.minute) .
- Continuous CTG monitoring is employed for induction or augmentation of labor with oxytocin.

Conclusion

The use of high dose of oxytocin is related to considerably shorter labor however might end in hyperstimulation of womb and foetal distress and low dose of oxytocin motivate contractions safely and will increase each frequency and force of contractions. Titration of oxytocin infusion and constant fetomaternal management and measures would facilitate to revert back fetal heart changes or contraction abnormalities . Augmentation of labour can facilitate to enhance success rate. Various trials and studies are required to be created for safety of patient whereas rising medical specialty outcomes to be used of normal protocols for constant. The evidences supported completely different regimens of oxytocin doses and quality of study is of bigger concern . but there's scant proof for different maternal and infant outcomes on low dose versus high doses regimens of oxytocin.(11)

REFERENCES:

1. Budden A, Chen LJ, Henry A. High-dose versus low-dose oxytocin infusion regimens for induction of labour at term. Cochrane Pregnancy and Childbirth Group, editor. Cochrane Database Syst Rev [Internet]. 2014 Oct 9 [cited 2020 Dec 12]; Available from: <http://doi.wiley.com/10.1002/14651858.CD009701.pub2>
2. Kernberg A, Caughey AB. Augmentation of Labor: A Review of Oxytocin Augmentation and Active Management of Labor. *Obstet Gynecol Clin North Am*. 2017 Dec 1;44(4):593–600.
3. Endocrinology of parturition [Internet]. [cited 2020 Dec 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3659907/>
4. Kenyon S, Tokumasu H, Dowswell T, Pledge D, Mori R. High-dose versus low-dose oxytocin for augmentation of delayed labour. Cochrane Pregnancy and Childbirth Group, editor. Cochrane Database Syst Rev [Internet]. 2013 Jul 13 [cited 2020 Dec 7]; Available from: <http://doi.wiley.com/10.1002/14651858.CD007201.pub3>
5. Hidalgo-Lopezosa P, Hidalgo-Maestre M, Rodríguez-Borrego MA. Labor stimulation with oxytocin: effects on obstetrical and neonatal outcomes. *Rev Lat Am Enfermagem* [Internet]. 2016 Jul 25 [cited 2021 May 31];24. Available from: <https://www.scielo.br/j/rlae/a/RVcQ6KDg65jfXSnmyfctRq/?lang=en>
6. Zhang J, Branch DW, Ramirez MM, Laughon SK, Reddy U, Hoffman M, et al. Oxytocin Regimen for Labor Augmentation, Labor Progression, Perinatal Outcomes. *Obstet Gynecol*. 2011 Aug;118(2 0 1):249–56.

7. Manjula BG, Bagga R, Kalra J, Dutta S. Labour induction with an intermediate-dose oxytocin regimen has advantages over a high-dose regimen. *J Obstet Gynaecol*. 2015 May 19;35(4):362–7.
8. Selin L, Wennerholm U-B, Jonsson M, Dencker A, Wallin G, Wiberg-Itzel E, et al. High-dose versus low-dose of oxytocin for labour augmentation: a randomised controlled trial. *Women Birth J Aust Coll Midwives*. 2019 Aug;32(4):356–63.
9. Prichard N, Lindquist A, Hiscock R, Ruff S, Tong S, Brownfoot FC. High-dose compared with low-dose oxytocin for induction of labour of nulliparous women at term. *J Matern Fetal Neonatal Med*. 2019 Feb 1;32(3):362–8.
10. Liu J, Yi Y, Weiwei X. Effects of Increased Frequency, High Dose, and Pulsatile Oxytocin Regimens on Abnormal Labor Delivery. *Med Sci Monit Int Med J Exp Clin Res*. 2018 Apr 7;24:2063–71.
11. Mori R, Tokumasu H, Pledge D, Kenyon S. High dose versus low dose oxytocin for augmentation of delayed labour. In: The Cochrane Collaboration, editor. *Cochrane Database of Systematic Reviews* [Internet]. Chichester, UK: John Wiley & Sons, Ltd; 2011 [cited 2020 Dec 12]. p. CD007201.pub2. Available from: <http://doi.wiley.com/10.1002/14651858.CD007201.pub2>