Research Article

Clinical study of outcome induction of labour

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Abstract

Introduction: This study was conducted to study the safety and efficacy of oxytocin for induction of labour. This study was carried out in the Department of Obstetrics and Gynaecology, Government Medical College, Aurangabad over a period of one year. Sixty-two patients of high risk and complicated pregnancies were induced with intravenous oxytocin in drip. Number of vaginal deliveries achieved, induction to vaginal delivery interval, incidence of caesarean section for fetal distress, failed induction, side effects and neonatal outcome were studied. The mean induction delivery interval as well as incidence of caesarean section was lower in patients with a good Bishop score and vice versa. Fetal outcome was good with a very low incidence of neonatal jaundice. There were no perinatal deaths. Intravenous oxytocin in drip is of immense value in induction of labour with very few neonatal and maternal complications.
Keywords: oxytocin, induction of labour, Bishop score, Apgar score

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INTRODUCTION

Intervention in pregnancy is indicated when the fetus may face dangers within the uterus to an extent that they outweigh the dangers it would face if delivered. An induced labour is one in which pregnancy is terminated artificially any time after 20th week of gestation by any method which aims at initiation of labour and vaginal delivery. The objectives of induction of labour are to reproduce spontaneous labour as closely as possible without subjecting the mother or fetus to undue risks. Therefore, both maternal and fetal hazards must be asserted before inducing labour. In this study, intravenous oxytocin in drip was used for induction of labour

MATERIAL AND METHODS

The present study on "INDUCTION OF LABOUR" was carried out in the Department of Obstetrics and Gynaecology, Government Medical College, Aurangabad during a period of one year. Sixty-two cases were studied between the 30 and 42 weeks of pregnancy. Most of the cases were high risk and complicated pregnancies. Comprehensive data regarding maternal age, parity, antenatal high risk factors, indication of induction, gestational age was recorded. Test for fetal well-being i.e. Non-stress test and ultrasonography was done. Before induction the cervical in ducibility score was determined by Bishop's method. Induction of labour was done with dilute intravenous infusion of oxytocin. Routinely oxytocin is started with a low dose, but escalated quickly where there is no response. When the optimal response is achieved i.e. uterine contraction sustained for 45 seconds and 3 contractions in 10 minutes, the administration of that particular concentration in mu/minute is to be continued. Calculation of the dose delivered in mu and it's correlation with drop rate per minute.

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Table 1:

Units of oxytocin mixed in 500ml 5% dextrose solution (1 unit = 1000 milliunits)	Drops per minute (in terms of mu/minute)		
	15	30	60
1	2	4	8
2	4	8	16
4	8	16	32
8	16	32	64

So, induction was started with a low dose i.e. 2 units drip was started i.e. concentration of 4 mu/min and the drop rate was increased if there is no response. In majority of cases, a dose of less than16 milliunits/min is enough to achieve objectives. In unresponsive state higher doses are required when induction is done in lesser weeks of gestation. All patients had close clinical monitoring in labour of uterine contractions, fetal heart rate, maternal pulse rate, respiration and blood pressure. The progress of labour was assessed by noting the strength and frequency of uterine contractions, alteration in the state of cervix and descent of the presenting part. Duration, progress and mode of delivery were analyzed. After delivery the oxytocin drip was continued in the concentration of twenty units for one hour to prevent postpartum hemorrhage. The neonatal condition at birth was noted including the Apgar Score at one and five minutes. Serum bilirubin estimation was done on the first day.

OBSERVATIONS

Table 2: Distribution of patients according to parity

Sr. No.	Parity	No. of cases	Percentage
1	Primigravida	26	41.92
2	Second gravid	14	22.58
3	Third gravida and above	22	35.48

Total sixty-two patients were included in the study. Out of them twenty six cases were primigravida, fourteen were second gravida and twenty two were third gravida and above.

Table 3: Distribution of patients according to indication for induction

Sr. No.	Indications	No. of cases
1	Postmaturity	20
2	Pregnancy induced hypertension	16
3	Premature rupture of membranes	13
4	Intrauterine death	9
5	Bad obstetric history	1
6	Intrauterine growth retardation	1
7	Diabetes Mellitus	1
8	Essential hypertension	1

The indication for induction of labour are elaborated in table 3. The most common indication being postmaturity, pre-eclamptictoxaemia and premature rupture of membranes.

Table 4: Relation of Bishop Score to Induction Delivery Intervals

Bishop Score	No. of cases	Mean Induction-Delivery Interval in hours
0 – 4	7	15.14
5 – 8	23	10.00
9 and above	32	8.15

The induction delivery interval varied from 2 hours to 20 hours. The initial Bishop Score was directly related to the induction delivery interval and the response to induction was good when the score was above 9 and the mean Induction-Delivery Interval being 8.15 hours. There were seven cases with the score less than 4 and mean induction delivery interval of 15.14 hours and those with score between 5 and 8 had a mean Induction-Delivery Interval of 10 hours.

Table 5: Distribution of patients according to period of gestation

Cal	No. of cases	Percentage
Preterm	11	17.8
Term	29	46.8
Post term	22	35.5

Out of sixty-two cases maximum induced patients were at term i.e. 29, post term cases 22 and preterm 11.

Table 6: Relation of duration of pregnancy to induction delivery interval

Weeks of pregnancy	No. of cases	Mean Induction-Delivery Interval (in hours)
32-36	23	8.46
37-40	17	9.00
41 and above	22	6.05

Twenty three cases were in between 32-36 weeks and had a mean Induction-Delivery Interval 8.46 hours and those in between 37 – 40 weeks had a mean Induction-Delivery Interval 9 hours and those above 41 weeks had a mean Induction-Delivery Interval 6.05 hours.

Table 7: Obstetric Outcome

Cal	No. of cases	Percentage
Vaginal delivery	48	78.0
Forceps delivery	8	12.0
Caesarean delivery	6	9.6

Out of 62 cases, 56 progressed to vaginal delivery, out of which 8 cases required forceps extraction and 6 patients required Caesarean section. Failed induction was seen in 2 cases which had a Bishop score of less than 4 at the time of induction. Remaining 4 patients required Caesarean section due to foetal distress or failure of progress of labour.

Table 8: Foetal Outcome

Sr. No.	Groups	No. of cases
1	No. of intrauterine death cases	11
2	No. of cases induced with alive fetus	51
3	No. of alive births	51
4	Birth weight less than 2.5 kg	13
5	Birth weight more than 2.5 kg	49
6	Apgar score in between 4-6	03
7	Apgar score in between 0-3	02
8	Hyperbilirubinaemia – Present	04
	Absent	58

The fetal outcome in our cases was good. Out of 62 cases which were induced 11 cases were of intrauterine fetal death. Apgar score less than 7 was seen in 5 cases. Out of them, 3 babies were having apgar score between 4-6 and 2 babies having apgar score 0-3 which required active resuscitation. Hyperbilirubinaemia was seen in 04 babies which was comparable to physiological jaundice so perinatal mortality in this series was zero percent.

DISCUSSION

Most of the obstetricians agree that for induction of labour, the safe and reliable method of choice is intravenous oxytocin infusion. In our study, sixty two patients of high risk pregnancy were induced. Intravenous oxytocin in drip infusion was used as a method of induction. Patients with a good cervical score (Bishop Score) have labour induced irrespective of the method used. But it has been observed that oxytocin is the most effective inducing agent. In our study, sixty two cases who underwent induction with oxytocin, fifty six had vaginal delivery with a mean induction delivery interval of 10 hours. In our study, failure rate of induction was 28% among patients with very low Bishop score i.e. between 0-4, whereas a score of 5-8 was associated with only 6% failure and almost no failures were observed where score was 9 and above. Thus, intravenous oxytocin infusion is effective and reliable if the cervix is favourable. It was observed that with a low cervical score 0-4, the mean induction delivery interval was high i.e. 15.14 hours and the incidence of Caesarean section was 31.5%, whereas with a score of 9 and above, the mean induction interval was only 8.15 hours. Thus, induction delivery interval was directly related to the pre-induction score. Generally, the concentration of the oxytocin in blood does not increase prior to labour. In active stage of labour, the uterus becomes sufficiently sensitive to the circulatory amount of oxytocin. The effect of oxytocin depends on the number of oxytocin receptors in the uterus. Stimulation with oxytocin is more effective when the gestational age is near term. The effect of oxytocin on the uterus varies greatly from patient to patient. It is a common practice to start oxytocin with a low dose but escalate quickly where there is no response. When the optimal response is achieved, that is uterine contractions

sustained for about 45 seconds and numbering 3 contractions in 10 minutes, the administration of that particular concentration in mu/minutes is to be maintained. The term 'failed induction' was restricted to those cases in which uterus fails to contract with adequate stimulation with oxytocin or the uterus contracts abnormally and the cervix does not dilate completely. Complete failure of uterine action was diagnosed if the cervix did not dilate more than 3 cm after giving 3 oxytocin drips in maximum concentration of 32 milliunits/minute for a period of about 12 to 15 hours.Abnormal uterine activity was deemed to be present if full dilation of the cervix was not achieved despite apparent uterine activity in the absence of cephalo-pelvic disproportion. In this series, out of 62 patients, 6 patients required Caesarean section. Two patients out of six required Caesarean section because of failure of induction. They were having Bishop score 0-4 with mild contraction. Remaining four cases were having abnormal uterine activity and developed fetal distress. Failure rate of induction was 3%. Post-partum haemorrhage is one of the adverse effects caused by oxytocin intravenous infusion. It was prophylactically prevented by continuing the oxytocin drip after delivery in the concentration of twenty units. The fetal outcome in the present study was excellent in terms of fetal well-being. Out of 51 cases, only 5 cases were having Apgar score less than 7. Out of these 5 cases, 2 were having Apgar score in between 0-4 which required active resuscitation. Oxytocin has been implicated as a cause of fetal asphyxia (Wrigly 1959) due to increase uterine tonus or tetanic contractions. Hyperbiliru binemia was seen only in four cases. The incidence of neonatal hyperbilirubinemia was found to increase with both increase in the duration of induction as well as with increase in dose of oxytocin. The incidence of hyperbilirubinemia rose sharply when the total dose of oxytocin administered exceeded 20 units as it did in 12% of the induced labour. In this series, hyperbiliruinemia was observed in those patients having duration of induction delivery more than fourteen hours and requiring more than three drips of oxytocin. Chances of intrauterine infection were more if the induction delivery interval is prolonged. Macllum and Govan (1963) have shown that the incidence of the intrauterine infection is directly related to induction delivery interval. If high dose of oxytocin are infused with larger volumes of dextrose, there is danger of water intoxication (Townsend and Peperrell 1969, Liggins 1962) and a maternal death has been reported from this cause Lillien 1962).Still the immense value of oxytocin in induction is beyond question. So results in our present series were in agreement with Calder *et al* (1975) who stated that side effect of oxytocin are rare except for a possible increased incidence of neonatal jaundice.

SUMMARY AND CONCLUSION

In conclusion, this study shows that for induction of labour with intravenous oxytocin in drip in patients with good Bishop score, the amount of dosage required is less, induction-delivery interval is less, less incidence of failed induction and very few maternal side effects of the drug. Fetal outcome is also good with a very low incidence of neonatal jaundice

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