Research Update

Recent Research Questions the Values of Routine Intervention

Mary Lou Moore, PhD, RNC, LCCE, FACCE, FAAN

MARY LOU MOORE is an associate professor in the Department of Obstetrics and Gynecology at the Wake Forest University School of Medicine in Winston-Salem, North Carolina.

Abstract

Under appropriate circumstances, intervention in labor and birth can be valuable, even lifesaving. But interventions can also become routine procedures. This paper reviews three recent studies in which the focus of research is common interventions: electronic fetal monitoring and epidural anesthesia. A fourth study reviewed here examines the effect of previous vaginal birth and fetal weight on the success of vaginal birth after cesarean.

Journal of Perinatal Education, 12(3), 46–49; *electronic fetal monitoring, epidural anesthesia, labor and birth interventions*.

Under appropriate circumstances, intervention in labor and birth can be valuable, even lifesaving. But interventions can also be merely routine procedures. These routine interventions merit re-examination to determine whether or not they truly serve a useful purpose. Three recent studies investigated interventions during labor and labor support from varying perspectives.

Electronic Fetal Monitoring [EFM]

EFM and Birth Outcome

The first study, conducted by Impey and colleagues (2003), examined the relationship between electronic

Success rates for vaginal birth after cesarean decreased as the size of the fetus increased.

fetal monitoring (EFM) and the birth outcome. When EFM was first introduced, the initial goal was to identify fetal distress during labor and, subsequently, allow timely intervention that would improve birth outcomes. However, expert panels in both the United States and Canada have recommended that EFM be limited to high-risk pregnancies (Canadian Task Force on the Periodic Health Examination, 1994; United States Preventive Services Task Force, 1989). Yet EFM continues to be widely used. Even in institutions where continuous EFM is not a part of labor monitoring for low-risk women, an admission assessment is almost always obtained, with the goal of identifying women who are at risk of poor birth outcomes. Impey and colleagues' (2003) carefully designed study from Dublin addressed the effect of this admission procedure. In this study, 8,580 women were randomized upon entry into the labor unit. One group received EFM on admission for 20 minutes. The other group received the unit's usual care regimen of intermittent fetal monitoring with a stethoscope. No difference occurred in infant death, the primary outcome of interest, or in moderate-to-severe neonatal morbidity (1.3% in each group). In addition, no difference occurred in the rate of cesarean births, instrumental deliveries, or episiotomies. Women who had EFM on admission were more likely to have continued EFM and fetal blood sampling (Impey et al., 2003). Thacker and Stroup (2003) provided a commentary on this study, stating, "The lessons learned too slowly from the experience with electronic fetal monitoring are relevant for admission cardiotocography. Increased information on admission will not necessarily lead to better clinical outcomes" (p. 445).

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EFM and Cerebral Palsy

When EFM was first introduced, a major rationale for employing this intervention was to reduce the incidence

of cerebral palsy. Nevertheless, the rate of cerebral palsy in developed countries has remained essentially the same over the past 30 years. However, some researchers and providers have questioned whether or not a reduction in cerebral palsy among term infants has been masked by increased survival among preterm infants who may be neurologically impaired. After reviewing the literature and analyzing term and preterm births, Clark and Hankins (2003) determined this hypothesis was incorrect for two reasons:

1. No change has occurred in the past 30 years in the incidence of cerebral palsy in term infants;
2. The prevalence of cerebral palsy in underdeveloped countries is the same or lower than in developed countries, even though, in most instances, the availability to respond to EFM data with an emergency cesarean delivery is limited or absent, assuming EFM data is available.

Further arguments are described in this paper.

Epidural Anesthesia

Epidural anesthesia is another intervention that provides pain relief; however, it has also been shown to increase the length of both the first and second stages of labor. A Swedish study conducted by Rahm, Hallgren, Hogberg, Hurtig, and Odland (2002) suggested that one mechanism for the prolongation of labor might be interference with the release of plasma oxytocin when epidural anesthesia is used. When Rahm and colleagues (2002) conducted their study, approximately 42% of primiparous women in Sweden used epidural anesthesia in 2000. This

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percentage is nearly double the number in 1995, when 22% of women used epidural anesthesia. Study participants were 34 healthy women with labor at term (37–41 completed weeks' gestation): 17 with epidural anesthesia and 17 controls. Women in the control group were matched with women in the epidural group for parity and the stage of cervical dilatation. Oxytocin in plasma was measured by radioimmunoassay before analgesia, 60 minutes later, and after the delivery of the placenta. No oxytocin augmentation was given to either group during the first hour. The researchers found that, although no difference occurred in oxytocin levels at the initiation of the study, at the end of the first hour, plasma oxytocin decreased in the epidural group and increased in the control group ($p=.028$). No difference was evident between groups in cervical dilatation at the one-hour mark.

Effects of Vaginal Birth after Cesarean

With rates of vaginal birth after cesarean (VBAC) decreasing, a group of researchers in Pennsylvania examined the effect of birth weight on VBAC success rates. Elkousy, Sammel, Stevens, Piepert, and Macones (2003) conducted a retrospective review of 9,960 women from 16 community and university hospitals during 1995–1999. The study was limited to women with singleton gestations who had one prior cesarean birth. The VBAC success rate for the entire group was 74%. For the analysis, women were divided into four groups. Women who had experienced a previous VBAC demonstrated a success rate of 94%, and women who had experienced a vaginal birth both before and after the cesarean birth

demonstrated a VBAC success rate of 93%. A third group—women who had experienced vaginal birth before their cesarean birth—demonstrated a success rate of 83%. The lowest success rate, 65%, was demonstrated in a fourth group of women who had experienced no previous vaginal births before the cesarean birth (see Table).

Success rates for all four groups decreased as the size of the fetus increased (Elkousy et al., 2003). In the group of women with no previous vaginal births, success rates also decreased when the indication for the previous cesarean birth was cephalopelvic disproportion or failure to progress, or when induction or augmentation of labor occurred. Women in this group with birth weights ≥ 4000 gms (8 pounds, 13 ounces) had a rate of uterine rupture more than twice as high as the entire group (RR 2.3; $p<.001$). The uterine rupture rate in this group was 3.6%.

Summary

Each of the studies reviewed here provides evidence to answer questions presented by prospective parents:

- Does routine EFM on admission improve birth outcome? Impey and colleagues (2003) found that, while EFM on admission does not improve birth outcome, admission cardiotography increases the chances of continuing EFM during labor and sampling fetal blood.
- Has the use of EFM led to a decrease in cerebral palsy in the United States? Clark and Hankins (2003) suggested that it has not.

Table VBAC Success by Birth History and Fetal Weight

Group #	Group Description	Successful VBAC (%)	Success X Birth Weight VBAC (%)			
			≤ 4000 g	4000-4249 g	4250-4500 g	>4500 g
1.	Previous VBAC	94	94	94	83	83
2.	Previous Vaginal Birth before Cesarean Birth and Previous VBAC	93	93	85	83	100
3.	Previous Vaginal Birth before Cesarean Birth	83	85	70	73	63
4.	No Previous Vaginal Birth	65	68	52	45	38
Total VBAC Success		74				

- Does epidural anesthesia suppress endogenous oxytocin? Rahm and colleagues (2003) found that, in the first hour after administration, epidural anesthesia does suppress endogenous oxytocin.
- What variables do pregnant women need to consider in deciding about VBAC? Elkousy and colleagues (2003) found that previous birth history and the estimated weight of the fetus can be important in a successful VBAC.

While no single study should be considered the final answer to any question, the issues raised in these studies merit consideration.

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