The Influence of Practice Management on Primary Cesarean Birth

Michael L. Socol, MD

As the cesarean delivery rate has increased to once unimaginable levels, obstetricians should question the loss of our credibility. Older mothers, obesity, larger birth weights, too many twins, and no more breech vaginal deliveries have all been cited as contributing factors to the increase in primary cesarean birth, but one cannot neglect the influence of physician practice style. Attempts to curtail or reverse the escalating incidence of primary abdominal deliveries should focus on caution with inductions of labor, patience with the management of arrest disorders, more accurate assessment of fetal compromise, patient education and informed decision making about the benefits/risks of operative delivery, and improvement in the medicolegal environment.

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What have we done? The national cesarean delivery rate has escalated to a level once thought to be unimaginable. Nearly one-third of nulliparous women are now delivered abdominally. The cesarean delivery rate across South Florida approaches 50%. The average age at which obstetricians stop delivering babies is only 48 years. Are obstetricians at risk of losing their credibility? Are our clinical skills deteriorating? Are there any reasonable solutions in sight?

A good place to begin is with the experience at the Northwestern Memorial Hospital. By 1986, the primary cesarean delivery rate had increased to 27.3%, which was higher than the national average and the rate in the state of Illinois. Physician leadership was concerned about this trend, and a number of initiatives were implemented—support and encouragement of vaginal birth after cesarean delivery, a prospective randomized trial of the Active Management of Labor program for nulliparous parturients, and the distribution of individual physician cesarean delivery rates to every obstetrician in an effort to influence physician practice style. An interesting observation was noted in the Active Management of Labor trial. We were able to demonstrate a decline in cesarean delivery rate from 14.1% in the control group patients to 10.5% in those in whom labor was actively managed; however, perhaps more importantly, we had expected a cesarean delivery rate of 18% in the control group based on the experience of previous years. In other words, a Hawthorne effect occurred as physicians’ behavior and cesarean delivery rates were being observed.

Demographic characteristics of our patient population are enumerated in Table 1. From 1986 to 1991, the total cesarean delivery rate at the Northwestern Memorial Hospital declined from 27.3% to 16.9% (by 1996, it was further reduced to 15.4%). The primary cesarean delivery rate dropped from 18.2% to 10.6%, and the repeat cesarean delivery rate was reduced from 9.1% to 6.4%. The corresponding primary cesarean delivery rates according to payer status and parity are delineated in Table 2. Rates were reduced for all indications—dystocia, from 8.8% to 4.8%; fetal heart rate abnormalities, from 2.8% to 1.4%; malpresentation, from 3.4% to 2.7%; other (multiple gestation, placenta previa, herpes, etc), from 3.3% to 1.7%. During this same time frame, the cesarean delivery rates in the state of Illinois hardly budged—total, 23.2%-22.9%; primary, 14.4%-13.7%; repeat, 8.8%-9.2%.

If we fast-forward to 2010, the number of women delivering at the Northwestern Memorial Hospital has peaked at 12,365. The primary, repeat, and total cesarean delivery rates are now 17.0%, 10.8%, and 27.8%, respectively. What factors are contributing to the national rise in primary abdominal deliveries? Answers to this question could include no more breech vaginal deliveries, too many twins, fear of litigation, patient preference, and loss of clinical skills. Where can remedies be found? The most fruitful areas would appear...
to be cautious with inductions of labor, patience with the management of arrest disorders, more accurate assessment of fetal compromise, patient education and informed decision making about the benefits/risks of operative delivery, and improvement in the medicolegal environment.

**Inductions of Labor**

There is some controversy as to the magnitude of increased risk for cesarean delivery associated with induction of labor in nulliparous women. Seyb et al\(^6\) compared parturients in spontaneous labor at term with 2 cohorts of patients at term undergoing elective and medical inductions of labor. There was an approximately 2-fold increase in abdominal delivery, with corresponding cesarean delivery rates of 7.8%, 17.5%, and 17.7%, respectively. In contrast, Osmundson et al\(^7,8\) contend that when investigating the risk associated with induction of labor at term, the appropriate control group is one of patients of similar gestational age who are managed expectantly, some of whom will most probably eventually require induction of labor for postdates or other obstetric indications. With this study design, there was no difference in the outcome between those patients whose labor was induced at term and those whose pregnancy was managed expectantly, regardless of whether the cervix was favorable (cesarean delivery rates for induction vs expectant observation, 20.8% vs 20.1%) or unfavorable (43.1% vs 34.3%).

If a multiparous patient is at \(\geq 39\) completed weeks of gestation, with a favorable cervix, induction of labor for even social reasons carries little, if any, increased risk of operative intervention. However, this may not be true for first-laboring women. As a result, the accoucheur should always be wary of nulliparas and remember that patience is a virtue in both the antepartum period and labor. If one plans to use cervical ripening agents before 41 completed weeks of gestation in nulliparous women without a clear obstetrical indication for intervention, it is probably best to refrain.

**Arrest Disorders**

Dystocia is the most common indication for primary cesarean delivery. Some might argue that obesity, older mothers, and higher birth weights have been the major contributing factors to the rise in cesarean birth for dystocia, but one cannot neglect the potential influence of physician practice style. Simon and Grobman\(^9\) examined a cohort of nulliparous women undergoing induction of labor, 49% of which were elective interventions. The latent phase of labor was defined as starting at the time after both oxytocin had been initiated and amniotomy had been performed, and concluded when the cervical examination had progressed to 4-cm dilation and 80% effacement or 5-cm dilation if less effaced. Ninety-one percent of parturients completed the latent phase of labor within 15 hours, but it was not until the latent phase of labor surpassed 18 hours that the cesarean delivery rate exceeded 50%.

Arrest of labor in the active phase of labor has historically been considered as the lack of cervical dilation over 2 hours in the presence of adequate uterine contractions. Rouse et al\(^10\) questioned this concept and instituted a protocol that mandated at least 4 hours of oxytocin augmentation, with a sustained uterine contraction pattern of \(\geq 200\) Montevideo units, or 6 hours of oxytocin augmentation, regardless of the uterine contraction pattern, before a cesarean delivery was performed for labor arrest. Parous women with no progress despite 2 hours of oxytocin augmentation still had a vaginal delivery rate of 91%, whereas nulliparas had a vaginal delivery rate of 74%. Even with no labor progress 4 hours after the initiation of oxytocin augmentation, 88% of parous women and 56% of nulliparas eventually delivered vaginally.

Rouse et al\(^11\) also examined maternal and perinatal outcomes as a function of the duration of the second stage of labor. This secondary analysis of a clinical trial of pulse oximetry included only nulliparous women at \(\geq 36\) weeks of gestation whose labor was either spontaneous or induced. Ninety-one percent of women were delivered by 3 hours, with an abdominal delivery rate of 3.9%. Only 9% of parturients experienced a second stage of labor of 3 hours or longer, but the cesarean delivery rate did not exceed 50% until 5 hours. The authors concluded that the second stage of labor need not be terminated solely for duration.

Clearly, these data taken together with the observations of Zhang et al\(^12\) compel health care providers to reconsider the Friedman curves, which were constructed at a time when patient characteristics, clinical practices, and labor management were quite different. The ramifications of the lack of patience are clear. Unfortunately, one cannot also help but worry that our clinical skills are being lost. Most young obstetricians do not feel comfortable or even understand the mechanics of delivering a nonvertex second twin. Many residency programs frown on instrumental vaginal delivery or limit the option to the use of vacuum. This is despite no evidence that vacuum is safer for the fetus and data to suggest that the risks of adverse neonatal neurologic outcomes are

**Table 1 Parity and Payer Status of Northwestern Population**

<table>
<thead>
<tr>
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<th>1986</th>
<th>1991</th>
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<tbody>
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<td>Patients</td>
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<td>4669</td>
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<tr>
<td>Parity</td>
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<td></td>
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<tr>
<td>Nulliparous</td>
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<td>48.0%</td>
</tr>
<tr>
<td>Multiparous</td>
<td>52.6%</td>
<td>52.0%</td>
</tr>
<tr>
<td>Payer status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>68.6%</td>
<td>72.0%</td>
</tr>
<tr>
<td>Clinic</td>
<td>31.4%</td>
<td>28.0%</td>
</tr>
</tbody>
</table>

**Table 2 Change in Primary Cesarean Delivery Rate by Payer Status and Parity**

<table>
<thead>
<tr>
<th></th>
<th>1986</th>
<th>1991</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>20.2%</td>
<td>12.1%</td>
</tr>
<tr>
<td>Nulliparous</td>
<td>31.4%</td>
<td>19.9%</td>
</tr>
<tr>
<td>Multiparous</td>
<td>10.6%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Clinic</td>
<td>13.8%</td>
<td>6.7%</td>
</tr>
<tr>
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<td>23.7%</td>
<td>11.7%</td>
</tr>
<tr>
<td>Multiparous</td>
<td>4.6%</td>
<td>5.2%</td>
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</table>
comparable\textsuperscript{13} or even reduced\textsuperscript{14} with forceps compared with either vacuum-assisted vaginal delivery or cesarean section.

**Fetal Heart Rate Monitoring**

One thing is certain about electronic fetal heart rate monitoring—it has not lived up to its expectation! Leading academicians in the 1970s predicted that the incidence of cerebral palsy and mental retardation would be reduced by 50%. In retrospect, this was faulty reasoning, as probably only 10% of cases of cerebral palsy (or 2 per 10,000 births) are related to intrapartum oxygen deprivation, and the most common etiologies of mental retardation are chromosomal or congenital aberrations. A normal fetal heart rate tracing is highly predictive of the fact that the fetus is well oxygenated at that moment, and electronic fetal monitoring has essentially eliminated intrapartum stillbirths, which at one time occurred in 1 per 1000 labors. In contrast, the incidence of intrapartum oxygen deprivation severe enough to cause fetal damage is so low that the false-positive rate for a concerning tracing is 99%.\textsuperscript{15,16}

A 2-day workshop sponsored by the Eunice Kennedy Shriver National Institute of Child Health and Human Development, the American College of Obstetricians and Gynecologists, and the Society for Maternal-Fetal Medicine was convened in April 2008 to revisit nomenclature, interpretation, and research recommendations for intrapartum electronic fetal heart rate monitoring.\textsuperscript{17} A 3-tier system for fetal heart rate tracing interpretations was proposed, as were standard definitions so that all obstetric health care providers speak a common language. However, the bedside clinician is still faced with a technology that is too imprecise. Category III tracings (absent variability with recurrent late decelerations, recurrent variable decelerations, or bradycardia; or sinusoidal pattern) are predictive of abnormal fetal acid–base status and require prompt evaluation with either prompt resolution or delivery. However, the majority of, if not all, fetal heart rate tracings will be classified as category II at some point during labor, and these are the ones that pose more of a challenge. Pulse oximetry was investigated as a diagnostic aid and failed. The Maternal-Fetal Medicine Units Network is currently evaluating the utility of elevated ST segments on the fetal electrocardiogram. Scalp stimulation remains reassuring if an acceleration is elicited, but the false-abnormal rate is high.

How then can one determine whether nonreassuring fetal heart rate is being overdiagnosed and the rate of intervention is too high? Ultimately, the answer becomes the peer review process. Assuming an incidence of cerebral palsy of 2 per 1000 births, intrapartum oxygen deprivation as a cause in only 10% of cases, and a false-positive rate with electronic fetal heart rate monitoring of 99%, this equates to a cesarean delivery rate for fetal heart rate concerns of about 2%. A frequency of intervention much higher than this rate raises concern about the quality of practice or physician practice style.

**Patient Preference**

Has cesarean delivery become so safe an operation that patients have the right to choose abdominal delivery? Patient autonomy allows the right to decline an operation. However, does autonomy empower the patient to pursue a strategy if beneficence (in this case, benefit to mother or child) cannot be substantiated?\textsuperscript{18,19} The National Institutes of Health State-of-the-Science Conference: Cesarean Delivery on Maternal Request was held in March 2006.\textsuperscript{20} With the exception of 3 outcome variables with moderate-quality evidence (maternal hemorrhage, maternal length of stay, and neonatal respiratory morbidity), all remaining outcome assessments were based on weak evidence. The panel concluded that “each woman deserves individualized counseling consistent with ethical principles and based on the available scientific data when discussing the risk/benefit ratio and the option of cesarean delivery on maternal request.”

However, engaging in counseling is not synonymous with acquiescing to patient concerns. While a woman’s values and cultural concepts must be respected, patients also need to understand that abdominal delivery is not a preventive strategy. The risks of a permanent Erb palsy or cerebral palsy related to labor are small, both approximately 2 per 10,000 births. The etiology of urinary incontinence is multifactorial and includes factors such as patient weight, genetics, and pregnancy itself. A protective effect of cesarean delivery remains unproven. Furthermore, cesarean delivery carries risk not only in the index pregnancy but more so in future pregnancies with the life-threatening complications of placenta accreta and hysterectomy rising with the number of uterine incisions.\textsuperscript{21}

It has been estimated, albeit with little confidence, that 4%-18% of cesarean deliveries are performed on maternal request.\textsuperscript{20} Some would contend this rate of elective operative delivery is excessive and deleterious, but others would disagree. Each obstetrician who supports cesarean delivery on maternal request should ask whether it is for maternal or fetal benefits or fear of litigation.

**Medicolegal Environment**

Has the physician–patient relationship deteriorated from one of advocacy to adversary? Obstetricians cannot help but frequently ponder the legal ramifications of their decision making and actions. The question becomes how heavily does this influence physician practice style?

A potpourri of reforms have been proposed for the medical liability system in an effort to address inefficiency, cost, nonmeritorious suits, and inconsistency of jury awards.\textsuperscript{22} However, the remedies proposed to date have been received lukewarmly, and in most cases, the impact has been negligible. These include joint-and-several liability reform to limit the financial liability of each defendant to the percentage of fault that the jury assigns and, thus, minimize the “deep pocket;” collateral-source rule reform to eliminate double compensation if a plaintiff has already received reimbursement from other sources, such as health insurance; periodic payment so that malpractice awards can be paid over time rather than as a lump sum; certificate-of-merit affidavits to reduce nonmeritorious suits; and pretrial screening panels. A debate about the utility of caps on noneconomic damages, or pain and suffering, would spur heated emotions on both sides, but this approach has been shown to be an
effective means of reducing awards to plaintiffs and reducing professional liability insurance.23 An additional patient benefit might be a reduction in cesarean deliveries, as there are some data to support that a reduction in insurance premiums is associated with more vaginal deliveries.24,25 However, in states such as Illinois, these caps have repeatedly been found unconstitutional.

An intriguing concept, advocated by Howard,26 author of From Common Good, is special health courts whereby experienced judges, not medically unsophisticated juries, would adjudicate cases with complex medical issues. Deliberation would be influenced by science, not visceral emotion. These courts already exist in areas such as bankruptcy, divorce, and worker’s compensation, but these are all outside the realm of tort law. Lawyers would further argue that the founding fathers of our country feared the concentration of too much power into the hands of judges could be abusive, and thus the right to trial by a jury of one’s peers is protected by the Seventh Amendment to the Constitution.

A simple fact is that no medical negligence allegation can proceed forward without an expert witness. There are clearly too many “experts” for whom swearing to tell the truth is a meaningless exercise. Too many experts are making statements that would never be accepted in front of the peer review committees in their own hospitals, and they are making exorbitant amounts of money. Our professional organizations need to be more proactive. Pretrial affidavits are of questionable benefit, and censure occurs after the damage is already done. One suggestion would be to put forward a broad panel of clinicians, endorsed by our parent organizations, from which experts could be chosen to evaluate the medicine and not be an advocate. Inapposite testimony would lead to removal from the panel, and there would also be a limit on the frequency of testimony in deposition or trial to eliminate professional witnesses.

In the meantime, obstetric health care providers need to remember the importance of documentation. Plaintiff attorneys will interpret an omission as it “was not done.” Attention to the progress of labor and interpretation of fetal heart rate patterns is imperative as is clarity about the management plan, rationale for decision making, and informed consent.

**Transparency**

Transparency to facilitate consumer awareness has arrived. Hospitals are now required to monitor and report elective deliveries at <39 completed weeks of pregnancy and cesarean delivery rates for low-risk first-birth women. The publishing of individual physician cesarean delivery rates may be next in an effort to modify practice style. We cannot let self-interests supersede the quality of health care and the best patient experience. If we do not stand at the forefront, others will take the lead from us.

**References**


