Q/ Does amniotomy shorten spontaneous labor or improve outcomes?

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EVIDENCE-BASED ANSWER

A/ **No**. Amniotomy neither shortens spontaneous labor nor improves any of the following outcomes: length of first stage of labor, cesarean section rate, maternal satisfaction with childbirth, or Apgar score <7 at 5 minutes (strength of recommendation [SOR]: **A,** large meta-analyses of randomized controlled trials [RCTs] and a single RCT with conflicting results).

Amniotomy does result in about a 55% reduction of pitocin use in multiparous women, a small (5 minutes) decrease in the duration of second-stage labor in primiparous women, and about a 50% overall reduction in dysfunctional labor—ie, no progress in cervical dilation in 2 hours or ineffective uterine contractions (SOR: **A,** large meta-analyses of RCTs and a single RCT with conflicting results).

Amniotomy doesn't improve other maternal outcomes—instrumented vaginal birth; pain relief; postpartum hemorrhage; serious morbidity or death; umbilical cord prolapse; cesarean section for fetal distress, prolonged labor, antepartum hemorrhage—nor fetal outcomes—serious neonatal morbidity or perinatal death; neonatal admission to intensive care; abnormal fetal heart rate tracing in first-stage labor; meconium aspiration; or fetal acidosis (SOR: **A,** large meta-analyses of RCTs and a single RCT with conflicting results).

Evidence summary

A meta-analysis of 15 RCTs (5583 women) compared intentional artificial rupture of the amniotic membranes during labor (amniotomy) with intention to preserve the membranes (no amniotomy). The study found no differences in any of the measured primary outcomes: length of first stage of labor, cesarean section, maternal satisfaction with childbirth, or Apgar score <7 at 5 minutes.[1]

Investigators included 9 trials with both nulliparous and multiparous women and 6 trials with only nulliparous women. Thirteen trials compared amniotomy with intention to preserve the membranes, and 2 trials performed amniotomy in the control group if the membranes were intact at full cervical dilation.

Amniotomy doesn't affect first-stage labor or cesarean risk

Five trials (1127 women) reported no difference in length of the first stage of labor between the amniotomy and no amniotomy groups (mean difference [MD]= –20 minutes; 95% confidence interval [CI], –96 to 55). Subgroups of primiparous and multiparous women showed no difference (MD= –58 minutes; 95% CI, –153 to 37 and MD= +23 minutes; 95% CI, –51 to 97, respectively).

Nine trials (5021 women) reported no significant difference in cesarean section risk overall or when compared by parity, multiparous vs primiparous (risk ratio [RR]= 1.27; 95% CI, 0.99-1.63). One trial (84 women) found no difference in maternal satisfaction scores with childbirth experience. Six trials

Amniotomy doesn't shorten spontaneous labor nor improve length of first-stage labor, cesarean section rate, or maternal satisfaction with childbirth.

(3598 women) that reported risk of low Apgar score (<4 at 1 minute or <7 at 5 minutes) found no difference overall (RR=0.53; 95% CI, 0.28-1.00), or when compared by parity (multiparous vs primiparous).

Investigators reported that the included trials varied in quality and described the following limitations: inconsistent or unspecified timing of amniotomy during labor, proportion of women in the control group undergoing amniotomy, and ≥30% of women not getting the allocated treatment in all but one of the trials.

Secondary outcomes: Amniotomy reduces oxytocin use

Eight trials (4264 women) evaluated oxytocin augmentation and found that amniotomy decreased its use in multiparous (RR=0.43; 95% CI, 0.30-0.60), but not primiparous, women.

Eight trials (1927 women) reported length of second stage of labor as a secondary outcome, with no difference overall (MD= –1.33 minutes; 95% CI, –2.92 to 0.26). Amniotomy produced a statistical but not clinically significant shortening in subanalysis of primiparous women (MD= –5.43 minutes; 95% CI, –9.98 to –0.89) but not multiparous women.

Three trials (1695 women) evaluated dysfunctional labor, defined as no progress in cervical dilation in 2 hours or ineffective uterine contractions. Amniotomy reduced dysfunctional labor in both primiparous (RR=0.49; 95% CI, 0.33-0.73) and multiparous women (RR=0.44; 95% CI, 0.31-0.62).

No differences found in other maternal and fetal outcomes

Investigators reported no differences in other secondary maternal outcomes: instrumental vaginal birth (10 trials, 5121 women); pain relief (8 trials, 3475 women); postpartum hemorrhage (2 trials, 1822 women); serious maternal morbidity or death (3 trials, 1740 women); umbilical cord prolapse (2 trials, 1615 women); and cesarean section for fetal distress, prolonged labor, or antepartum hemorrhage (1 RCT, 690 women).

Investigators also found no differences in secondary fetal outcomes: serious neonatal morbidity or perinatal death (8 trials, 3397 women); neonatal admission to neonatal intensive care (5 trials, 2686 women); abnormal fetal heart rate tracing in first stage of labor (4 trials, 1284 women); meconium aspiration (2 trials, 1615 women); and fetal acidosis (2 trials, 1014 women). Similarly, 1 RCT (39 women) that compared amniotomy with intent to preserve membranes in spontaneous labors that became prolonged found no difference in cesarean section, maternal satisfaction, or Apgar scores.

A few studies claim shorter labor with amniotomy

However, a later Iranian RCT (300 women) reported that early amniotomy shortened labor (labor duration: 7.5 ± 0.7 hours with amniotomy vs 9.9 ± 1.0 hours without amniotomy; *P*<.001) and reduced the risk of dystocia (RR=0.81; 95% CI, 0.59-0.90) and cesarean section (RR=0.82; 95% CI, 0.66-0.90).[2]

A similar Nigerian RCT (214 women) and an Indian RCT (144 women) both claimed that amniotomy also shortened labor (4.7 ± 0.9 hours vs 5.9 ± 1.3, and 3.9 ± 2 hours vs 6.1 ± 2.8 hours, respectively).[3,4] In neither trial, however, did investigators explain how the difference was significant when the duration of labor times overlapped within the margin of error. JFP

References

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