



STUDY OF INDUCTION OF LABOR WITH COMBINATION OF NITRIC OXIDE (NO) DONOR & MISOPROSTOL VERSUS MISOPROSTOL ALONE

Obstetric & Gynaecology

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ABSTRACT

Background: Induction of labor implies stimulation of contractions before the spontaneous onset of labor, with or without rupture of membranes. when the cervix is closed and uneffaced, labor induction will often commence with cervical ripening. **Aims & Objectives:-** 1. To assess the effectiveness of combination with Isosorbide mononitrate (NO donor) & Misoprostol versus Misoprostol alone in induction of labor. 2. To analyze the factors affecting the mother and the fetus in both the treatment strategies **Methods:** A case control study carried out on 100 term and post term pregnant women for induction of labor for a variety of obstetric, medical and social indications in a period of 1 year from January 2021 to January 2022. **Results:** out of total 100 cases, The common indication for Induction of labour is past dates which constitutes 65% in both the groups. In the ISMN group after 12 hrs. BISHOP'S score improved to 8-12 in 100% cases, where as in misoprostol group only 6% of cases improved to 8-12%. Mode of delivery, LSCS is 20% and 42%, NVD is 80% & 54 % in group A & B respectively. The mean duration of Induction to delivery interval in minutes is 759.56 ± 371.25 & 715.30 ± 384.32 respectively in group A & group B. Intrapartum complications seen in 14% & 34% cases in group A & group B respectively. **Conclusion:** Induction with combination of Isosorbide mononitrate + misoprostol has better outcome with few side effects when compared to misoprostol alone. Nitric oxide (NO) donor, Isosorbide mononitrate is safe, well tolerated and effective cervical ripening agent, which induces ripening of cervix without causing uterine contractions & less side effects like uterine hyper stimulation, meconium stained liquor, fetal distress which further aids in low caesarean section rate.

KEYWORDS

INTRODUCTION:

Induction of labor is commonly suggested for obstetric indications like post term pregnancy, premature rupture of membranes and medical indications like gestational hypertension, diabetes, oligohydramnios.⁽¹⁾

Cervical status is now considered as the important aspect for labor induction⁽²⁾ Cervical ripening is clinically diagnosed by cervical softening, effacement, and dilatation.

It is normally induced pharmacologically prior to the labor induction to decrease the risk of prolonged labor, caesarean section, induction failure and maternal and fetal morbidity⁽³⁾

Since antiquity several methods of induction of labor are used like massage of uterus, intracervical laminaria tents, herbal compounds, castor oil, hot baths popularly known as oil-based enemas (OBE), trans cutaneous nerve stimulation, balloon device inserted through the cervix into the extra amniotic space, artificial rupture of membranes / amniotomy, oxytocin, prostaglandins and misoprostol are used.

Prostaglandins (PGs) and their E series analogues are effective agents for cervical ripening, but has side effects like tachysystole, uterine hyperstimulation and even rupture of uterus can occur⁽⁴⁾

Studies showed that nitric oxide (NO) has a vital role in the cervical ripening process. ⁽⁵⁾NO donors in clinical trials, like isosorbide Mononitrate (ISMN), Glyceryl trinitrate (GTN), and sodium nitroprusside resulted in decreased cervical resistance in patients undergoing 1st trimester abortion before uterine evacuation and are also considered as the effective cervical ripening agents at term.⁽⁶⁾

Isosorbide mononitrate causes increase in cyclo-oxygenase-2 which induces endogenous prostaglandin production in the cervix and also leads to cervical ultrastructural rearrangement that is similar to spontaneous onset of labour.

MATERIALS AND METHODS

Study Design:

A case control study carried out on 100 term and post term pregnant women for induction of labor for a variety of obstetric, medical and social indications in a period of 1 year from January 2021 to January 2022 admitted in GEMS MEDICAL COLLEGE AND HOSPITAL,

SRIKAKULAM, AP- a tertiary care rural hospital.

After getting approval from Ethics committee started this project.

Methodology: The study design is made into two groups, GROUP A & GROUP B

GROUP A:

50 cases (ISOSORBIDE MONONITRATE + MISOPROSTOL)

GROUP B: 50 Cases (MISOPROSTOL)

Inclusion Criteria

Singleton live fetus in cephalic presentation at term and post term, not in active labor, Obstetric or medical conditions for induction of labor. Bishop's score > 6.

Exclusion Criteria

Parity (3 or more), hypersensitivity to prostaglandins, Previous Caesarean section or any other form of uterine surgery such as myomectomy, Fetal macrosomia or growth retardation, Malpresentations, Multiple pregnancies, Abnormality of the fetal heart rate, Maternal medical disorders, Cephalo pelvic disproportion are excluded.

consent was taken after explaining about the possible risks of induction, blood reserve kept.

Participant data which includes demographic characteristics, obstetric history, LMP, medical history, course of labour, indication for labor induction and outcomes were noted BP, pulse rate, uterine contractions, and assessment of pelvis and evaluation of cervix that is consistency, effacement, dilatation, position and station is noted by doing per vaginal examination.

Cardiotocography (admission test) was done to rule out any foetal compromise. Fetal heart rate monitored throughout the induction, during labor and delivery, necessary interventions taken.

Laboratory Investigations:

Hb, CBC, BT, CT, BGT, CUE, Thyroid profile, GCT, HIV, HBsAg, HCV, VDRL.

Antenatal Scan to assess the foetal biometry, duration of gestation

(term), Estimated fetal birth weight, presentation of fetus, amount of liquor (AFI), localization of placenta & calcifications, FHS etc. are noted.

The Participating women were randomized in two groups: GROUP A & GROUP B

GROUP A:

50 cases (ISOSORBIDE MONONITRATE + MISOPROSTOL)

ISMN 60 mg tab is inserted in posterior fornix of vagina. Cervix is reassessed after 12 hrs; then misoprostol 25mcg is given 4th hrly till 3 contractions in 10 mts to the maximum of 6 doses.

GROUP B:

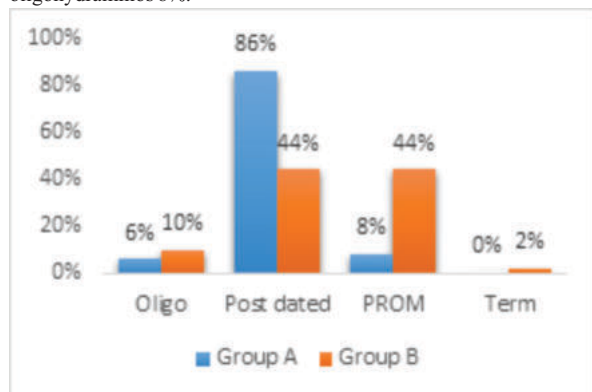
50 Cases (MISOPROSTOL)

Induction with misoprostol 25 mcg is inserted in posterior fornix of vagina every to the maximum of 6 doses

- Change in Bishop's Score, induction-to delivery interval, uterine hyper stimulation rates and other maternal side effects, mode of delivery if LSCS indication in both groups noted
- Neonatal outcome in the form of Apgar score, incidence of MSL, NICU admission in both the groups noted.

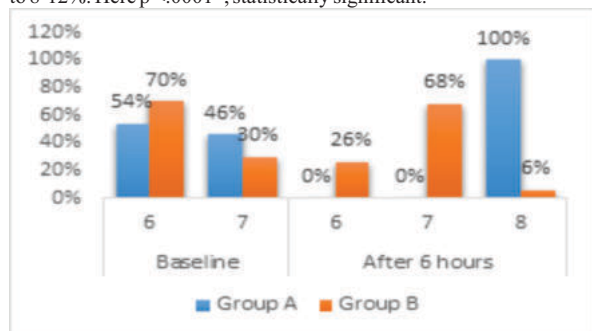
RESULTS

The common indication for Induction of labour is past dates which constitutes 65%, next comes the PROM 26 % & lastly oligohydramnios 8%.



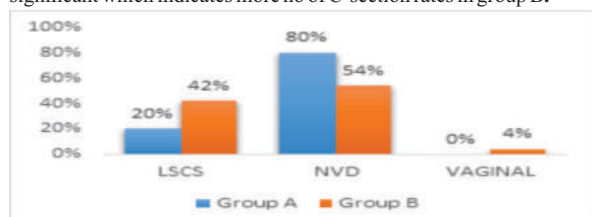
MODIFIED BISHOP'S SCORE

In the ISMN group after 12 hrs. BISHOP'S score improved to 8-12 in 100% cases, whereas in misoprostol group only 6% of cases improved to 8-12%. Here $p < .0001^*$, statistically significant.



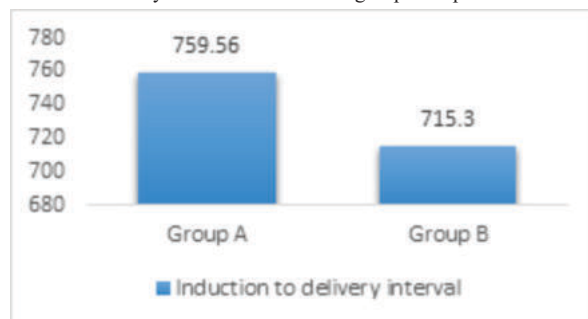
MODE OF DELIVERY

In this study the mode of delivery, LSCS is 20% and 42%, NVD is 80% & 54 % in group A & B respectively. Here $p = 0.01^*$, statistically significant which indicates more no of C-section rates in group B.



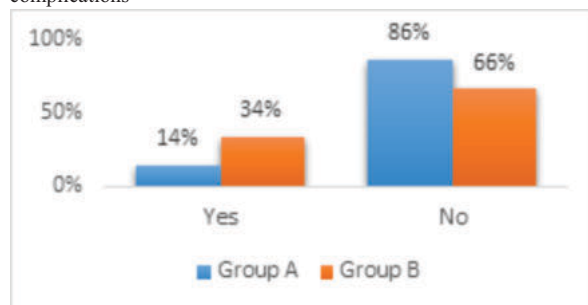
Induction To Delivery Interval

The mean duration of Induction to delivery interval in minutes is 759.56 ± 371.25 & 715.30 ± 384.32 respectively in group A & group B. Here P value is 0.55 which is statistically not significant. Though ISMN help in the effacement of cervix it has relaxant action in the uterine smooth muscle, as a result there is no significant change in the induction delivery interval when both the groups compared.



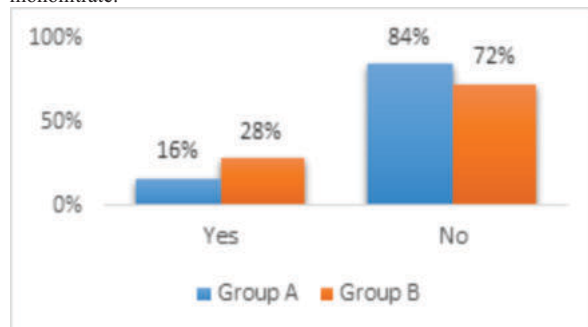
Intrapartum Complications

In this study intrapartum complications seen in 14% & 34% cases in group A & group B respectively. Here, $p = 0.01^*$, statistically significant Intrapartum complications is less in ISMN group because sodium nitroprusside helps in cervical ripening & dilatation without causing uterine hyper stimulation there by decreasing the complications



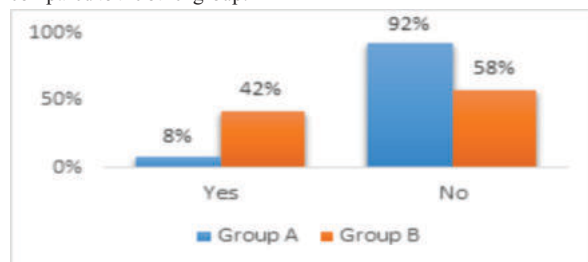
Meconium Stained Liquor-MSL

In this study the MSL is seen in 16%, 28% in group A & group B respectively. Here $p = 0.14$, Not Statistically significant. The cases having meconium stained liquor are less in ISMN group because its uterine smooth muscle relaxation & vasodilator effect of Isosorbide mononitrate.



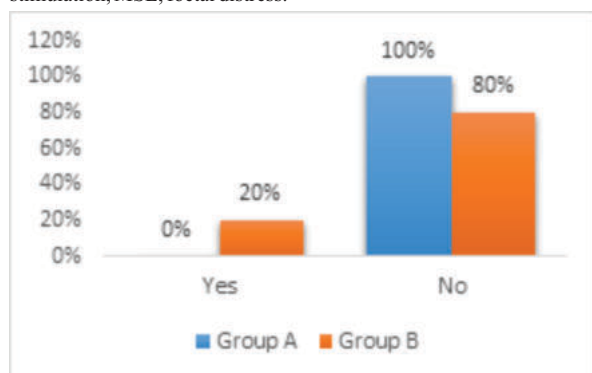
Foetal distress

In this study fetal distress is 8% & 42% cases in group A & group B respectively. Here $p = 0.0001^*$, statistically significant. This is due to ISMN having the property of vasodilatation & uterine smooth muscle relaxant effect, cases having foetal distress was reduced when compared to the other group.



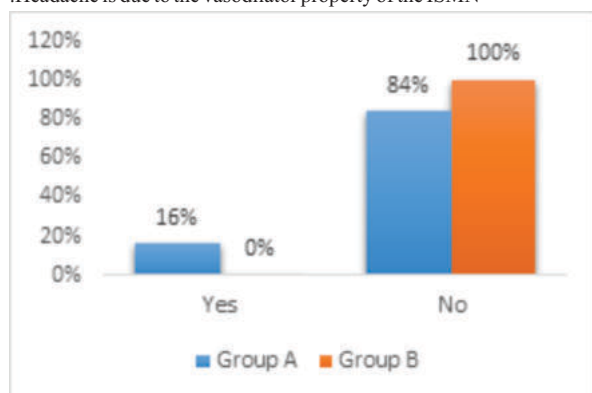
NICU admission

In this study more no of NICU admissions is seen in 20% cases in group B, here $p=0.0001^*$, statistically significant Less no of NICU admissions in ISMN group because of less side effects due to its uterine smooth muscle relaxation property which decreases the uterine hyper stimulation, MSL, foetal distress.



Maternal Headache

In this study maternal headache seen in 16%, 0% cases in group A & group B respectively. Here $p=0.0001^*$, statistically significant. Headache is due to the vasodilator property of the ISMN.



DISCUSSION

There is statistical difference in the Bishop's score, the mean bishop's score after 12 hrs improved in the group A compared to group B which is similar in other study conducted by the following authors **Shikha Agarwal et al, Nasreen Noor et al, Sherif et al.**

There is a successful induction in GROUP A that is low caesarian section when compared to group B similar result obtained by the study conducted by the following authors **Shikha Agarwal et al, Mohamad Elsokary et al.**

Induction to delivery interval in both groups is not significant statistically. Similar observation is made by the following authors. **Kriti Singh et. Al, Wolfer et al.** There is statistical significance in the intra partum complications being more in group B compared to group A. Among the intrapartum complications there is no statistical differences like uterine hyper stimulation rate, PPH, chorioamnionitis in both the groups because of careful monitoring and timely intervention of cases. The similar results were obtained in the study conducted by the following authors. **Abdellah et al, Mohamad Elsokary et al.**

There is no incidence of maternal hypotension in both the groups whereas maternal headache occurs in 8% of cases in group B compared to group A, similar results obtained in the studies by the following authors. **Salama Kamel Nasir, Shikha Agarwal et al.**

CONCLUSION

Hence from the above results, one can conclude that induction with combination of Isosorbide mononitrate + misoprostol has better outcome with few side effects when compared to misoprostol alone.

Nitric oxide (NO) donor, Isosorbide mononitrate is safe, well tolerated and effective cervical ripening agent, which induces ripening of cervix without causing uterine contractions & less side effects like uterine hyper stimulation, meconium stained liquor, fetal distress which

further aids in low caesarean section rate.

In this study we have not done stripping to know the efficacy of the drug Isosorbide mononitrate, but when clinically combined with the stripping there will be better results, it further decreases the induction delivery interval

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