ORIGINAL ARTICLE

Role of Foley's Catheter to Improve the Cervical Score prior to Induction of Labour

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Abstract

Present study was conducted on 40 patients to assess the role of Foley's catheter in improving cervical score prior to induction of labour. Patients consisting of primigravidae and multiparae, requiring induction of labour for various conditions—postmaturity, pre-eclampatic toxaemia, intrauterine growth retardation, pregnancy with bad obstetrical history were included in the study. Each patient was subjected to cervical scoring by Bishop's score prior to and after the procedure. Foley's self retaining catheter No. 20 was inserted extramniotically upto the level of internal os and was removed after 24 hours. It was found that Foley's catheter improved the cervical score to 10.50 ± 2.17 with mean induction–delivery interval of 9.72 hours.

Key words

Cervical ripening, Foley's catheter, Induction of labour.

Introduction

Acknowledgement of the cervix as a functional organ is one of the major advances in reproductive physiology. The uterus must remain closed during pregnancy to maintain the pregnancy, yet open during parturition. It must perform its activity at the right time and in the right sequence within a reasonable period of time. The process that co-ordinates these activities is labour and it is an equal mixture of uterine contractions, cervical effacement and dilatation.

In 1964, Bishop was the first to attempt to quantify the physical examination of the cervix by introducing a numeric scoring system. The scoring consisted of a summation of the observations dealing with the conditions of dilatation, effacement, consistency and position of the cervix as well as station of the presenting part. Each of these five pelvic findings is evaluated and scored and total of all five constitutes a guide for determining the proximity to the onset of labour. When a high score is present, it is asumed that those changes that constitute cervical ripening have occured and no further attempts to ripen the cervix are needed. It is concluded that cervical priming would be especially beneficial in patients with a cervical score less than 4, if delivery is desired. Finally, of all the Bishop scoring parameters, it has been found that dilatation weighs the most in importance and position of cervix weighs the least in determining the predictability of the score (1).

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There are numerous occasions, when there is a specific indication for induction of labour because of maternal or fetal complications, the initiation of labour is achieved by artificial means. The physical and biochemical changes in the uterine cervix and lower segment which normally precede the onset of parturition, are frequently referred to as ripening and seem to be essential to normal labour and delivery. Induction of labour, when the uterine cervix is unripe, is associated with frequent maternal complications and high rates of induction-failure and caesarean delivery (1,2). Numerous techniques have been attempted to ripen the unfavourable cervix and enhance the changes necessary for labour in the lower uterine segment (3,4). Although systemic or local administration of "ripening" hormones (oxytocin, prostaglandins etc.) have gained wide-spread use in recent years, mechanical methods for cervical ripening are less popular. Experience with the former methods (primarily prostaglandins) suggests that the remarkable success rates may be associated with significant, lethal, untoward effects on the mother, fetus or newborn (5,6).

Material and methods

The present study was conducted in the department of obstetrics and gynaecology, S.M.G.S. Hospital, Government Medical College, Jammu. Total number of 40 cases consisting of 20 primigravidae and 20 multiparae requiring induction of labour for various conditions (postmaturity, pre-eclamptic toxaemia, intrauterine growth retardation, pregnancy with bad obstetrical history) were included in the study.

The duration of procedure was 24 hours. Patients with clinically assessed contracted pelvis, history of bleeding per vaginum any time during pregnancy, cervical dilatation more that 2.5 cms were not included in the study.

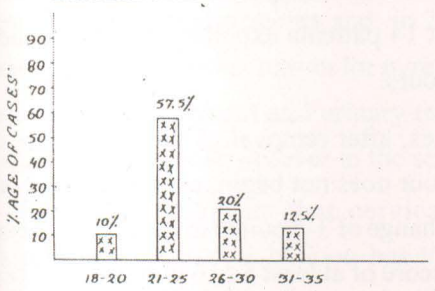
Each patient was subjected to cervical scoring by Bishop's score prior to the procedure. In pre-treatment Bishop's scoring all the five factors like dilatation, effacement, position of cervix, consistency of cervix and the station of head in relation to ischial spines, were noted. Patients having cervical dilatation more that 2.5 cms and Bishop's score more than 4 were not taken for induction. Foley's self-retaining catheter–No. 20 with 30-50 cc capacity of balloon was used. The vaginal portion of the uterine cervix was exposed with a sterile speculum and cleaned thoroughly with antiseptic solution. Under direct vision, catheter was inserted through the external cervical os, and the balloon inflated with 35 cc of distilled H_2O and catheter was kept in place by applying sticking plaster over it on the thigh of patient. Patients were put on broad spectrum antibiotics after that. Continuous monitoring of fetal heart sounds at short intervals was done and maternal blood pressure and pulse rate were recorded throughout. After 24 hours catheter was taken out by deflating the balloon and again cervical scoring was done. If there was significant improvement in cervical score, artificial rupture of membranes was done (except in those cases where head was not fixed) and syntocinon drip was started (2.5 units in 5% dextrose). But patients who had already started with labour pains, drip was not given.

Outcome of labour was noted as normal vaginal delivery, forceps application or lower segment caesarean section. Induction delivery interval was also noted. Newborn babies Apgar score was observed. Complications, if any, were recorded.

Results

In this study the maximum number of patients (77.5%) belonged to age group 21-30 years. Youngest patient was 18 years old and the oldest was of 35 years of age. The mean gestational age in this study was 40.27 ± 2.54 weeks.

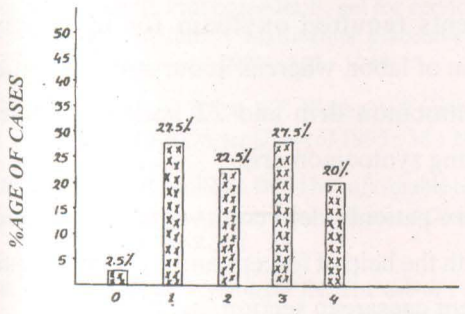
DISTRIBUTION OF CASES ACCORDING TO AGE



It was seen that postmaturity was a major indication for cervical ripening 23 cases (57.5%). Pre-eclamptic toxaemia formed another group 13 cases (32.5%), there was one case of intrauterine growth retardation (2.5%) and 3 cases of bad obstetrical history (7.5%).

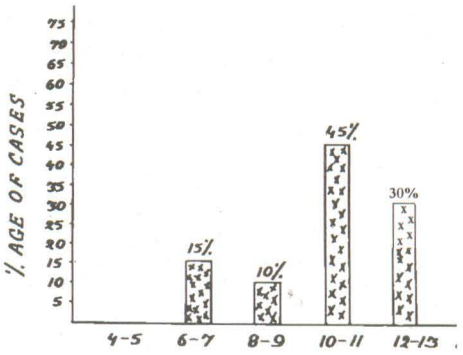
On assessment of pre-treatment Bishop's scoring, it was observed that all the cases had cervical scoring from 0-4. Bishop's score of 0-2 was observed in 52.5% of cases whereas 47.5% had a Bishop's score of 3-4.

DISTRIBUTION OF PATIENTS ACCORDING TO PRE-TREATMENT BISHOP'S SCORE



Maximum patients after inserting in Foley"s catheter gained score between 10-11, while there was no patient below score 6. Fifteen percent were having score 6-7, 10% between 8-9, 45% between 10-11 and 30% between 12-13. In total 75% of the cases had cervical scoring between 10-13, while 25% failed to achieve scoring over 9. Mean post-treatment Bishop's score was 10.50.

DISTRIBUTION OF PATIENTS ACCORDING TO POST-TREATMENT BISHOP'S SCORE



In 26 patients (65%) catheter was removed after 24 hours and 14 cases (35%) expelled it of their own before 24 hours. In 25 patients artificial rupture of membranes (ARM) was done after completion of the procedure at 24 hours, in 5 patients ARM could not be done due to technical difficulty and instead syntocinon drip was started where as 10 patients ruptured their membranes spontaneously before 24 hours.

Forty-five percent of the patients were given syntocinon drip, whereas, 55% delivered on their own without getting syntocinon drip. Mean induction delivery interval was 9.72 hours. Maximum patients (26) delivered vaginally, 8 patients required forceps and in 6 patients lower segment caesarean section was done.

Post-delivery complications

Two patients had pyrexia because of urinary tract infection and breast engorgement. One case was of retained placenta, one para-urethral tear and 2 cases were of vaginal tears.

Discussion

For successful elective induction, state of the uterine cervix is of paramount importance. Hence to improve the state of cervix, over the years a variety of locally

applied physical ripening agents have been evaluated (3,7). The use of a Foley's catheter to effect cervical ripening was first described by Embray and Mollison in 1967 (8). They used a 26-gauge catheter, modified by removal of the tip and inflated with 50 ml of sterile water above the internal cervical os. Subsequent studies evaluated catheters of various diameters (14-26 gauge) and balloon sizes (30 cc, 40 cc, 50 cc and even 70-80 cc). In our study, we used Foley's self retaining catheter of 20 gauge inflated with 35 cc of water. However, it may be argued that larger balloon volumes are more likely to displace the presenting part, but achieve only a minor increase in diameter.

After putting in balloon, some studies suggested that patients activity may be unrestricted (8-10) while some advocated bed rest and use of traction 0.5 kg on the catheter (11), strapped it to the midtibial region and instructed the patient to keep the knee extended (12), where as in present series, the catheter was kept in place by applying sticking plaster over it on the thigh of the patient. The mechanism by which Foley's catheter improves the cervical state is by its mechanical action. It strips the foetal membranes from the lower uterine segment, causing rupture of lysosomes, release of phospholipase A and formation of prostaglandins. Human studies have measured increased prostaglandin concentration in amniotic fluid (13) and maternal plasma (14) during balloon-induced cervical ripening.

Exact time period for which balloon is to be kept inside is not always known, but a variable time period is allowed for spontaneous expulsion, adequate ripening or the establishment of labour. In some studies the balloon is removed after 8 to 15 hours (9,10,12,15-18), others wait until it falls or pulls out (8,11,12,19,20).

In our series, balloon was kept inside the cervical canal for 24 hours, but 14 patients expelled catheter of their own before 24 hours.

In some studies, after removal of the balloon or its expulsion, if labour does not begin, cervical conditions are assessed. A change of 3-4 points in the cervical score (15,16,21), or a score of at least 5 to 6 points (21,22) are sometimes required before induction of labour and if cervical score criteria have not been met, reinsertion of balloon cathether or use of another method of cervical ripening is done. In our study post treatment Bishop score according to parity showed that maximum number of primigravidae-15, as well as 25 multigravidae showed cervical scoring between 10-13. In no case reinsertion of the catheter was done, nor any other method for cervical ripening was used.

In a study, where ripening of the unfavourable cervix was done with extraamniotic catheter balloon, Dan J Sherman and others (23) suggested that 60-70 percent of the patients required oxytocin for induction or augmentation of labor, whereas in our study 18 patients required syntocinon drip and 22 patients delivered without getting syntocinon drip.

Twenty-six patients delivered vaginally, 8 patients delivered with the help of forceps and 6 patients required lower segment caesarean section.

Most series report very few side effects of cervical ripening by a Foley's catheter balloon : the most common are intrapartum or postpartum fever and vaginal bleeding after insertion (8,15,16,18,19). Less frequent side effects include rupture of the membranes, displacement of the presenting part or umbilical cord prolapse (21). Some series also reported minor side effects such as nausea and vomiting (19), pain or discomfort (17,20). In our

study 2 patients had vaginal tears, one had paraurethral tear, 1 had retained placenta and in 2 patients pyrexia was seen. The obvious reason for pyrexia in one patient was breast engorgment and urinary tract infection was diagnosed as a cause of fever in the second patient.

This study suggests that cervical ripening with extraamniotic catheter balloon has the advantages of being effective, simple, economical and with lack of local or systemic serious side effects.

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