



Is the rate of progress the same for induced and spontaneous labors?

No. This retrospective cohort study found a significantly longer latent phase when labor was induced, compared with spontaneous labor.

Harper LM, Caughey AB, Odibo AO, Roehl KA, Zhao Q, Cahill AG. Normal progress of induced labor. Obstet Gynecol. 2012;119(6):1113-1118.

► EXPERT COMMENTARY

William F. Rayburn, MD, MBA, Chair, Department of Obstetrics and Gynecology, and Director, Maternal-Fetal Medicine Fellowship Program, University of New Mexico School of Medicine, Albuquerque.

Induction of labor is warranted when the benefits of delivery (for the mother or fetus) outweigh the advantages of continuing the pregnancy. Common indications include membrane rupture, gestational hypertension, nonreassuring fetal status, and various maternal medical or fetal conditions.

Induction involves the stimulation of contractions in the absence of spontaneous labor (with or without ruptured membranes), whereas augmentation refers to stimulation of preexisting spontaneous contractions that are considered inadequate because of failed or inadequate cervical dilation and fetal descent.

Women who undergo induction of labor—particularly if nulliparous—are more likely to require cesarean delivery than those who enter labor spontaneously. As the authors of this study point out, it is unclear why induction of labor is associated with an increased risk of cesarean delivery, but it may be related, in part, to the way induced labors are managed.

The incidence of labor induction in the United States more than doubled over the past 20 years. In 2007, more than 20% of all

labors were induced in the United States.¹ When augmented labors are added to the equation, the sum likely represents half of all pregnancies, so this subject is important to us all.

Details of the study

Enter Harper and colleagues, who focused on women who **1)** carried a singleton pregnancy in vertex presentation, **2)** reached 10 cm of dilation, and **3)** had an umbilical cord gas obtained at delivery. The women were admitted for labor from July 2004 to June 2008 at Washington University Medical Center in St. Louis, Missouri. They had a minimum gestational age of 37 weeks and reached the second stage of labor. Labor and delivery records



Among nulliparous women, the median (95th percentile) time to progress from 4 cm to 10 cm was 5.5 (16.8) hours when labor was induced versus 3.8 (11.8) hours for spontaneous labors

WHAT THIS EVIDENCE MEANS FOR PRACTICE

Harper and colleagues confirm a commonly held perception that women undergoing induction of labor spend a longer total time in labor than women who enter labor spontaneously.^{3,4} Before 6 cm, women undergoing induction of labor may take as long as 10 hours to achieve each centimeter of dilation. This pattern suggests that a diagnosis of arrest of labor before 6 cm of dilation needs to be scrutinized carefully to prevent unnecessary cesarean delivery.

»» **WILLIAM F. RAYBURN, MD, MBA**



included information on medications, type of labor, times of cervical examination, extent of cervical dilation, station, duration and curves of the first stage of labor, length of the stages of labor, mode of delivery, and postpartum status.

Of 5,388 women in the cohort, 2,021 entered labor spontaneously, 1,720 had labor augmented, and 1,647 had labor induced. After adjustments for race, obesity, macrosomia, and Bishop score, women who underwent induction of labor spent a significantly longer total time in labor than did women who entered labor spontaneously.

Among nulliparous women, the median (95th percentile) time to progress from 4 cm to 10 cm was 5.5 (16.8) hours when labor was induced versus 3.8 (11.8) hours for spontaneous labors. Among multiparous women, the figures were 4.4 (16.2) hours and 2.4 (8.8) hours, respectively.

The time it took for dilation to increase 1 cm in latent labor (<6 cm dilation) was significantly longer in induced labors, compared with spontaneous labors. However, the time it took for dilation to increase 1 cm in active labor (≥ 6 cm dilation) was similar between groups.

Strengths and weaknesses of the trial

Induced labor in this cohort was significantly slower than currently accepted definitions of protraction (dilation <1 cm/hr for 4 hr) and arrest disorders (no cervical dilation for 2 hr). And the active phase of labor (defined as an increased rate of cervical dilation) began at 6 cm in this study, much later than previously accepted definitions of 3 to 4 cm.² If the traditional definitions of active-phase arrest are applied to women whose labors are induced, a significant number of cesarean deliveries may be performed prematurely for arrest disorders.


A strength of this investigation is the large size of the cohort. Patient-level data, including patient characteristics and medication details, enabled the investigators to reconstruct labor curves while adjusting for relevant confounding variables. Methods of

cervical ripening (prostaglandins, Foley balloon) were documented, as were indications for induction, making this study generalizable to a wide population.

Harper and colleagues did not stratify their findings by favorability of the cervix at the time of induction. Women who required cervical ripening had a slower labor than did women in spontaneous labor until they reached 6 cm, at which point labor patterns converged. Of interest, women who had a favorable cervix at the time of induction had a faster labor than did women in spontaneous labor, largely as a result of shorter times to reach 6 cm.

As for the women who underwent labor *augmentation*, the progress of labor before 6 cm was very similar to progress among those whose labor was induced. This finding may reflect misclassification of women between the induction and augmentation groups, or misdiagnosis of labor at the time of admission.

Women were excluded from this study if they did not reach the second stage of labor, because investigators were interested in examining the normal course of labor rather than the need for cesarean delivery. However, this exclusion could have caused selection bias.

Analysis did not begin until women reached 3 cm of dilation, largely because women in spontaneous labor were typically admitted when their cervix had dilated at least 3 cm. The period before 3 cm of dilation seems to be longest when induction of labor occurs in the presence of an unfavorable cervix. 

References

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4. Cheng YW, Delaney SS, Hopkins LM, Caughey AB. The association between the length of first stage of labor, mode of delivery, and perinatal outcomes in women undergoing induction of labor. *Am J Obstet Gynecol.* 2009;201(5):477.e1-e7.

FAST TRACK

Among multiparous women, the median (95th percentile) time to progress from 4 cm to 10 cm was 4.4 (16.2) hours in induced labors and 2.4 (8.8) in spontaneous labors