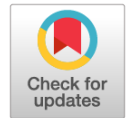


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Combined method of preparing the cervix uteri for labor in pregnant women with a lack of birth preparedness and a tendency to post-term pregnancy

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AIM: The aim of this study was to develop an effective method for preparing the cervix for labor in pregnant women with lack of birth preparedness and a tendency to post-term pregnancy, as well as for reducing the time required for the preparation in order to conduct subsequent labor stimulation.

MATERIALS AND METHODS: The patients were divided into three groups depending on the method of preparing the cervix for childbirth: in Group 1 ($n = 50$), laminaria was used only; in Group 2 ($n = 50$), a Foley catheter was used in combination with mifepristone; in Group 3 ($n = 50$), mifepristone was only used. The inclusion criteria were gestational period 41 weeks — 41 weeks and 4 days inclusive, immature cervix (a Bishop score from 0 to 2), singleton pregnancy, cephalic presentation, whole fetal bladder, vaginal cleanliness (I-II grade), satisfactory fetal condition (normal cardiotocographic curve and normal Doppler fetal hemodynamic parameters). Statistical processing of the obtained data was carried out using the STATISTICA 10.0 program.

RESULTS: Patients of the three groups were comparable in age and gestational age, and did not differ in parity and body mass index. With the combined preparation of the cervix for labor with mifepristone and a Foley catheter, the Bishop score was higher and the cervical assessment was done faster than when preparing with only laminaria or antigestagens. Combining mifepristone with a Foley catheter allowed for reducing the time interval starting from pre-induction to the development of labor in comparison with pre-induction with mifepristone alone or with the help of luminaria. This combination also reduced the frequency of caesarean section due to the lack of effect from induction of labor compared to pre-induction with mifepristone alone or with the help of luminaria. The undoubted advantages of this combined method of preparing the cervix uteri for labor are its effectiveness, a low risk of uterine hyperstimulation, fetal distress syndrome, as well as the absence of a high risk of developing infectious complications.

CONCLUSIONS: The combined method of preparing the body tending to post-term pregnancy for labor is effective and safe, while it allows for reducing the preparation time in case of a lack of birth preparedness.

Keywords: tendency to post-term pregnancy; mifepristone; luminaria; Foley catheter; preparation of the cervix for childbirth; combined method; amniotomy; lack of birth preparedness.

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Комбинированный метод подготовки шейки матки к родам у беременных с отсутствием биологической готовности организма к родам при тенденции к перенашиванию

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Цель — разработка эффективного метода подготовки мягких родовых путей к родам у беременных при тенденции к перенашиванию на фоне отсутствия биологической готовности к родам, а также сокращение времени подготовки мягких родовых путей к родам с целью проведения в последующем родовозбуждения.

Материалы и методы. Пациентки были распределены на три группы в зависимости от способа подготовки шейки матки к родам: в 1-й группе ($n = 50$) использовали только ламинарии, во 2-й группе ($n = 50$) — двухходовой катетер Фолея в сочетании с мифепристоном, в 3-й группе ($n = 50$) — только препарат мифепристон. Критерии включения: гестационный срок 41 нед. — 41 нед. и 4 дня включительно, незрелая шейка матки (исходный балл по шкале Бишопа 0–2), одноплодная беременность, головное предлежание плода, целый плодный пузырь, степень чистоты влагалища I–II, удовлетворительное состояние плода (нормальный тип кривой по кардиотокографии и отсутствие нарушений гемодинамики плода по данным доплерометрии). Статистическую обработку полученных данных проводили с помощью программы STATISTICA 10.0.

Результаты. Пациентки трех групп были сопоставимы по возрасту, сроку гестации, а также не отличались по паритету родов и по индексу массы тела. При комбинированной подготовке шейки матки к родам мифепристом и катетером Фолея динамика созревания шейки матки по шкале Бишопа более выражена и процесс происходит быстрее, чем при подготовке к родам только ламинариями или только антигестагенами. При комбинировании мифепристона и катетера Фолея удается сократить временной интервал от начала преиндукции до развития родовой деятельности по сравнению с преиндукцией родов только мифепристомом или только с помощью ламинарий, а также снизить частоту кесарева сечения в связи с отсутствием эффекта от индукции родов по сравнению с преиндукцией родов только мифепристомом или только с помощью ламинарий. Несомненным преимуществом данного комбинированного метода подготовки шейки матки к родам являются эффективность, низкий риск гиперстимуляции матки, дистресс-синдром плода, а также невысокий риск развития инфекционных осложнений.

Заключение. Комбинированный способ подготовки шейки матки к родам при тенденции к перенашиванию эффективен, безопасен и позволяет сократить время подготовки мягких родовых путей к родам на фоне отсутствия биологической готовности к родам.

Ключевые слова: тенденция к перенашиванию; мифепристон; ламинарии; катетер Фолея; подготовка шейки матки к родам; комбинированный метод; амниотомия; отсутствие биологической готовности организма к родам.

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BACKGROUND

The tendency to post-term pregnancy is one of the main indications for cervical preparation [1]. Gestational age of >41 weeks increases the risk of fetal complications, such as meconium aspiration, labor asphyxia, and shoulder dystocia. In addition, the risk of increased perinatal morbidity, mortality, and stillbirth occurs. Thus, in children born from 41 weeks and 0 days to 42 weeks and 6 days, a higher risk of neonatal mortality (odds ratio 1.34, 95% confidence interval 1.08–1.65) is encountered compared with children born before 41 weeks [2]. In the mother, the risk of obstetric injuries and vaginal operative deliveries also increases [3].

Therefore, cervical preparation in patients with a tendency for post-term pregnancy is very relevant and represents a method for complication prevention, which allows the development of regular labor without the use of uterotonic drugs or achieves optimal biological readiness for childbirth before labor induction.

Methods of cervical preparation for childbirth include mechanical and pharmacological ones. Pharmacological methods include the use of prostaglandin E₁ (misoprostol), prostaglandin E₂ (intracervical dinoprostone in a gel form), and antigestagen (mifepristone). In recent years, the administration of prostaglandin E₂ (dinoprostone) intracervically or posteriorly into the vaginal fornix was widely used [4]. The disadvantages of this method include an increased incidence of abnormalities in labor, which entails an increased frequency of labor induction and cesarean section, as well as negative fetal conditions.

Mechanical methods of expanding the cervical canal using a balloon catheter, laminaria, and/or hygroscopic dilators are widely applied. The use of Foley catheters was proven to be a simple, inexpensive, and highly effective method of labor induction. Given the evidence from 18 current systematic Cochrane reviews, the World Health Organization (2014) recommended the use of balloon catheters for childbirth preparation.

The use of Foley catheters for preinduction to childbirth has an advantage over pharmacological (prostaglandin E₂) and mechanical (laminaria) methods [5–7]. With an initial maturity of 0–1 points, the efficiency of prepidil-gel and laminaria does not exceed 20%, and that of the Foley catheter does not exceed 97%. The high efficiency of the Foley catheter was revealed, which can be used for cervical preparation for childbirth, both initially and in the absence of the effect of other labor induction methods, including in cases of the immature cervix. Research results expanded the range of mechanical methods used for cervical preparation using a Foley catheter, which is the most effective labor induction method, including at cervix maturity of 1–2 points. With a more mature cervix (3 points or more), using this method, a 100% result in labor induction can be obtained. Thus, the

analysis of using a Foley catheter as a method of cervical preparation for childbirth showed its pronounced advantage over pharmacological (prostaglandin E₂) and widespread mechanical (natural laminaria) methods. The use of a Foley catheter is not only a safe and highly effective method with the ineffective action of medications but also the method of choice, particularly for post-term pregnancy in patients with an initial degree of cervical maturity of <1 point on the Bishop scale. Compared to other methods, the greatest change in the Bishop index over time using a Foley catheter was registered with the smallest time interval. Advantages include ease of storage and inexpensiveness. The Foley catheter method has potential advantages over other methods widely used in the Russian obstetric practice. The proven efficacy, financial benefits, and apparent safety of the Foley catheter will make this method more popular, which will further expand the scope of its application [7]. The undoubted advantages of mechanical methods of cervical preparation for childbirth consist in efficiency compared to pharmacological methods, low risk of uterine hyperstimulation, fetal distress syndrome, absence of side effects, and evidence-based high risk of infectious complications [8].

Mifepristone has a high affinity for progesterone receptors, which determines the receptor mechanism of action. Mifepristone binds to the progesterone receptor, which leads to its conformational rearrangement, and further transcriptional effects become impossible. Thus, mifepristone blocks the effects of progesterone by competitive inhibition of its receptor [9]. When prescribing mifepristone for childbirth preparation, pronounced signs of cervical collagenolysis are encountered [10]. According to P.V. Stenlund et al., after using mifepristone at 200 mg once daily, spontaneous labor began within the first 48 h in 79.2% of patients and only in 16.7% of pregnant women in the control group, who received placebo [11]. The mifepristone group required lower doses of oxytocin for vaginal delivery than that of the control group [12]. Antigestagens do not negatively affect the formation of lactation and menstrual functions in women after childbirth, as well as the condition of newborns [12, 13].

However, despite the availability of effective preinduction methods, the question of the most optimal scheme is still open, since all methods have several disadvantages, and their use, unfortunately, does not always lead to the desired result. Therefore, combining the active soft birth canal preparation and various modern methods of preinduction for childbirth becomes necessary.

MATERIALS AND METHODS

In Maternity Hospital No. 9, the authors conducted a retrospective clinical study among 150 pregnant women from June 2019 to June 2020, which aimed to compare the

pharmacological and mechanical methods of preinduction of labor and their combination.

Inclusion criteria were gestational age of 41 weeks to 41 weeks and 4 days inclusive, immature cervix (baseline score on the Bishop scale 0–2), singleton pregnancy, cephalic presentation, intact fetal bladder, vaginal cleanliness I–II, and satisfactory fetal condition (normal type of curve according to cardiotocography and absence of fetal hemodynamic disorders according to dopplerometry).

Exclusion criteria were pregnant women with incomplete pregnancy, multifetal pregnancy, pelvic presentation of the fetus, a scar on the uterus, severe preeclampsia, severe extragenital pathology, planned operative delivery, and gestational period of 41 weeks 5 days or more.

All patients who met the inclusion criteria were distributed into three groups depending on the method of cervical preparation for childbirth. Only laminaria was used in group 1 ($n = 50$), a Foley catheter combined with mifepristone in group 2 ($n = 50$), and only mifepristone in group 3 ($n = 50$).

The criteria for the efficiency of preinduction methods were as follows: 1) frequency of reaching a mature cervix (7 points or more on the Bishop scale) after 24 and 48 h from the start of preinduction; 2) time to reach cervical maturity for amniotomy (7–8 points on the Bishop scale); 3) dynamics of cervical maturation (difference in points on the Bishop scale, obtained by subtracting the original from the last measurement); 4) time interval from the onset of preinduction to the development of labor; 5) frequency of spontaneous labor within 24 and 48 h; and 6) frequency of labor induction with amniotomy.

Data were statistically processed using the STATISTICA 10.0 program. The Kruskal–Wallis H-test or the post-hoc Tukey test was used to compare the studied indicators. Data were checked for normality of distribution using the Shapiro–Wilk test, and the homogeneity of variances was assessed using the Levene test. Continuous variables with normal distribution are presented as $M \pm Se$, where M is the arithmetic mean and Se is the standard error of the mean. Medians (25th–75th percentiles) were used in case of the absence of normal distribution of the sample. Correlation analysis was performed using Spearman's rank correlation assessment. The Pearson's chi-squared test (χ^2) was used to compare indicators measured in a nominal or ordinal scale. For small samples, the chi-square was calculated with Yates's correction or using Fisher's exact two-tailed test. p -values of <0.05 were considered statistically significant.

STUDY RESULTS

The female patients of the three groups were comparable in age (30.0 ± 4.8 ; 31 ± 4.4 ; and 30 ± 4.8 years, respectively), gestational age (289.5 ± 0.21 ; 289.0 ± 0.22 ;

and 289.5 ± 0.21 days, respectively), parity of childbirth (74%, 76%, and 74% of primiparous, respectively), and body mass index (27 ± 0.3 ; 27 ± 0.27 ; and 27 ± 0.32 kg/m², respectively) ($p > 0.5$). The patients of all groups did not significantly differ according to the gynecological history (induced abortions, spontaneous miscarriages, gynecological surgeries, and infertility in the anamnesis). During pregnancy, no statistically significant differences were found in the three groups among the number of women with threatened preterm birth, early toxicosis, polyhydramnios, oligohydramnios, moderate preeclampsia, pregnancy anemia, chronic placental insufficiency, gestational pyelonephritis, or chronic urogenital infection. However, in group 2, where mifepristone and the Foley catheter were used, the number of women who were hospitalized for the antenatal period was significantly less (40%) than in group 1 (64%) ($p < 0.05$) and group 3 (68%) ($p < 0.05$) (Table 1).

No statistical differences were found in the baseline score since one of the inclusion criteria in the three groups was an immature cervix (assessment of the cervix on the Bishop scale of 0–2 points). The initial degree of maturity of the cervix according to the Bishop scale was 1.0 ± 0.08 points in the group 1, 1.0 ± 0.08 points in the group 2, and 1.0 ± 0.09 points in the group 3 ($p > 0.5$).

The study groups noted significant differences in cervical assessment using the Bishop scale 24 h after the onset of preinduction ($p < 0.0001$). The highest score on the Bishop scale 24 h after the onset of preinduction was noted in group 2 (8.0 ± 0.04 points [8.0–8.0]) and the lowest was noted in group 1 (7 ± 0.04 points [7.0–7.5]) ($p < 0.0001$ for groups 2–1 and 2–3). According to the dynamics of cervical maturation following the Bishop scale, the highest increase in points was registered in the group 2 (7.0 ± 0.09 points [6.0–7.0]) ($p < 0.001$), lower in the group 3 (6.0 ± 0.13 points [6.0–7.0]) ($p < 0.001$), and lowest in the group 1 (6.0 ± 0.09 points [5.0–6.0]) ($p < 0.001$) (Table 1). The greatest efficiency of cervical preparation for childbirth was noted in group 2 (combination of mifepristone and Foley catheter). At a control cervical examination 24 h after the onset of preinduction, a mature cervix (7–8 points on the Bishop scale) was registered in 90% of women ($p < 0.01$) who received combined preparation for childbirth with mifepristone and a Foley catheter, which was significantly different from this indicator in the groups with mifepristone (62%) ($p < 0.01$) and laminaria (48%) ($p < 0.01$) (Table 1, Fig. 1).

One of the parameters for assessing the efficiency of preinduction schemes for labor was the proportion of patients who started labor in the time interval of the first 24 and 48 h from the onset of preinduction. The total proportion of all female patients who independently started labor in the first 48 h did not statistically differ, regardless of the preinduction method (84%, 90%, and 88%) ($p > 0.05$). In the group with a Foley catheter and mifepristone, 90% of

Table 1. Characteristics of patients in the study groups

| Parameter | Group 1 (n = 50), laminaria | Group 2 (n = 50), mifepristone and Foley catheter | Group 3 (n = 50), mifepristone | Statistical significance, p |
|--|-----------------------------|---|--------------------------------|---|
| Proportion of primiparous | 74% (37) | 76% (38) | 74% (37) | >0.05 |
| Body mass index, kg/m ² | 27 ± 0.3 | 27 ± 0.27 | 27 ± 0.32 | >0.05 |
| Age, years | 30 ± 4.84 | 31 ± 4.42 | 30 ± 4.8 | >0.05 |
| Gestational age at the start of preinduction, days | 289.5 ± 0.21 | 289.0 ± 0.22 | 289.5 ± 0.21 | >0.05 |
| History of abortion | 18% (9) | 10% (5) | 12% (6) | >0.05 |
| History of miscarriages | 12% (6) | 8% (4) | 22% (11) | >0.05 |
| History of infertility | 2% (1) | 6% (3) | 0% | >0.05 |
| History of gynecological surgery | 14% (7) | 14% (7) | 12% (6) | >0.05 |
| Threatened miscarriage | 16% (8) | 16% (8) | 18% (9) | >0.05 |
| Early gestational toxicosis | 0% | 2% (1) | 2% (1) | >0.05 |
| Hydramnios | 8% (4) | 4% (2) | 10% (5) | >0.05 |
| Oligoamnios | 4% (2) | 10% (5) | 8% (4) | >0.05 |
| Antenatal hospitalization | 64% (32) | 40% (20) | 68% (34) | <0.05 2-3* <0.05 2-1 |
| Moderate preeclampsia | 6% (3) | 0% | 10% (5) | >0.05 |
| Anemia of pregnancy | 10% (5) | 8% (4) | 18% (9) | >0.05 |
| Placental insufficiency | 0% | 4% (2) | 0% | >0.05 |
| Chronic urogenital infections | 2% (1) | 2% (1) | 2% (1) | >0.05 |
| Initial Bishop index, points | 1.0 ± 0.08 | 1.0 ± 0.08 | 1.0 ± 0.09 | >0.05 |
| Control Bishop index 24 h after the start of preinduction, points | 7.0 ± 0.04 | 8.0 ± 0.04 | 8.0 ± 0.07 | <0.0001 1-2 <0.0001 1-3 <0.0001 2-3 |
| Changes over time of the Bishop index 24 h after the start of preinduction, points | 6 ± 0.09 | 7 ± 0.09 | 6 ± 0.13 | <0.001 1-2 <0.001 1-3 |
| Incidence of a mature cervix 24 h after the start of preinduction | 48% (24) | 90% (45) | 62% (31) | <0.001 2-1 <0.001 2-3 |

*groups.

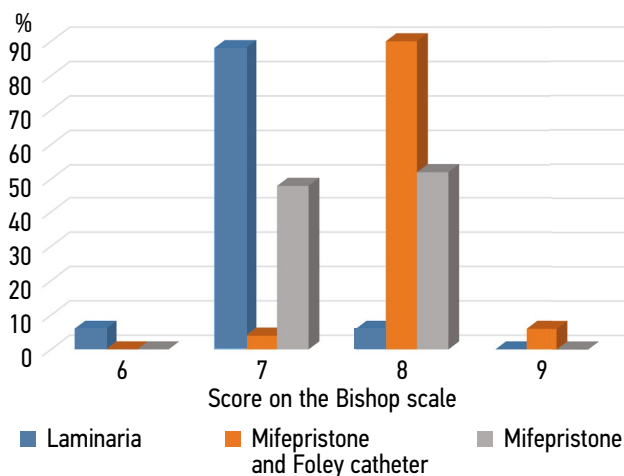


Fig. 1. Bishop index 24 h after the start of preinduction

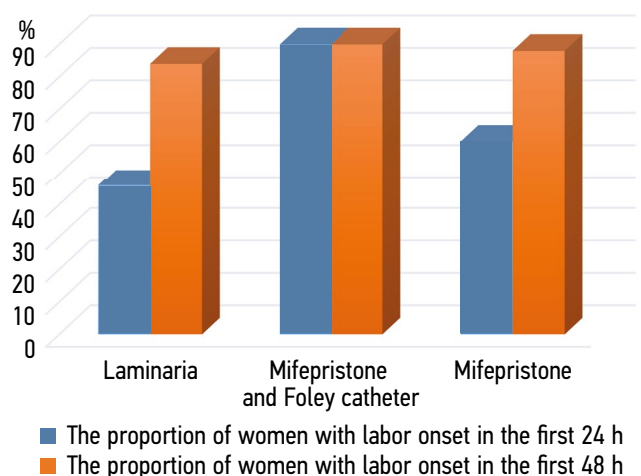


Fig. 2. Distribution of women in groups who independently started childbirth within the first 24 and 48 h from the start of induction

Table 2. Comparison of the effectiveness of preinduction of the studied body preparation methods for childbirth

| Parameter | Group 1 (n = 50), laminaria | Group 2 (n = 50), mifepristone and Foley catheter | Group 3 (n = 50), mifepristone | Statistical significance, p |
|---|--------------------------------|---|-----------------------------------|--------------------------------|
| Time interval from the onset of preinduction to the development of labor, min | 1740 ± 20.0 | 795 ± 16.7 | 1560 ± 27.2 | <0.0001 2–3* <0.005 1–2 |
| Frequency of labor induction | 38% (19) | 14% (7) | 30% (15) | <0.05 1–2 |
| Cesarean section frequency | 32% (16) | 18% (9) | 26% (13) | <0.05 2–1 <0.05 2–3 |
| Frequency of elective cesarean section due to the lack of the body biological readiness for childbirth, % | 10 | 4 | 6 | >0.05 |
| Lack of development of labor, % | 46 | 90 | 60 | <0.01 2–1 <0.01 2–3 |
| Rupture to delivery interval, min | 485 ± 39.17 | 540 ± 38.91 | 427.5 ± 35.3 | >0.05 |
| Duration of labor, min | 417.5 ± 31.2 | 417.5 ± 27.69 | 435.0 ± 32.3 | >0.05 |
| Duration of the preliminary period, min | 480.0 ± 19.04 | 300.0 ± 14.32 | 480.0 ± 93.8 | <0.0001 1–2 <0.05 2–3 |
| Pain relief during labor | 20% (10) | 6% (3) | 30% (15) | >0.05 2–1 >0.05 2–3 |
| Poor uterine contraction strength | 4% (2) | 4% (2) | 2% (1) | >0.05 |
| Discoordinated labor contractions | 16% (8) | 6% (3) | 14% (7) | <0.05 |
| Metripercinesia | 0% | 4% (2) | 2% (1) | >0.05 |
| Chorioamnionitis | 10% (5) | 8% (4) | 8% (4) | >0.05 |
| Vacuum-assisted delivery | 4% (2) | 2% (1) | 0% | >0.05 |
| Manual examination of the uterine cavity | 4% (2) | 0% | 6% (3) | <0.05 |
| Rupture of the vaginal mucosa | 20% (10) | 20% (10) | 2% (1) | <0.05 1–3 <0.05 2–3 |
| Hysteroecorrhesis degree I | 6% (3) | 8% (4) | 6% (3) | >0.05 |
| Hysteroecorrhesis degree II | 4% (2) | 2% (1) | 2% (10) | >0.05 |

* groups.

pregnant women started labor in the first 24 h (all patients with a mature cervix) ($p < 0.01$), which was the highest rate among the studied groups (46% in the group 1 [$p < 0.01$], and 60% in the group 3 [$p < 0.01$]) (Fig. 2).

The frequency of labor induction with amniotomy was highest in group 1 (laminaria), amounting to 38%, which was almost 2.5 times higher than in the group with a combination of mifepristone and Foley catheter (14%) ($p < 0.05$). This can probably be due to the significantly higher number of women whose labor activity spontaneously developed due to preinduction in the group with the combined method of cervical preparation for childbirth (Table 2).

The time interval required for the development of labor was significantly shorter in the group with the Foley catheter and mifepristone (795 min [720.0–900.0]) compared with the groups with only laminaria (1740.0 min [1620.0–1830.0]) ($p < 0.005$) and only mifepristone (1560.0 min [1470.0–1650.0]) ($p < 0.0001$). This indicates the efficiency of this combined method for childbirth preparation,

which is manifested in a decreased period of preinduction of labor (Table 2).

The duration of labor in the groups did not differ and lasted for 417.5 ± 31.2, 435.0 ± 32.35, and 417.5 ± 27.69 min, respectively ($p > 0.05$), as well as that of the rupture to the delivery interval which was 485.0 ± 39.17, 540.5 ± 38.91, and 427.5 ± 35.33 min, respectively ($p > 0.05$). However, the shortest duration of the preliminary period was recorded in patients in the group with combined preparation for childbirth with mifepristone and a Foley catheter. It was 300 ± 14.32 min (300–360.0), which was significantly less compared to the groups using laminaria (480 ± 19.04 min [360.0–600.0]) ($p < 0.001$) and mifepristone (480.0 ± 19.8 min [300.0–600.0]) ($p < 0.005$) (Table 2).

The absence of the preinduction effect of labor was noted in 3 (6%) patients in group 2, where the Foley catheter and mifepristone were used, which was significantly less frequent than in group 1, where laminaria were used ($p < 0.05$), and in the group 3 using mifepristone ($p < 0.05$)

Table 3. Characteristics of the condition of newborns

| Parameter | Group 1 (n = 50), laminaria | Group 2 (n = 50), mifepristone and Foley catheter | Group 3 (n = 50), mifepristone | Statistical significance, <i>p</i> |
|---|--------------------------------|---|-----------------------------------|---------------------------------------|
| Apgar at the minute 1, points | 8.0 ± 0.67 | 8.0 ± 0.16 | 8.0 ± 0.06 | >0.05 |
| Apgar at the minute 2, points | 9.0 ± 0.06 | 9.0 ± 0.15 | 9.0 ± 0.59 | >0.05 |
| Newborn weight, g | 3625.0 ± 62.31 | 3545.0 ± 57.53 | 3600.0 ± 52.08 | >0.05 |
| The proportion of newborns latched on immediately after birth, % | 80% (40) | 96% (48) | 92% (46) | <0.05 2-1* |
| The proportion of newborns with cephalohematoma | 2% (1) | 0 % | 2% (1) | >0.05 |
| Neonatal jaundice, % | 48% (24) | 50 % (25) | 18% (9) | <0.05 3-1 <0.05 3-2 |
| Antibiotic therapy in newborns | 18% (9) | 4% (2) | 2% (1) | <0.05 1-3 <0.05 2-1 |

* groups.

(8 [16%]; 7 [14%] pregnant women, respectively). In group 1 (laminaria), 32% of patients delivered by cesarean section, which was significantly higher than the proportion of patients who delivered by cesarean section in groups 2, with the combined method of preparation for childbirth ($p < 0.05$) and 3 using mifepristone ($p < 0.05$) (18% and 26%, respectively); 2 patients (4%) in group 2 (a combination of Foley catheter and mifepristone) delivered in a planned manner due insufficient biological readiness of the birth canal, which did not statistically differ from groups 1 and 3 (10% and 6%, respectively) ($p > 0.05$) (Table 2). The study groups did not statistically differ in the number of labor abnormalities, chorioamnionitis (Table 2), newborn weights, and the state of newborns on the Apgar scale (Table 3). No Apgar score was <7 points in the 5 min of life. In the group 2 (combination of mifepristone and Foley catheter), pain relief during labor was significantly used less frequently (6%) than in groups 1 (20%) ($p < 0.05$) and 3 (30%) ($p < 0.05$). Ruptured vaginal mucosa in the group 3 (mifepristone) was significantly less frequent (2%) than in groups 1 (20%) ($p < 0.05$) and 2 (20%) ($p < 0.05$) (Table 2). The number of children receiving antibiotic therapy in group 1 (laminaria) was greater than that in groups 2 ($p < 0.05$) and 3 ($p < 0.05$). In group 1 (laminaria), significantly fewer children were immediately latched on after delivery than that in group 2 (mifepristone and Foley catheter) ($p < 0.05$). Neonatal jaundice in the group 3 was registered less frequently than in groups 1 ($p < 0.05$) and 2 ($p < 0.05$) (Table 3).

The correlation analysis result revealed the following relationships in the studied groups. Thus, when using the combined method of childbirth preparation with mifepristone and a Foley catheter, a direct correlation is determined between the gestational age and the time interval from the onset of preinduction to the development of labor. The longer the gestation period is, the longer it takes from the onset of preinduction to develop labor ($r = 0.31$) due to

the increased disorders in neurohumoral processes with increased gestational age (>40 weeks), leading to a post-term pregnancy. An inverse correlation was also established between the gestational age and the duration of labor and the rupture to delivery interval, as the longer the gestation period is, the shorter is the total duration of labor ($r = -0.38$), particularly in stage 1 of labor ($r = -0.39$) and the rupture to delivery interval ($r = -0.34$). This can be due to the high frequency of a positive response to the preparation of the body for childbirth using this method, namely the high rate of achieving spontaneous development of labor in the study group.

The case of mifepristone determined an inverse correlation between the duration of the rupture to delivery interval and the time interval from the onset of preinduction to the development of labor, which was $r = -0.42$, which probably confirms the feasibility of amniotomy for labor induction in patients with a mature cervix according to the Bishop scale for accelerating labor development.

In three groups, a direct correlation was established between the dynamics of the number of points on the Bishop scale and the assessment on the Bishop scale 24 h after the onset of preinduction ($r = 0.41$ in group 1, $r = 0.55$ in group 2, and $r = 0.35$ in group 3), as well as an inverse correlation between the initial cervical assessment on the Bishop scale and the change in the number of points on the Bishop scale ($r = -1.0$; $r = 0.85$; and $r = -0.89$, respectively). Thus, the change of the cervical assessment on the Bishop scale, as well as the time interval from the onset of preinduction to the development of labor, depended on the method of childbirth preparation, whereas in the combined cervical preparation for childbirth using mifepristone and a Foley catheter, the dynamics of the cervical condition on the Bishop scale was more pronounced and the process was faster than in childbirth preparation with only laminaria or only antigestagens.

CONCLUSIONS

The combination of mifepristone and Foley catheter shortened the time interval from the onset of preinduction to the development of labor and reduced the frequency of cesarean section due to insufficient effects from preinduction of labor than that with mifepristone alone or only with laminaria. The undoubted advantage of this combined

method of cervical preparation for childbirth is its efficiency and low risk of uterine hyperstimulation and fetal distress syndrome, as well as a low risk of infectious complications.

Thus, the combined preparation method for childbirth with a tendency to post-term pregnancy is effective and safe and reduces the preparation time to soften the birth canal for childbirth in case of insufficient birth preparations with a tendency to post-term pregnancy.

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