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Cervical ripening and induction of labour by breast stimulation*

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Summary

The value of gentle, unilateral breast stimulation in the ripening of cervix and induction of labour was studied. Three hundred patients with uncomplicated term pregnancies, (38-42 weeks) were recruited into the study, consisting of three separate randomised double blind prospective trials.

The first trial was to evaluate the effectiveness of breast stimulation in ripening the cervices of 200 term primigravid patients. There was a mean change of 3.90 ± 2.39 points in cervical score among the study group compared to 0.50 ± 0.67 among the control group. Thirty-three per cent of the study group went into labour when compared with 4% among the control group. In a second study of cross-over trial involving 78 of the original 200 patients, the study (ex-control) group had a mean change in cervical score of 3.84 ± 2.24 when compared with the control (ex-study) group, (1.43 ± 1.08).

In a third study involving 100 multiparous patients, a mean change in cervical score of 2.74 ± 1.16 was observed in the study group when compared with the control group, 0.92 ± 1.07.

Forty-six per cent of the patients went into labour compared with 12% in the control group. All findings were highly significant and there were no maternal or fetal side-effects.

The study confirmed the efficacy of breast stimulation in cervical ripening and induction of labour.

Resume

Au cours de ce travail, on a etudie la valeur qu'une gentiile stimulation uni laterale des seins aura dans la maturation du col de l'uterus aussi que dons la production des couches d'engant. L'etude, qui a comporte trois essais separes, faits au hasard et pratiques a l'insu des patientes et des medecins, a ete basee sur 300 patientes qui ont eu des termes sans complications (38 a 42 semaines).

Le premier essais a ete pur evaluer l'efficacite de la stimulation des seins dans la maturation des cols de l'uterus de 200 patientes enceintes pour la premiere fois. Lors de l'essais on a obtenu un changement moyen de 3.90 ± 2.39 dan les points cervicaux du groupe de travail par rapport a celui de 0.50 ± 0.67 obtenu dans le groupe de controle. 33% des patientes du groupe de travail ont commence a sentir des douleurs de l'enfantement par rapport au 4% du groupe de controle.

Lors d'une deuxieme etude comportant un essais croise base sur 78 du groupe original de 200 patientes, le groupe de travail (excontrole) a donne un changement moyen de 3.84 ± 12.24 dans les points cervicaux par rapport a celui de 1.43 ± 1.08 du groupe de controle. (ex-travail).

Dans une troisieme etude basee sur 100 patientes, ayant deja un enfant ou bien enceintes pour la deuxieme fois, un changement moyen des points cervicaux de 2.74 ± 1.16 a ete observe par rapport au 0.92 ± 1.07 du groupe de controle.

46% des patientes ont commence a sentir les douleurs de l'enfantement par rapport a 12% dans le groupe de controle.

Tous les resultats de cette recherche ont ete tres significatifs et il n'ya eu aucune contre-reaction maternales ou fetales L'etude a confirme l'efficacite de la stimulation des seins dans la maturation cervicale et dans la production des couches d'enfant.

Introduction

The state of the cervix has long been known to

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influence the outcome of induction of labour[1]. This is because cervical dilation during labour is closely related to the concentration and physical state of cervical collagen[2]. When the cervix is ripe[3], there is a greater chance of having a successful induction and the duration of labour is short[4]. The converse is also true. When the cervix is unripe, induction is technically difficult and labour is prolonged[5].

There are many methods for improving the state of the cervix[6,7,8]. The use of extra-amniotic application of PGE_2 was confirmed to be superior to many other methods[9]. However, it is expensive and relatively difficult to obtain in Nigeria. All the methods involve the introduction of foreign bodies or drugs, and, are not natural to the body's physiology. It has long been known that putting an infant to the breast is often associated with uterine contraction. Caldeyro-Barcia *et al*[10] noted that the uterine contractions obtained with breast stimulation were similar to those recorded during oxytocin administration. Several workers have recorded successful ripening of the cercix using breast stimulation[1,3,11], and a significant number of patients under study had established labour and delivered[12].

Breast stimulation is cheap and natural. It activates endogenous release of oxytocin and has been recommended for use in populations where highly parous patients abound. A striking absence of breast engorgement and a plentiful secretion of milk were observed by some workers[12]. Although relatively free of complications, there is a potential problem of uterine hyper-stimulation, especially when both breasts are stimulated[11].

Encouraged by the success of many workers[12,3,11], coupled with shortages and high cost of medicare due to economic adjustment, we have decided to look at the relevance of breast stimulation in promoting cervical ripening and subsequent induction of labour among our obstetric population. The study consisted of three separate randomised double blind prospective trials, designed to evaluate the effectiveness of gentle unilateral breast stimulation in the ripening of cervix and induction of labour in patients with uncomplicated pregnancies. Since there are no reports of previous studies among the African population, the outcome will enable us to make recommendations about its effectiveness or otherwise in our environment.

Materials and methods

Three hundred patients, comprising of two hundred primigravidae were recuited into the study. They were all at term (38-42 weeks gestation). The purpose of the study, as a means of evaluating certain changes in their birth canal, was explained to them and consent was obtained.

The first trial was to evaluate the effectiveness of breast stimulation in ripening the cervices of term primigravid patients. The two hundred patients recruited were randomly assigned to treatment or control groups, based on a table of random numbers. The cervical score was evaluated at the beginning of the study, using a modified Bishop's Score, having a maximum of ten points with two points allocated to each of the five parameters (Table 1). The patients and scoring obstetricians were blind to the allocation.

Table 1: Modified bishop's score

	POINTS		
Parameters	0	1	2
Dilation	0 cm	1 - 2 cm	3 - 4 cm
Effacement	0-3%	40-50%	60-70%
Consistency	Firm	Medium	Soft
Position	Posterior	Axial	Anterior
Station	-3	-2	-1

The patients in the study group were instructed to gently draw out the nipple intermittently for a period of one hour daily for three days while lying on the bed. The cervical score was reassessed after three days. The three days study period chosen arbitrarily was in line with previous studies, while a stimulation period of one hour daily was based on a result of a pilot study conducted by one of us[1]. Patients in the control group were instructed to avoid stimulation of their breasts while all patients were asked to avoid sexual intercourse. At the end of three days a cross-over trial was conducted to determine the long-term effect (if any) of breast stimulation in ripening the cervix. The study (breast stimulation) group became control, while the control group became the study group. The same instructions, as before, were given and the cervical scores were evaluated after three days.

The third trial was conducted in a population of multiparous patients. One hundred patients were

recruited in all, and, assigned to study and control groups. The cervical score was assessed as before on day one and after 3 days. The objective was to study the efficacy of breast stimulation in multiparous patients. The data were analysed and statistical significance between the two groups compared using X^2 test.

Results

The results of the trial were shown in Tables 2, 3 and 4. In the first trial, the mean change in cervical score for the study group was 3.90 ± 2.39 compared with 0.50 ± 0.67 for those in the control group. Thirty-three per cent of the patients in the breast stimulation group went into labour, while 4% of the patients in the control group commenced labour within three days of commencement of study. These were statistically significant (P 0.05). There were no statistically significant differences in maternal age, fetal birth weight and Apgar score.

Table 2: First trial (Primigravidae)

Parameters	Study Group (± SD)	Control Group (± SD)	Level of Significance
Total Number	100	100	
Age (Yrs.)	23.19 (2.27)	24.08 (2.46)	NS
Gestational Age (weeks)	39.60 (1.02)	40.20 (1.12)	NS
Initial Bishop's Score	4.30 (0.78)	4.70 (0.64)	NS
Change in Bishop's score	3.90 (2.39)	0.50 (0.67)	S
No. in Labour	33 (33%)	4 (4%)	S
Birth Weight (gm)	3.05 (0.25)	3.16 (0.33)	NS
Apgar Score			
1"	7.80 (0.98)	8.10 (0.83)	NS
5"	9.80 (0.40)	9.70 (0.64)	NS
No. with Postpartrum Haemorrhage	1 (1%)	4 (4%)	NS

Table 3: Cross-over trial (primigravidae)

Parameters	Breast Stimulation Control (± SD)	Control Breast Stimulation (± SD)	Level of Significance
Total Number	41	37	
Age (Yrs.)	23.73 (2.28)	23.92 (2.41)	NS
Initial Bishop's Score	6.46 (1.25)	4.32 (1.49)	S
Change in Bishop's score	1.43 (1.08)	3.84 (2.24)	S
No. in Labour	18 (43.9%)	15 (40.5%)	NS
Apgar Score			
1"	8.24 (1.03)	8.35 (0.81)	NS
5"	9.80 (0.45)	9.78 (0.47)	NS
Birth Weight (gm)	3.12 (0.17)	3.10 (0.17)	NS
No. with Postpartrum Haemorrhage	—	—	

Table 4: Third trial (multiparous patients)

Parameters	Study Group (± SD)	Control Group (± SD)	Level of Significance
Total Number	50	50	
Age (Yrs.)	27.72 (2.82)	28.43 (3.14)	NS
Parity	3.84 (1.01)	3.94 (0.95)	NS
Gestational Age (weeks)	39.92 (0.87)	39.80 (0.98)	NS
Initial Bishop's Score	6.00 (1.23)	6.54 (1.32)	NS
Change in Bishop's Score	2.74 (1.16)	0.92 (1.07)	S
No. in Labour	23 (46%)	6 (12%)	S
Apgar Score			
1"	7.90 (0.70)	8.0 (0.84)	NS
5"	9.46 (0.70)	9.60 (0.69)	NS
Birth Weight (gm)	3.27 (0.19)	3.36 (0.20)	NS
No. with Postpartrum Haemorrhage	0 (0%)	5 (10%)	S

At the onset of the second trial, the number of patients had reduced considerably by exclusion of patients who went into labour and those who defaulted. Seventy-eight patients comprising 41 control (ex-study) and 37 study (ex-control) were recruited into the study (Table 3). The control (ex-study) group had a significantly higher mean cervical score 6.46 ± 1.25 than the study (ex-control) group 4.32 ± 1.49. After three days of breast stimulation, the new study group had a statistically significant change in cervical score 3.84 ± 2.2 compared with 1.43 ± 1.08 (P 0.05) for the control group. Eighteen of the control group went into labour compared with 15 among the breast stimulation group. The significant number of ex-treatment group that went into labour could only be explained by a residual effect of the breast stimulation.

The third trial involved multiparous patients. Their age, parity and gestational age (weeks) were not significantly different. There was a significant mean change 2.74 ± 1.16 in cervical score, compared with control group 0.92 ± 1.07. Forty-six per cent of the patients went into labour compared with 12% in the control group. These were equally significant (P 0.05). The Apgar score and birth weights of the control and the study groups for the various trials did not show any statistically significant difference. No multiparous patient in the study group had postpartum haemorrhage, whereas 10% in the control group had significant postpartrum haemorrhage.

Discussion

The association between successful induction of labour and ripening of the cervix is long established[13]. An unripe and hence unfavourable cervix is associated with poor outcome of induction[14]. Any method devised to improve the state of ripeness of the cervix is therefore of tremendous obstetric value.

Of the various methods available for cervical ripening and induction of labour, breast stimulation is the only one that is natural to the physiology of the human body and cheap. The use of Foley's catheter, oxytocin, estrogen and laminaria tents may be associated with complications. Breast stimulation activate the endogenous pathway of oxytocin release. Although the exact mechanism for ripening of cervix is not exactly known, oxytocin causes depolarisation of cell membrance potential and alter permeability to sodium[15].

The result of this study, the largest ever reported agrees with those of other workers[12,3,11]. In primigravid patients, unilateral breast stimulation causes ripening of cervix and a significant proportion, 33% in this study, compared with 4% in the control went into labour. The cross-over trial indicated, as found by Salom *et al*[11] that there is a carry over of the effect of breast stimulation. This is in contrast to the finding of Elliot and Flaherty[3]. In multiparous patients, a similar trend of increase in mean cervical score ws obtained. 45% of patients in the study went into labour compared with 12% in the

control group. The method is therefore of tremendous value in this group of patients who are prone to significant risk when infused with oxytocin. The result also indicated some potential protective effect against post-partum haemorrhage.

While recommending it in our practice, it appears to have a possible drawback of being slow and could be subjected to abuse by patients who otherwise would have demanded for social induction. We avoided the danger of uterine hyperstimulation by warning against bilateral breast stimulation[16,17]. We also avoided telling our patients that the objective was to evaluate the possibility of inducing labour as this could generate undue enthusiasm. In all, there were no maternal or fetal side-effects. The study confirmed the efficacy of breast stimulation in cervical ripening and induction of labour. It is cheap, natural and does not require additional monitoring during labour.

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