Research Summaries for Normal Birth

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ABSTRACT

In this column, the author summarizes four research studies relevant to normal birth. The topics of the studies summarized include the effect of obstetrician anxiety on cesarean surgery rates, the risks of routine membrane sweeping, beneficial effects of doula care for middle-class women, and the lack of reliability of continuous electronic fetal monitoring tracings.

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WOMAN'S RISK OF HAVING CESAREAN SURGERY MAY DEPEND ON HER OBSTETRICIAN'S PERSONALITY

- Allcock, C., Griffiths, A., & Penketh, R. (2008). The effects of the attending obstetrician's anxiety trait and the corresponding obstetric intervention rates. *Journal of Obstetrics and Gynaecology*, 28(4), 390–393.

Summary

In this retrospective observational study, researchers aimed to determine whether an individual obstetrician's anxiety level affects his or her likelihood of performing unplanned cesarean surgery. All live births occurring between 5:00 p.m. and 8:00 a.m. or on weekends in a university hospital in Wales were identified. The 3,135 births occurring under the care of fourth- and fifth-year “on-call registers” (equivalent to senior residents in the

U.S. system) were included in the analysis. An individual obstetrician's unplanned cesarean rate was calculated by dividing the number of cesarean surgeries occurring in women cared for by that doctor by the total number of women giving birth by any method who were cared for by that doctor during the specified time. The obstetricians were asked to complete a validated survey that measures “trait anxiety.” Trait anxiety is a stable and enduring feature of a person's personality and is distinct from “state anxiety,” which is situational or transient. Eleven of the 12 eligible obstetricians completed the questionnaire.

The doctors' unplanned cesarean rates ranged from 19% to 30%, with a mean of 23%. Trait anxiety scores ranged from 33 to 65, with a mean of 43. (The potential range is 20–80, with 20 representing the least anxious and 80 the most anxious personality). Statistical analysis revealed that the doctors' trait anxiety levels were highly correlated with cesarean rates. The obstetricians with the least anxiety had the lowest emergency cesarean rates, while

those with the most anxiety had the highest rates. The study unfortunately did not control for obstetrical and medical risk factors or other variables that might affect the need for cesarean surgery.

Significance for Normal Birth

A woman's risk for cesarean surgery should depend on how healthy she is, how healthy her baby is, and whether she develops complications in her labor. However, this study is yet another example in a growing body of literature showing that factors that have nothing to do with women or babies significantly alter the risk of surgical birth. In this case, a strong correlation was observed between the individual obstetrician's trait anxiety (i.e., anxious personality) and that physician's rate of performing cesarean surgery in labor. An association between an obstetrician's response to stressful situations and his or her cesarean rate is not surprising. Providers with less trait anxiety may be more willing to be patient or to try conservative measures with a slowly progressing labor, for example. They may also exude more confidence and trust, which may enhance a woman's ability to progress in labor in the first place. While more research is needed to confirm and explain the correlation, these data underscore the need for women to have access to intervention rates of specific providers. Choosing a provider with a moderate cesarean section rate (studies show and the World Health Organization states that the cesarean rate can safely be 10%–15%) will ensure that a woman can trust her care provider's judgment when cesarean surgery is recommended.

RANDOMIZED CONTROLLED TRIAL SHOWS MEMBRANE SWEEPING INCREASES RISK OF WATER BREAKING BEFORE LABOR

- Hill, M. J., McWilliams, G. D., Garcia-Sur, D., Chen, B., Munroe, M., & Hoeldtke, N. J. (2008). The effect of membrane sweeping on prelabor rupture of membranes: A randomized controlled trial. *Obstetrics and Gynecology*, 111(6), 1313–1319.

Summary

This randomized, controlled trial was designed to determine whether routine membrane sweeping at the end of pregnancy reduces the likelihood of women reaching 41 weeks, and whether the procedure has any adverse effects, specifically membrane

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rupture before labor. Participants were assigned to have their membranes swept weekly from 38 weeks ($n = 162$ women) or to have weekly vaginal exams with no membrane sweeping ($n = 138$ women). The trial was conducted in a U.S. Army medical center in Hawaii and included healthy women with uncomplicated pregnancies, singleton head-down babies, and reliable dating information (e.g., first trimester ultrasound). Both the providers who cared for the women in labor and the laboring women themselves were blinded to whether membrane sweeping had occurred. This was intended to minimize bias, although many participating women may have been aware of their group assignment, because membrane sweeping can be uncomfortable. The study protocol required that women in both groups who reached 41 weeks of gestation be induced for "impending postmaturity." Because of problems scheduling these inductions, about 8% of women in each group gave birth at or beyond 42 weeks.

Researchers found no association between assignment to routine weekly membrane sweeping and duration of pregnancy. The proportion of women in both groups who remained pregnant was nearly identical on every succeeding day of gestation. Likewise, mode of birth and maternal or newborn infection rates did not differ between the two groups. Women in the membrane-sweeping group were more likely to experience prelabor rupture of the membranes (PROM), although the difference was not statistically significant, meaning it could have occurred by chance (7% no-sweeping group vs. 12% sweeping group; $p = 0.19$). However, subgroup analysis revealed a significant effect. Fifteen percent of women assigned to have membrane sweeping were not dilated enough for the clinician to perform membrane sweeping. None of these women had PROM in the week following the cervical massage. When the researchers analyzed the women who were more than 1cm dilated (effectively excluding women who were not eligible for membrane sweeping), 9% of women in the membrane-sweeping group versus 0% of women in the no-sweep group experienced PROM, a difference that achieved statistical significance.

W In August 2008, the Coalition for Improving Maternity Services launched the Transparency in Maternity Care Project to help women gain access to cesarean-section rates and other facts about obstetric providers and facilities in their community. For more information, log on to the project's Web site (www.thebirthsurvey.com). Also, see Elan McAllister's guest editorial on pages 8–11 in this issue of the journal.

Significance for Normal Birth

Membrane sweeping is often offered to women as a routine measure or to prevent a pharmacologic induction for which a need may eventually arise (for instance, post-term or gestational hypertension). Membrane sweeping is believed to be effective because it results in the release of prostaglandins, which are hormone-like factors involved with initiating labor. A Cochrane systematic review showed that membrane sweeping seemed to hasten the onset of labor but conferred no clinically important benefits (e.g., mode of birth and maternal and newborn health were unaffected). Moreover, membrane sweeping resulted in an increase in the likelihood of pain, bleeding, and irregular contractions (Boulvain, Stan, & Irion, 2005). The Cochrane reviewers did not find an association with PROM. However, several of the included trials were of poor quality, and none of the trials was designed specifically to measure the effect of routine membrane sweeping on PROM.

This randomized, double-blind trial specifically examined the effect of membrane sweeping on PROM and indicated a significant association between routine, weekly membrane sweeping at the end of pregnancy and prelabor rupture of the membranes. Findings suggested that an increase in PROM will result in an increase in induction, the very intervention membrane sweeping is intended to avoid. Indeed, the researchers reported an increase in the membrane-sweeping group (25% vs. 32%), although the difference did not achieve statistical significance, probably because the study was too small. This problem is likely to be magnified by a recent change in the standard of care: In 2007, without citing any new research, the American College of Obstetricians and Gynecologists (ACOG) reversed its former position and declared that women presenting with PROM at term should be induced immediately (ACOG Committee on Practice Bulletins – Obstetrics, 2007).

DOULA CARE FOR MIDDLE-CLASS WOMEN WITH MALE PARTNERS SUBSTANTIALLY LOWERS CESAREAN RATE

- McGrath, S. K., & Kennell, J. H. (2008). A randomized controlled trial of continuous labor support for middle-class couples: Effect on cesarean delivery rates. *Birth*, 35(2), 92–97.

Summary

In this randomized, controlled trial, healthy, middle-class pregnant women expecting their first child were assigned to have either continuous support from a trained and certified doula ($n = 224$) or usual care ($n = 196$). Only three women had no labor companion of their choice, and in all but 29 women, the companion was her male partner. Thus, women in the doula group had support from their partners as well as a doula, while women in the usual-care group were accompanied by their partners but did not have the additional support of a doula. The women were primarily Caucasian (78%), married (88%), and educated (57% had college degrees). All women in both groups attended childbirth education classes in the Greater Cleveland area between 1988 and 1992. Researchers collected data about labor and birth outcomes from the medical chart. In addition, couples who had doula care in labor were asked to complete questionnaires before hospital discharge and approximately 6 weeks after giving birth. Eighty-eight percent of mothers returned both questionnaires. Among fathers, 81% returned the first questionnaire, while 76% returned the questionnaire sent at 6 weeks.

The doula group was significantly less likely than the control group to give birth by cesarean section (13% vs. 25%, a difference of 12%). Similar results were found when the researchers restricted their analysis to women accompanied by their male partners. Doulas had an even more marked effect on the likelihood of cesarean with induction. Ten of the 17 women in the control group who were induced gave birth by cesarean section compared with only 2 of the 16 women induced in the doula group, a highly significant finding (47% difference). Doula-supported women were also less likely to have epidural analgesia, although most women in both groups had epidurals (65% in the doula group vs. 76% in the control group; an 11% difference). Again, results were similar when the researchers restricted

Does immediate induction of labor after PROM improve outcomes? Read Henci Goer's critique of the TermPROM Study Group in her "When Research is Flawed" link (www.lamaze.org/research/WhenResearchIsFlawed) on the Lamaze International Web site.

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analysis to women who were accompanied by male partners. On the first postpartum questionnaire (administered before hospital discharge), all women and all of the male partners rated having a doula as “very positive” (93%) or “positive” (7%). All but two respondents rated having a doula as “very positive” or “positive” at 6 weeks postpartum.

Significance for Normal Birth

A large body of literature, including two well-designed systematic reviews (Hodnett, Gates, Hofmeyr, & Sakala, 2007; Simkin & O’Hara, 2002), provides overwhelming evidence for the benefits of continuous support in labor. However, previous studies have varied greatly in aspects of trial quality, population studied, and presence of other support people, and many of the trials have been conducted in countries with maternity care systems unlike systems in the United States. These variations raise the question of whether results apply to individuals who typically attend childbirth preparation classes. Moreover, in an era when male partners are usually present at birth, there is a lack of evidence as to whether doulas provide additional benefit. This new study provides compelling evidence that even when accompanied by their male partners, middle-class, first-time mothers, at least, benefit immensely from professional doula care. Specifically, even with epidural use and induction, they may markedly decrease their chances of having cesarean surgery. Moreover, these benefits are achieved with no loss in satisfaction by their male partners.

DESPITE SPECIALIST TRAINING, PERINATOLOGISTS AND OBSTETRICIANS CANNOT RELIABLY IDENTIFY BABIES IN TROUBLE USING CONTINUOUS FETAL HEART RATE TRACINGS

- Chauhan, S. P., Klauser, C. K., Woodring, T. C., Sanderson, M., Magann, E. F., & Morrison, J. C. (2008, July 28). Intrapartum nonreassuring fetal heart rate tracing and prediction of adverse outcomes: Interobserver variability [E-pub ahead of print; doi: 10.1016/j.ajog.2008.06.027]. *American Journal of Obstetrics and Gynecology*.

Summary

In this secondary analysis of a large prospective trial, researchers sought to determine whether doctors

who are knowledgeable about fetal monitoring guidelines and have considerable clinical experience can, after examining fetal monitoring tracings, accurately predict which infants will be compromised at birth or require immediate delivery. The researchers identified 100 tracings from women who were in labor with a singleton, head-down baby and a ruptured membrane. All of the tracings were deemed “nonreassuring” by the resident or attending staff, based on the presence of recurrent late or variable decelerations, bradycardia (slow heart rate), and/or loss of short-term variability of the fetal heart rate. All of these patterns are considered indicative of decreased fetal oxygenation. Depending on the clinical situation, either one or two segments of the continuous tracing were made available to the doctors participating in the study: the hour leading up to and including the nonreassuring pattern and another hour before birth, if the nonreassuring pattern improved. Four maternal-fetal medicine specialists and one obstetrician independently reviewed each tracing. The doctors had been in practice for an average of 17 years, not including their residencies, and all had independently reviewed the fetal monitoring guidelines developed by the National Institute of Child Health and Human Development’s Planning Workshop and adopted by the ACOG. Based on these guidelines, each participating physician determined the baseline and variability of the fetal heart rate and described any instances of acceleration, deceleration, bradycardia (slow heart rate), and tachycardia (fast heart rate). They also judged whether the tracing was overall “reassuring” or “nonreassuring.” Finally, each physician predicted whether the woman gave birth vaginally or by cesarean surgery and whether the infant was born with a low 5-minute Apgar score or with acidemic cord-blood values, which suggest decreased oxygen before birth.

Statistical analysis showed poor agreement among the five physicians for 7 of the 10 attributes of the fetal heart rate tracings. In particular, there was poor agreement about the baseline, the presence of accelerations or bradycardia, and whether and how significantly variability was decreased. The doctors only demonstrated good agreement over whether tachycardia was present. Moreover, the doctors did not agree on whether or not the tracings were reassuring overall. Finally, the physicians were unable to reliably predict which infants would be born compromised or the labor would end in cesarean birth. The researchers state, “With the use of

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the guidelines promulgated by the Evidence-Based Medicine Working Group, intrapartum FHR [fetal heart rate] monitoring is not a useful diagnostic test...for the identification of parturients who need emergent cesarean delivery or those who deliver a newborn infant with a low Apgar score or abnormal umbilical acid-base” (p. 1.e4–1.e5).

Significance for Normal Birth

Interobserver variability describes how different people can come to different conclusions given the same data. Diagnostic tests, such as those devised to identify fetuses in distress, should ideally have very little interobserver variability (i.e., people trained to interpret the test should generally agree on the findings and their significance). When this is not the case, the test is deemed not useful.

Continuous electronic fetal monitoring (EFM) became the standard of care in most maternity settings because it promised more information about the baby’s wellbeing and, thus, the theoretical possibility of intervening sooner and averting poor outcomes. However, EFM has fallen woefully short of these promises. It doubles the likelihood of cesarean surgery, with no corresponding benefit to babies. The failure has been attributed to lack of agreement among professionals about the significance of abnormal FHR tracings. The National Institute of Child Health and Human Development (NICHD) guidelines were intended to minimize observer variability by putting forth common definitions and nomenclature “so that the predictive value of monitoring can be assessed more meaningfully in appropriately designed observational studies and clinical trials” (NICHD Research Planning Workshop, 1997, p. 661). This study demonstrates that guidelines do not help, even in the hands of experienced maternal-fetal medicine specialists. Partly, this is because interpretation and evaluation, especially

in equivocal situations, continue to depend on clinician judgment. But even if that were not so, predictive value for newborn compromise would be poor. This is because nonreassuring FHR is only weakly associated with newborn condition (Goer, Leslie, & Romano, 2007). Moreover, compromised condition at birth almost never results in any clinically significant adverse outcome (Goer et al., 2007), and in cases where it does, the root cause often predates the labor. In short, because continuous EFM increases surgery rates without improving long-term infant outcomes, its routine use cannot be justified, and intermittent auscultation should be the standard of care.

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