

Abstract

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CONDITION OF THE UTERINE CERVIX DURING
UNCOMPLICATED MULTIPLE PREGNANCY

Premature birth is an actual problem of modern obstetrics. There is a lot of different reasons for preterm delivery. It includes maternal and fetal complications and forms one major obstetric syndrome. One of the anatomical components of it is the cervix. Objective of the study was to examine the state of the cervix during a normal multiple pregnancy. In addition, our task was to find a progressive decrease in the length of the cervix with increasing gestational age. Starting from 22-24 weeks, the rate of cervical shortening in pregnancy with twins is much higher than those in singleton pregnancies. However, the most pronounced difference in the length of the cervix in multiple pregnancies and single pregnancies was observed in the third trimester of pregnancy. Previous studies have indicated that at the time of birth, the length of the cervix in patients with multiple fetuses was significantly shorter than in singleton pregnancies. In most patients, the internal os was Y-shaped.

The study was carried out in the city clinical maternity hospital during 2013–2017. The data were collected from 20 pregnant women (group I) with dichorial twins, who had pregnancy without complications and ended in term delivery. In the second group we united 20 pregnant women with a singleton pregnancy without any complications. The data were collected from using clinical examination methods, generally accepted laboratory tests. Transvaginal cervicometry was performed to understand the threat of preterm delivery. We used a modern ultrasound device “Mylab Seven” with a 6.5 MHz.

The study showed that for multiple pregnancies, as well as for singleton pregnancies, patients who have given birth on time are characterized by a progressive decrease in the length of the cervix as the duration of pregnancy increases. Based on the finding, starting from 22–24 weeks of gestation, the rate of cervical shortening is significantly higher than that in singleton pregnancies. The study proved that the most pronounced difference in the length of the cervix in multiple pregnancies and single pregnancies is observed in the third trimester of pregnancy.

Keywords: multiple pregnancy, cervix, cervical canal.

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Резюме

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СТАН ШИЙКИ МАТКИ ПРИ НЕУСКЛАДНЕНІЙ БАГАТОПЛІДНІЙ ВАГІТНОСТІ

Метою роботи було вивчення стану шийки матки при багатоплідній вагітності, що проходила нормально.

Дослідження проводилося на базі міського клінічного пологового будинку упродовж 2013–2018 років. Під наглядом перебувало 20 вагітних (I група) з дихоріальними двійнями, у яких вагітність проходила без ускладнень і закінчилася терміновими пологамі. До II групи увійшли 20 вагітних із одноплідною вагітністю, у яких також вагітність проходила без ускладнень. Вивчено загальний, соматичний, акушерсько-гінекологічний анамнез, особливості перебігу вагітності, пологів, стан шийки матки шляхом вагінального дослідження. Окрім клінічних методів обстеження та загальноприйнятих лабораторних досліджень, з метою оцінки загрози передчасного переривання вагітності проводилася трансвагінальна цервікометрія. Вивчено стан шийки матки при неускладненому перебігу багатоплідної вагітності. Дослідження показало прогресивне зменшення довжини шийки матки по мірі збільшення гестаційного терміну. Починаючи з 22–24 тижнів темпи вкорочення шийки матки при вагітності двійнею значно перевищували такі при одноплідній вагітності. Так, у терміні вагітності 25–27 тижнів довжина шийки матки при багатоплідності становила $33,2 \pm 3,7$ мм проти $35,6 \pm 3,3$ мм при одноплідній вагітності ($p > 0,05$). При індивідуальному аналізі звертала на себе увагу значна варіабельність досліджуваного показника у пацієнок із багатоплідністю: від 10,9 мм до 47,6 мм. Найбільш значна різниця у довжині шийки матки при багатоплідній і одноплідній вагітності відзначалася у третьому триместрі вагітності. У терміні пологів довжина шийки матки у пацієнок із багатопліддям була значно коротшою, ніж при одноплідній вагітності. У більшості пацієнок внутрішній зів мав Y-подібну форму. Виявлені зміни шийки матки можуть бути пов'язані зі зміною гормонального фону впродовж періоду гестації, витончення міометрію із зростанням терміну вагітності. Отримані результати можуть бути застосовані в практичній діяльності лікарів ультразвукової діагностики. Перспективи подальших досліджень пов'язані з вивченням стану шийки матки при загодзі переривання вагітності, оцінкою ефективності використання медикаментозних засобів і акушерського песарію.

Ключові слова: багатоплідна вагітність, шийка матки, цервікальний канал.

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Introduction

Premature birth is one of the most important problems of modern obstetrics. The etiology of preterm birth is multifactorial and includes both maternal and fetal complications against the background of the action of functionally weakened variants of many genes thus preterm labor is considered as a major obstetric syndrome. One of the anatomical components of this syndrome is the cervix. Of-

ten, in singleton pregnancy, the only reliable prognostic marker of threatening preterm labor is untimely maturation of the cervix against the background of uterine activity [1, 2, 5]. At the same time, there are few publications on the subject of the state of the cervix uterine pregnancy with normal pregnancy and the threat of abortion during various periods of gestation [3, 7].

In obstetric practice, the state of the cervix is assessed by vaginal examination, ultrasound screening [4, 6]. In addition, transvaginal ultrasonic cervicometry, which is the “gold standard” for measuring the cervix, is widespread [8]. It allows you to more accurately visualize the area of the internal and external os, measure the length of the cervix, determine the shape and degree of expansion of the internal os and the cervical canal and help to avoid many transabdominal measurement errors.

Objective: to study the state of the cervix during a normal multiple pregnancy.

Materials and research methods

The study was conducted on the basis of the city clinical maternity hospital during 2013–2017. Under observation there were 20 pregnant women (group I) with dichorial twins, who had pregnancy without complications and ended in term delivery. Group II included 20 pregnant women with a singleton pregnancy, which also had a pregnancy without complications. The general, somatic, obstetric-gynecological history, the features of the course of pregnancy, childbirth, and the condition of the uterine cervix by vaginal examination were studied. In addition to clinical examination methods and generally accepted laboratory tests, transvaginal cervicometry was performed to assess the threat of premature termination of pregnancy. For this, a modern ultrasound device “MyLab Seven” with a

6.5 MHz transvaginal transducer was used. An ultrasound study paid attention to the number and position of the fetuses, the type of placentation in pregnant women. The length of the cervix was determined, the presence of T-, Y-, V-, U-shaped changes in the internal os was detected. The studies were conducted for the first time in terms of 11–13 weeks of pregnancy, and then, when prescribing correction, at least 1 time in 3 weeks.

Mathematical processing of indicators was carried out using the methods of variation statistics for comparing the two sets of average values using the Student’s criterion t of the variation statistics.

Research results and discussion

The average age of the examined I groups was 27.0 ± 4.3 years. 6 (30.0 %) women had their first pregnancy, and the other had a second one. Previous pregnancies ended in term childbirth. Cases of spontaneous or artificial abortion were not. Operations on the cervix in the gynecological history are absent. All women with uncomplicated pregnancy were observed in the women consultation.

The average age of the surveyed group II was 25.0 ± 3.3 years. 7 (35.0 %) women had their first pregnancy, and the other had a second one. Previous pregnancies ended in secondary term deliveries. Cases of spontaneous or artificial abortion were not. Women during pregnancy were observed on an ambulant basis.



Picture 1 – Opening of the internal os (Y-shaped) in a patient with twins, 24–25 weeks of gestation

Studies have shown that for multiple, as well as for singleton pregnancies, patients who have given birth on time are characterized by a progressive decrease in the length of the cervix as the duration of pregnancy increases.

The initial length of the cervix with multiple fetuses was slightly higher. But up to 22–24 weeks, the absolute values of the length of the cervix in multiple pregnancies and single pregnancies in patients who gave birth in time did not differ significantly ($p_{1-2} > 0.05$).

So, in the first half of pregnancy, the length of the cervix during a multiple pregnancy was 43.2 ± 3.9 mm, 42.2 ± 3.8 mm, 38.2 ± 4.0 mm versus 40.1 ± 3.8 mm, 39.1 ± 3.6 mm and 37.2 ± 3.0 mm for single-pregnancy, respectively, at gestational periods up to 15 weeks, at 16–18 weeks and at 19–21 weeks.

But already by 22–24 weeks, with multiple fetuses, lower cervical length was noted than with single-pregnancy: 37.7 ± 4.1 mm versus $38.2 \pm$

3.8 mm. Studies allow us to conclude that from this time onwards, the rate of shortening of the cervix during pregnancy with twins is much higher than during singleton pregnancy. Thus, at 25–27 weeks, the length of the cervix with multiple babies was 33.2 ± 3.7 mm against 35.6 ± 3.3 mm in single-pregnancy ($p_{1-2} > 0.05$). In an individual analysis, the pronounced variability of the studied parameter in patients with multiple fetuses: from 10.9 mm to 47.6 mm attracted attention.



Picture 2 – The deepening and widening of the internal OS of the cervix in multiple pregnancy

The most pronounced difference in the length of the cervix in multiple pregnancies and single pregnancies was observed in the 3rd trimester of pregnancy. So with multiple fetuses, at 28–30 weeks the length of the cervix was 30.2 ± 3.9 mm, at 31–33 weeks – 27.8 ± 4.1 mm, at 34–36 weeks – $21.1 \pm$

3.1 mm ($p_{1-3} > 0.05$). In singleton pregnancy, these figures were respectively: 35.4 ± 3.7 mm, 34.7 ± 3.8 mm, 34.5 ± 4.1 mm ($p_{1-3} > 0.05$). By the time of birth, the length of the cervix in patients with multiple fetuses was 20.7 ± 3.9 mm versus 31.6 ± 3.9 mm in single-pregnancy ($p_{1-2} > 0.05$).

Table 1 – The length of the cervix by ultrasound (M ± m)

Term of the pregnancy	Till 15 weeks	16–18 weeks	19–21 weeks	22–24 weeks	25–27 weeks	28–29 weeks	31–33 weeks	34–36 weeks
1 group	$43,2 \pm 3,9$ mm	$41,2 \pm 3,8$ mm	$38,2 \pm 4,0$ mm	$37,7 \pm 4,1$ mm	$33,2 \pm 3,7$ mm	$30,2 \pm 3,9$ mm	$27,8 \pm 4,1$ mm	$21,1 \pm 3,1$ mm
2 group	$40,1 \pm 3,8$ mm	$39,1 \pm 3,6$ mm	$37,2 \pm 3,0$ mm	$38,2 \pm 3,8$ mm	$35,6 \pm 3,3$ mm	$35,4 \pm 3,7$ mm	$34,7 \pm 3,8$ mm	$34,5 \pm 4,1$ mm
	$p_{1-2} > 0,05$	$p_{1-2} > 0,05$	$p_{1-2} > 0,05$	$p_{1-2} > 0,05$	$p_{1-2} > 0,05$	$p_{1-2} > 0,05$	$p_{1-2} > 0,05$	$p_{1-2} > 0,05$

Such differences in the length of the cervix in multiple pregnancies and single pregnancies are explained by different rates of shortening. Already from the beginning of the second trimester of multiple pregnancy, the rate of cervical shortening was significantly higher than that of single-pregnancy.

As with singleton pregnancies, there were no significant differences in the length of the cervix depending on parity.

In assessing the state of the internal os, it was noted that almost half of (47.0 %) patients with multiple fetuses who gave birth in time, the opening

of the internal os of various degrees of severity was noted already at 23–27 weeks of pregnancy

From the beginning of the third trimester of multiple pregnancies, the rate of cervical shortening was significantly higher than in the comparison group. This phenomenon was observed in 80.0 % of pregnant women of group I. It should be emphasized that the strict dependence of the degree of dilatation of the internal os of the cervix on the gestational period is not revealed. In most patients, the internal os was Y-shaped.

When initially not significantly different indicators of the length of the cervix ($p_{1-2} > 0.05$) up to 15

weeks of pregnancy (43.2 ± 3.9 mm in multiple pregnancies; 40.1 ± 3.8 mm in single-pregnancy), its length significantly decreased in patients with multiple pregnancy ($p_{1-2} < 0.001$) and amounted to 21.1 ± 3.1 mm by the time of birth. At the same time, when single-pregnancy, it slightly changed ($p_{1-2} > 0.05$) and amounted to 34.5 ± 4.1 mm.

The detected decrease in the length of the cervix, changes in the internal os can be associated with changes in hormonal levels during the period of gestation, thinning of the myometrium with an increase in gestational age.

Conclusions

1. In pregnant women with uncomplicated multiple pregnancy, there is a gradual decrease in the length of the cervix as the gestation period increases.

2. Starting from 22–24 weeks of gestation, the rate of cervical shortening is significantly higher than that in singleton pregnancies.

3. The most pronounced difference in the length of the cervix in multiple pregnancies and single pregnancies is observed in the third trimester of pregnancy.

4. At the end of dichorial diamnionic pregnancy, the internal os of the cervix becomes predominantly Y-shaped.

Prospects for further research

Prospects for further research related to the study of the state of the cervix with the threat of

abortion, evaluation of the effectiveness of the use of drugs and obstetric pessary.

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