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Termination of Pregnancy in PROM Using Prostaglandins

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Abstract: **Premature rupture of membranes is considered one of the most important common obstetric complications as it corresponds to about 3.7-17% of pregnancies according to Wilson, as well as 5-45% according to Johnson Etal.**

Appropriate management once diagnosed is essential. Hospitalization is mandatory as PROM is one of the predisposing factors of puerperal sepsis therefore, it is considered a high risk condition, threatening the life of the mother and the fetus. Thus, pregnancy should be terminated once amniotic sepsis has developed. (Fernando)

Most obstetricians tend to just wait and monitor their patients, for at least 24 hours as spontaneous labor is expected in such period before labor induction and acceleration, according to (Ekman & William). Some conventional labor induction methods are used, like oxytocin induction, which causes hyperbilirubinemia, one of its most important complications especially in preterm infants.

While, the other problem facing oxytocin induction is the presence of unripe cervix which does not respond to oxytocin induction, causing the termination of pregnancy to fail.

Hence, it is ought to develop another method to ripen the cervix more and increase the sensitivity of the inner and outer oxytocin receptors.

Abbreviations: PROM = Premature Rupture of Membranes.

Keywords: **PROM – Pregnancy termination – Prostaglandins – Labor induction.**

1. INTRODUCTION

The management of PROM primarily aims to reduce the period of exposure to amniotic sepsis and avoid its occurrence and therefore, avoid threatening fetal and maternal complications, which lead Embry in 1988 to use one of the synthetic derivatives of prostaglandin E1, after it was confirmed to have a role in changing the nature of the connective tissue of the cervix and therefore, its ripening, in order to accelerate labor.

Prostaglandin induction of labor facilitates not only cervical ripening but also uterine muscle contraction as well as its role in the development of oxytocin receptors.

It is proved that after conservative waiting for spontaneous labor for 24 hours, the vaginal application of prostaglandin E1 (inside the cervix) followed by oxytocin labor regulation after 6 hours (in case regular labor has not developed), which has decreased the latency period from 30±7 hours to 15±3hours without the morbidity of childbirth or increasing the risk of cesarean section or amniotic sepsis development.

It was noticed that the duration required to develop labor was 15.3±8.7 hours when prostaglandin E1 was used while among the compare group members, taking placebo, it was 19±7.8 hours. However, when prostaglandin induction was followed by oxytocin induction, it was 12±7.3 hours.

Moreover, maternal septic complications were reduced when prostaglandins were used, decreasing from 20% in the compare groups to 5%....study.

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2. MATERIALS AND METHODS

First and foremost, study groups were selected according to several inclusion criteria:

Gestational age should be ≥ 34 weeks (according to the case's LMP and U/S)

Diagnosed rupture of membranes

Single pregnancy

Cephalic presentation

No history of cesarean section, placenta previa, abruption of placenta or oligohydramnios

Unripe cervix is a must with a Bishop score of ≤ 5.

After the admission of selected cases to the delivery room, a per vaginal examination under sterilized conditions was done once to evaluate cervical ripening. In addition, CTG was monitored with uterine contractions (Non stress test), continuously monitoring the mother's temperature.

CBC and CRP were continuously monitored since admission and every 12 hours to exclude the development of amniotic sepsis. In this study, amniotic sepsis was diagnosed when maternal temperature reached ≥ 38° C as well as positive CRP.

The prostaglandin used in the study is one of prostaglandin E1 analogues, Misoprostol, in the tablet form 200mcg, having a trade name of Cytotec.

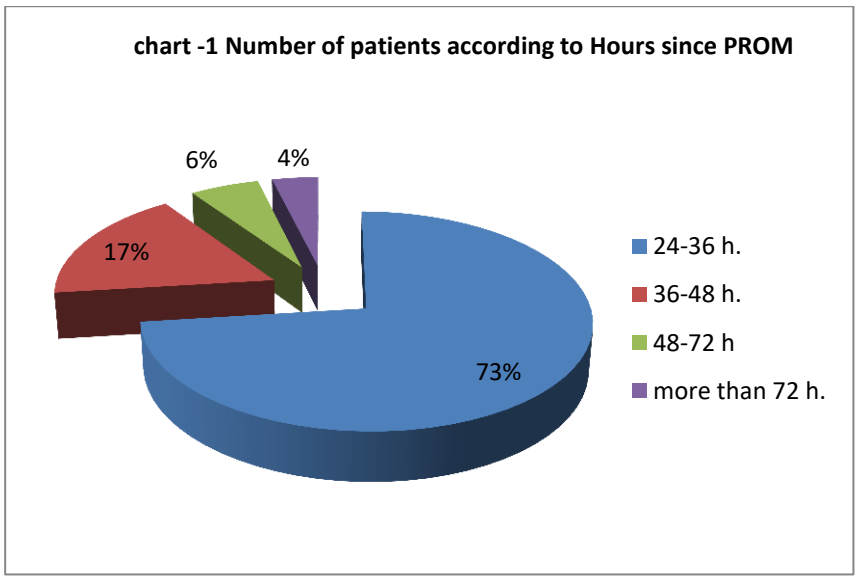
The selected cases were randomly assigned into two groups according to the route of administration of Cytotec: In the first group of cases: the Cytotec was applied deeply in the posterior fornix of the vagina with the dose of 25mcg, while in the second group, Cytotec was taken orally with the dose of 100-200mcg.

The results of the two groups were compared according to the delivery time, method of delivery, cesarean section rates, amniotic sepsis rates, the fetus's condition according to Apgar score as well as some additional complications (fetal pain - uterine hyper contractility).

3. RESULTS

The percentage of PROM in the study (which was of 20 months duration) was 11.2%. About 74.78% of the cases developed spontaneous labor in the first 24 hours, which corresponds to the international percentage in the study of Ekman.

After all the conditions have been met, the total number of the selected cases was 52 cases only, which further was divided at the time of their selection according to the number of hours since PROM, as shown in the next pie chart.



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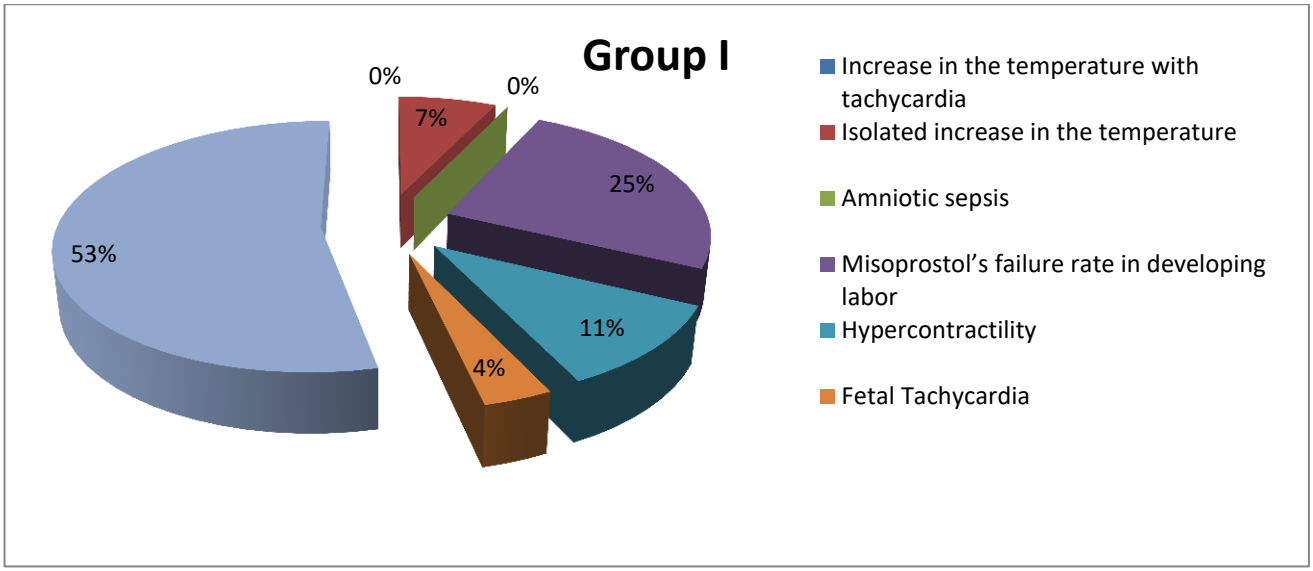
The cases were then assigned into two groups according to the route of administration of Cytotec. The first group: (25mcg-vaginal route every 4 hours if needed) 28 cases (54%). The second group: (100mcg orally every 4 hours if needed) 24 cases (46%).

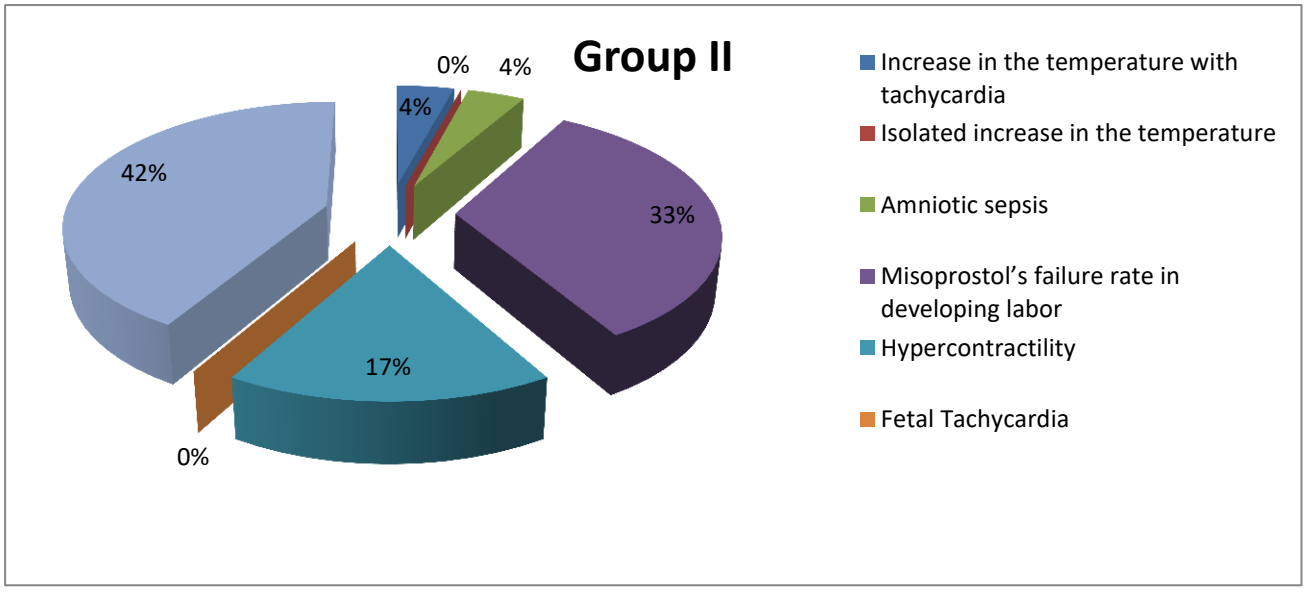
The percentage of primigravida and multipara was distributed between the two groups, as follows: The first group (primigravida 10/multipara 17) and the second group (primigravida 10/ multipara 14), which shows that the ratio in both groups (60:40) was close enough to exclude the effects the obstetric state has on the study's results.

Studying the results started with monitoring the success rate misoprostol has on normal vaginal delivery development after the ripening of cervix, developing an effective labor in pregnant females of more than 34 weeks gestational age. The percentage was 71.15% (the first group showed 75% VS 66.66% in the second group). According to the following pie charts, the number of hours of labor development was studied in each group separately.

Only 11 cases of 37 vaginal deliveries required labor regulation by oxytocin, which was estimated by 29.72%, explaining the role of prostaglandins in stimulating the smooth muscles of the fundus of uterus.

The following graph shows the distribution of some complications accompanied each groups.





On the other hand, the number of cases who required cesarean sections as a result of the failure of misoprostol to ripen the cervix and develop labor was, as follows, 7 cases in the first group and 8 cases in the second group (25% : 33.33%).

Therefore, according to the study, cesarean section rate in the second group was higher, most commonly as a result of uterine hypercontractility due to the inability to control the drug's dose.

In addition, as regards the fetal condition, Apgar score was less than 7 in only two cases in the first group, which means that the percentage among the total selected cases was 3.8% which was still higher than the international studies' rates (1.9%); however, it was still acceptable. Such percentage was due to lack of good facilities and adequate level of expertise as these two cases were delivered vaginally in a sector far from the operation and resuscitation room.

4. DISCUSSION

The number of selected cases was only 52 cases due to strict exclusion criteria. However, in the end, the cases were assigned into two groups (28:24), taking into account the almost even distribution of primigravida and multipara in the two groups.

The success rate of misoprostol to develop labor and normal vaginal delivery after ripening the cervix and the development of regular effective uterine contractions in PROM cases of ≥ 34 weeks gestational age was 21 cases in the first group, which was estimated by 75%, and 16 cases in the second group, which was estimated by 66.66%, which was totally equivalent to 71.15% in the study while in NGAI's study in 1998, it was 84%.

However, using oxytocin to regulate uterine contractions was required in only 29.72% of the selected cases. This percentage was almost equal to the one in the previously mentioned study (29.4%).

It is worth mentioning that the percentage of amniotic sepsis, uterine hypercontractility and cesarean section was more in the second group, in which oral administration of misoprostol was used. However, when the cases did not respond to misoprostol, the ratios in both groups converged.

Concerning the complications that faced the study and the success rate of the management, the results were compared with DYAR's study results in 2000, as shown in the following graph.

Table -1 The comparison between the study's results and DYAR's study results

The first group: Vaginal route "the study"	The first group: Vaginal route "DYAR"	The second group: Oral route "OUR study"	The second group: Oral route "DYAR"	
7.14%	1.90%	0%	0.90%	Apgar score less than 7
3.60%	14.20%	0%	14.70%	Fetal tachycardia
10.70%	7.80%	20.83%	10.20%	Uterine hyper-contractility
25%	21.70%	33.33%	15.10%	Cesarean section

The most characteristic feature in such comparison was the high incidence of cesarean section and uterine hypercontractilty as a result of the failure to diagnose the latter due to the lack of expertise and monitoring equipment.

As regards amniotic sepsis as one of the complications that may accompany PROM, clinical and laboratory diagnosis was confirmed in one case in the oral group, which was estimated by only 4.16%. Therefore, such percentage was close to the one in Hannah ME's study as it was 5%, as a result of the strict measures of sterilization in each step in the study.

Thus, it is proved that vaginal use of prostaglandin is safe in case sterilization conditions were met. In addition, the ability to control the drug's dose, especially when complications occur, makes the vaginal route administration safer than the oral route. Hence, prostaglandin's vaginal use is a perfect way to terminate pregnancy in unripe cervix cases.

Finally, it is vital to mention that the study's ratios converged with the international ratios in spite of the lack of such studies among Arab countries as this research study is the first one of its kind in Syrian Arab Republic.

5. CONCLUSION

The study was conducted in the gynecological and obstetric section in Al-asad University Hospital in Lattakia in Syria, starting from 1/10/2000 to the date of 1/6/2002.

It included 52 pregnant females, assigned into two groups:

1. The first group: it included 28 cases. Cytotec was administered deeply in the vaginal fornix with a dose of 25 mcg, repeated every 4 hours in case of no labor development.

2. The second group: it included 24 cases. Cytotec was administered orally with a dose of 100 mcg, repeated every 4 hours in case of no response.

And the study's results were, as follows:

Prostaglandins had a very effective role in cervical ripening and labor development. Therefore, their synthetic analogues were efficient especially in PROM cases and those who passed their 24 hours of monitoring with no spontaneous labor development.

The success rate of misoprostol to ripen the cervix and develop normal vaginal delivery in PROM cases of ≥ 34 weeks gestational age was 75% when used vaginally in the first group and 66.66% when used orally.

The percentage of amniotic sepsis was significantly low, reaching 4.16% due to strict sterilization measures.

One of the most common complications that accompanied PROM in the study was uterine hypercontractility as it was found in 20.8% of cases in the oral group because of the difficulty in controlling the dose while in the vaginal group, it was only 10.7%.

However, as regards the emergent cesarean section ratio, it was estimated by 25% in the first group and 33.33% in the second group.

Therefore, the complications that accompanied the study prove that misoprostol cannot be totally safe so strict monitoring to the mother and the fetus is mandatory when used.

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