

ELECTIVE PLANNED INDUCTION OF LABOUR
(Comparison Between Forewater Amniotomy with Oxytocin Infusion and
Forewater Amniotomy Alone as The Method of Choice)

by

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We have preferred elective planned induction of labour as a routine at term in obstetrically normal women against the policy of nonintervention and anticipation of spontaneous onset of labour. The usual schedule is to admit the patients at or near term and prepare them for induction of labour after a complete evaluation. Those patients with normal cephalic presentation alone were considered for elective induction. Those with a previous scar, bad obstetric history and other obstetric complications were excluded from this study and were managed on their own merits.

Term of pregnancy was calculated from the patient's dates and confirmed by the feel of the foetal size, engagement of head, nature of cervix and the nature of bag of membranes. Wherever required, amniotic fluid study for pulmonary maturity, by the bubble stability or 'shake' test described by Clements (1972), was carried out prior to induction.

After confirming that the patient had reached term, labour was induced by forewater amniotomy (A.R.M.), and neither the state of cervix nor the level of pre-

senting part influenced patient management. The first 64 consecutive patients had oxytocin infusion soon after A.R.M., delivered at a rate of 5 mU per minute, till the patient delivered (2.5 units of syntocinon in 600 ml of 5% dextrose infused at a rate of 20 drops per minute). This study of elective induction with ARM and oxytocin infusion in the 64 consecutive subjects was conducted in the Obstetrics Department of the Medical College Hospital, Kottayam, from July 1978 to November 1978 (6 months).

A similar study was initiated in the Department of Obstetrics and Gynaecology, Medical College Hospital, Alleppey. Since February 1980, over a period of 6 months, 105 consecutive patients had elective planned induction of labour. This trial differed from the previous study in only one respect: The method of induction preferred was by forewater amniotomy, and oxytocin infusion was differed unless the patient failed to establish labor contractions within 12 hours of induction.

The purpose of the authors in this presentation is to highlight the many advantages of elective planned induction of labour. This analysis also offers for comparison between the two methods of induction practised. In this respect, it is also our purpose to establish that labour could be induced effectively and conveniently

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with forewater amniotomy alone, and oxytocin infusion should be reserved as an adjunct for only those few patients who fail to establish labour in 12 hours of induction.

Study Group Analysis

In all 169 patients had their labour induced electively at term. First 64 consecutive patients had labour induced by forewater amniotomy (ARM) and oxytocin infusion, and the remaining 105 consecutive subjects were induced by forewater amniotomy alone. Both groups included primigravidae, multigravidae and grand-multigravidae in varying proportions (Table I). When obvious disproportion was ruled out, level of the presenting part was not a criterion, and patients were considered for induction with the head at the brim (mobile), high in the cavity (fixed) and in the cavity (engaged) (Table II). Similarly, the state of the

cervix did not influence patient selection. Labour was induced with the cervix just effaced and admitting one finger, as well with partially effaced cervix admitting 2 fingers easily (2 cm dilatation). Subjects in whom the cervix was almost effaced or completely effaced were also induced by ARM, but were not included in this study since they were considered to be almost in labour and ARM amounted to an active management of labour (Table III).

Overall Results of Elective Induction

Among the 169 patients who were induced labour as an elective planned procedure at term, 160 women delivered vaginally and 9 were delivered by caesarean section, with one foetal loss (still birth) in the vaginal delivery group. All those who delivered vaginally did so within 24 hours from the time of amniotomy, and the induction-delivery interval ranged from 1 hour and 20 minutes to 23 hours

TABLE I
Parity of Patient Undergoing Elective Induction

Parity	A.R.M. & Oxytocin		A.R.M. alone		Total Patients	
	No.	% age	No.	% age	No.	% age
	64		105		169	
Primigravidae	25	39.10	49	46.70	74	43.80
Para 2 to 4	34	53.10	51	48.60	85	50.30
Para 5 & above	5	7.80	5	4.70	10	5.90

TABLE II
Level of the Present Part

Presenting part (Vertex presenting)	A.R.M. & Oxytocin		A.R.M. alone		Total Patients	
	No.	% age	No.	% age	No.	% age
	64		105		169	
At the brim (mobile)	15	23.40	25	23.80	40	23.70
High in the cavity (fixed)	40	62.50	55	52.40	95	56.20
In the cavity (engaged)	9	14.10	25	23.80	34	20.10

TABLE III
Nature of the Cervix

Nature of cervix	A.R.M. & Oxytocin		A.R.M. alone		Total patients	
	64		105		169	
	No.	% age	No.	% age	No.	% age
Just effaced (1 cm)	47	73.40	70	66.70	117	69.20
Partially effaced (2 cm)	17	26.60	35	33.30	52	30.80

and 30 minutes, with a mean of 10 hours. Labour was assisted by vacuum in 9 patients and by outlet forceps in 3 patients. About 80 per cent of the patients delivered within 12 hours of induction and 92 per cent by 18 hours.

Birth weight of the babies born of elective induction ranged from 2 to 3.9 kg., with a mean of 2.9 kg. There was no perinatal loss due to prematurity, and this is attributable to the liberal application of amniotic fluid study in the doubtful cases. Amniotomy revealed meconium staining of the amniotic fluid in 14 subjects, and in those cases any slightest alteration in the foetal heart rate or any tendency for protracted labour was considered an indication for caesarean section. Among 9 inductions ending in abdominal deliveries, 3 were done for foetal distress, 2 for cephalopelvic disproportion detected after induction, and only 4 caesarean sections were directly due to failure of the induction procedures.

Considering the complications, cord prolapse resulting from amniotomy in 2 patients was the only type of problem encountered in this series of 169 patients. Of the 2 cases of cord prolapse, 1 ended up in still birth, which was the only perinatal loss in this entire series, and the other patient was delivered by vacuum of a live baby. There were no other complications, especially, the blood loss was with-

in normal limits in all subjects, and there were no placental problems and post-natal complications.

Comparative Analysis of the Two methods of Induction

The two method of induction were practised in a consecutive group of 64 patients (ARM and Oxytocin), and another consecutive series of 105 patients (ARM alone), without any relevance to the parity, level of the presenting part nor the state of the cervix. It was realised that the induction-delivery interval was shorter in the ARM-Oxytocin induced group, with a mean of 8 hours and 45 minutes (range—1 hour 30 minutes to 23 hours 10 minutes) compared to the subjects induced by amniotomy alone whose mean duration was 13 hours (range—1 hour 20 minutes to 23 hours 30 minutes). Among the 64 patients in the former group, 62 had vaginal delivery, and 2 subjects underwent caesarean section. By contrast, of the 105 patients induced by amniotomy alone, 89 delivered normally, 9 required oxytocin infusion for acceleration of labour, and 7 were delivered by caesarean section.

However, as indicated in Table IV, the cumulative delivery rate showed only trivial difference in the two groups at 12 hours. By employing oxytocin infusion as an adjunct when the patient failed to get

TABLE IV
Cumulative Delivery Rate

Induction Delivery interval	Number and percentage delivered	
	A.R.M. & Oxytocin	A.R.M. alone
6 hours	26 (41.90%)	25 (25.50%)
12 hours	50 (80.60%)	78 (74.50%)
18 hours	61 (98.30%)	87 (88.80%)
24 hours	62 (100%)	98 (100%)

induced by ARM within 12 hours (which was required only in 9 patients), the delivery rate could be improved in this group. The end result was quite satisfactory in both groups, with all those delivering normally doing so within 24 hours.

Since there is not much difference in the number of patients delivering at 12 hour in either groups, and since continuous oxytocin infusion is inconvenient and requires more careful attention of the patient, it is observed that ARM alone is good enough as the method of elective planned induction of labour. Oxytocin need be used only in those few occasions where labour is not established within 12 hours of induction by ARM. It also should be pointed out that the perinatal outcome and the maternal well-being are identical in both the groups.

Discussion

If the criteria for patient selection are strictly adhered to, elective planned induction of labour can be recommended as a routine procedure in obstetric practice with much of advantage to the patient as well as the physician. The procedure seems to be safe for the foetus and reduces the problem of prolonged pregnancy attended with high rate of perinatal loss. Commenting on the popularity of elective induction Greenhill (1974) points out that the patient is emotionally and physically prepared and she has the advantage of

the better equipped and better staffed day time hospital services. In our study, after detailing the patient and her relatives, induction is planned in the morning at about 8 A.M. With a short induction-delivery interval (mean—10 hours), about 80 per cent of the patients had delivered in the daytime, within 12 hours of induction.

Induction of labour at term allows for inspection of the nature of liquor which influence the foetal outcome. Walker (1954) drew attention to the presence of meconium in amniotic fluid which may indicate the need for a very careful watch on the foetal heart rate. As a potential sign of foetal distress, presence of meconium can forewarn the foetal status and be of a guidance in the further management of the patient. Among the 169 women undergoing elective induction at term, 14 subjects had meconium in the amniotic fluid (8.3%), and 2 of them were delivered by caesarean section.

The low perinatal mortality in this series is commendable, and there was only 1 foetal loss (0.6%) for 169 deliveries. The improved foetal outcome is attributable to confirmation of foetal maturity by amniotic fluid study in the doubtful cases and moreover to the procedure of elective induction at term avoiding the risk of prolonged pregnancy. Cole *et al* (1975) has proved that elective induction brings about substantial reduction in the perinatal mortality and recommend this procedure as the best management of labour. Similar opinion has been expressed by Pinkerton *et al* (1975) in their series of selective planned induction.

The only foetal loss was a case of still birth due to prolapse of the umbilical cord. The incidence of cord complication following amniotomy has been reported to range from 0.06 per cent to 3.70 per cent (Gibson, 1952; Tennant and Black,

1954; Parker, 1957 and Evans, 1954). However, provided that the foetal head is in the pelvis and well applied to the lower uterine segment, that forewater puncture is employed and the head is not displaced during the operation, the risk of a prolapsed cord is negligible. No other complications such as excessive blood loss, and infections were encountered in our series.

Many investigators (Brown *et al*, 1973; Cole *et al*, 1975) have preferred induction of labour by forewater amniotomy and oxytocin infusion. However, our comparative analysis of the two methods of induction, namely, forewater amniotomy with oxytocin infusion and forewater amniotomy alone, does not have many favourable aspects to commend amniotomy with oxytocin infusion as the best method of induction. Eventhough the average duration of labour was reduced by oxytocin infusion there was only trivial difference in the number of patients delivering in 12 hours in either group (Table IV). Of the 105 women induced by amniotomy alone, only 9 (8.60%) failed to establish labour contractions within 12 hours of induction, and this group was treated with oxytocin infusion with favourable results. In either group, all those who delivered vaginally did so within 24 hours. By avoiding oxytocin infusion as a routine procedure and reserving the same for the few patients who fail to respond to amniotomy alone, we feel that the inconvenience caused by oxytocin infusion and its possible complications could be averted, without, however, affecting the efficacy of the procedure and the perinatal outcome. Keetel (1968) has reported excellent results for elective induction by amniotomy alone, and in his series only 3 per cent required oxytocin to initiate contractions.

While forewater amniotomy proves to

be an effective and safe method of elective induction of labour, the recent reports of neonatal hyperbilirubinaemia associated with oxytocin induction does not favour the routine use of oxytocin for elective induction. Chalmers *et al* (1975) found a highly significant increase in the incidence of hyperbilirubinaemia in neonates of mothers whose labours were induced by oxytocin. Beasley and Alderman showed that (1975) proportion of babies developing hyperbilirubinaemia was directly related to the total dose of oxytocin used.

Conclusion

Elective planned induction of labour at term in patients with no obstetric or medical complications appears to be the ideal obstetric management of recent times. By adhering to strict criteria elective induction offers for a safe and quick delivery with improved perinatal outcome. It also adds to the convenience of the patient and the physician.

As the method of induction of labour, forewater amniotomy (ARM) alone appears to be the most suitable method, and the authors feel that oxytocin infusion should be reserved for the few patients who fail to establish labour contractions within 12 hours of induction.

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