

SELECTION OF METHOD FOR INDUCTION OF LABOUR

By

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SUMMARY

One hundred nulliparae underwent induction of labour by either oxytocin stimulation, or artificial rupture of membranes (ARM), or extraamniotic PGE₂ gel (PGE₂), or stripping of membranes (Sweeping) assigned by random sampling with replacement. Modified Bishop's cervical scoring was carried out prior to induction and was referred as 'zero hour' score. The post induction progress of labour was monitored by partogram. The ease with which labour can be induced depends upon 'zero hour' score; so also the induction delivery interval ($P < 0.05$). The incidence of failed induction was highest for 'zero hour' score 0-3. In order to get a favourable predictable outcome in relation to time and cost, PGE₂ was found to be the most acceptable method of induction for 'zero hour' score 0-3. Oxytocin or ARM was cost effective for 'zero hour' score 4-6; whereas sweeping only produced desirable results for 'zero hour' score 7-10.

Introduction

History reveals use of many methods to induce labour. Out of them artificial rupture (ARM) and stripping (sweeping) of membranes are long established means of induction. The recognition of the oxytocic activity of the posterior pituitary extract and the successful introduction of the 'The Pitocin Drip' (Theobald *et al* 1948) represented a significant advance in technique. The discovery of prostaglandins and their action on intact human uterous opened a new exciting era (Euler, 1935; Karim *et al* 1968). One of the factors that influences most, the successful induction of labour, is the

state of uterine cervix, aptly represented by the cervical score (Bishop, 1964, Turnbull, 1968).

The present study was undertaken to assess the predictive value of preinduction cervical score in relation to duration of labour. Also, to formulate a system of selecting individually four different induction methods according to the preinduction score, in order to make the selected method cost effective.

Material and Methods

The present study has been carried out on one hundred nulliparae admitted for confinement. The patients were allotted any one method of induction viz; sweeping, ARM, oxytocin drip or extraamniotic PGE₂ gel by random sampling

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with replacement. Details of clinical history and general, physical and obstetrical examination were carefully noted. Prior to induction cervical scoring in each patient was carried out according to modified Bishop's scoring system (Ulmsten *et al* 1982). This was referred to as 'zero hour' score and had a possible range of 0-10. Standard procedures were adopted for performing sweeping, ARM, oxytocin and PGE₂ gel application. The maximum dose of oxytocin infused was 15 mili units/minute. The doses of PGE₂ used was 0.5 milligrams in a starch based viscous gel. The induction was termed as failed if the patient failed to go in labour within six hours of induction.

Observations

One hundred cases were studied and all were nulliparae. The indication for induction are shown in Table I. But for two cases, all had normally formed fetuses and there were no multiple pregnancies. The details of various methods of induction allotted to the patients are shown in Table II. There were a total 10 cases of failed induction. Eighty per cent had a 'zero hour' cervical score range of 0-3 (Table III). Out of these ten cases, in 60%, induction was done by sweeping.

TABLE I
Showing Indications for Induction

Indication for induction	No.
Past term	56
Pre eclampsia	38
Weight loss at term	4
Congenital anomaly	2
Total	100

TABLE II
Showing Number of Cases for Different Methods of Induction

Method of induction	No.
Artificial rupture of membranes (ARM)	23
Oxytocin	30
PGE ₂ gel	24
Stripping of membranes (sweeping)	23
Total	100

TABLE III
Shows Cases of Failed Induction in Relation to Cervical Score

'Zero hour' score	No.
0-3	8
4-6	2
7-10	—

A negative correlation was observed between 'zero hour' score and mean induction delivery interval (IDI). The correlation was found to be statistically significant ($r = -0.362$; $P < 0.05$). Implying thereby, that an inverse relationship exists between 'zero hour' score and mean IDI (Table IV). An analysis of IDI and 'zero hour' score divided into three ranges for different methods of induction is shown in Table V. Labour

TABLE IV
Shows Relationship Between 'Zero Hour' Score and Mean IDI

'Zero hour' score	IDI (hours) Mean \pm S.D.
2	10.5 \pm 3.38
3	15.77 \pm 7.59
4	15.17 \pm 6.30
5	14.04 \pm 6.51
6	12.10 \pm 8.32
7	10.9 \pm 2.3
8	8.8 \pm 4.2
$r = -0.362$	$P < 0.05$

TABLE V
Shows Relationship Between IDI 'Zero Hour' Score and Method of Induction

Zero Hour Score	IDI (Mean \pm S.D.) hours			
	PGE ₂ gel	Oxytocin	ARM	'Sweeping
0-3	14.3 \pm 9.07	15.4 \pm 3.6	16.0 \pm 0.68	20.54 \pm 1.6
4-6	13.4 \pm 7.9	14.2 \pm 3.4	14.46 \pm 6.2	14.5 \pm 3.2
7-10	—	10.5 \pm 1.6	12.0 \pm 2.26	12.86 \pm 6.56

was completed in shortest period of time by PGE₂ for 'zero hour' score 0-3. For the 'zero hour' score 4-6 oxytocin/ARM produced satisfactory result with a lesser cost within comparable period of time. Sweeping gave equally satisfactory mean IDI for 'zero hour' score 7-10.

Discussion

In spite of newer and improved methods of induction, the selection of method of induction is perhaps, influenced more by the prevailing practice in the individual institution, rather than the consideration for time and cost.

The incidence of failed induction was 80% for 'zero hour' score 0-3. The inducibility failure rate falls steeply for scores 4 or more (Table III). Turnbull (1968) demonstrated that the successful induction of labour was dependant on the period of gestation, parity and cervical score. Burnett (1966) and Calder *et al* (1974) using different methods of induction have concluded that preinduction cervical score is the most important factor for successful induction. The mean length of labour has consistently been found to be significantly longer with poorer 'zero hour' scores by various authors (Friedman *et al* 1966, Jagani *et al* 1982, Gibb *et al* 1985). From Table IV it is evident that a statistically signi-

ficant negative correlation was observed between 'zero hour' score and mean IDI ($r = -0.362$, $P < 0.05$), establishing an inverse relationship between 'zero hour' score and mean IDI.

An appraisal of Table V shows that in order to obtain a favourably predictable outcome, both in relation to time and cost, PGE₂ was found to be most acceptable method of induction for 'zero hour' score, 0-3. Oxytocin or ARM was cost effective for 'zero hour' score 4-6, and sweeping only produced desirable results for 'zero hour' score 7-10. The explanation to this significant observation can be attributed to the ability of prostaglandins to effectively and promptly terminate pregnancy at any stage of gestation (Embrey, 1975). Prostaglandins have also been used with success for cervical ripping when the cervical condition is unfavourable (Mackenzie and Embrey, 1977). Comparable results can be achieved, as our study shows, by oxytocin or ARM when the cervical score is more favourable.

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