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Myth of the ideal cesarean section rate: Commentary and historic perspective

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Attempts to define, or enforce, an "ideal" cesarean section rate are futile, and should be abandoned. The cesarean rate is a consequence of individual value-laden clinical decisions, and is not amenable to the methods of evidence-based medicine. The influence of academic authority figures on the cesarean rate in the US is placed in historic context. Like other population health indices, the cesarean section rate is an indirect result of American public policy during the last century. Without major changes in the way health and maternity care are delivered in the US, the rate will continue to increase without improving population outcomes.

Since the earliest days of the modern cesarean section—the 1880s—there has raged within the profession a debate about the appropriate indications for this operation.[1,2] For several decades after the availability of antibiotics and blood banking, the cesarean section rate in the US remained in the 4% to 6% range. Between 1968 and 1978, the rate tripled to 15.2%, and discussion of cesarean section moved permanently into the public domain. A 1981 report commissioned by the National Institutes of Health (NIH) expressed concern about the rising rate, and its recommendations for reducing cesareans included qualified support for VBAC.[3] By the 1990s, individual hospital cesarean section and VBAC rates were being published, and interpreted by consumer groups as indicators of obstetric care quality. In 1991, the Healthy People 2000 initiative advocated a 15% cesarean rate as a US health promotion objective by the year 2000.[4]

Despite expert and lay opinion that many cesareans are unnecessary, the rate continues to increase in the US—exceeding 27% in 2004—and shows no sign of abating.[5,6] Indeed, there is growing discussion and acceptance of patient-choice cesarean section as a legitimate birth option.[7,8] A recent editorial opined that "It's time to target a new cesarean delivery rate."[9]

It is the premise of this essay that attempts to define, or enforce, an "ideal" cesarean section rate are futile, and should be abandoned. It will be argued that the cesarean rate is a consequence of individual value-laden clinical decisions, and that it is not amenable to the methods of evidence-based medicine. The influence of academic authority figures on the cesarean rate in the US will be placed in historic context. Like other population health indices, the cesarean section rate is an indirect result of American public policy during the last century. Without

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The cesarean section rate—Historic perspective

Until Sänger standardized a technique for the "classical" operation in the early 1880s, cesarean section was a procedure of last resort in cases of absolute cephalopelvic disproportion—with maternal mortality rates exceeding 80%. The application of surgery to midwifery attracted bold and ambitious personalities, and early reports reflected the views of enthusiasts. Thus, Noble (Philadelphia) could write in 1893 "…the cesarean section done by the expert before or early in labor is scarcely more dangerous than the average of labors as at present conducted in our great cities."[10] Contemporary critics pointed out that the operation was far more dangerous in the hands of the occasional operator—often summoned to perform a cesarean after failed attempts at vaginal delivery.[1]

By the early 1900s, maternal mortality following elective cesarean section had decreased to 3% to 4% in specialty hospitals. Abdominal delivery was now being performed for placenta previa, eclampsia, and often by the earnest wish of the mother to have a living child at any risk. Reynolds (Boston) created a stir in 1906 by advocating elective cesarean "in an exceedingly small class of overcivilized women in whom the natural powers of withstanding pain and muscular fatigue are abnormally deficient."[11]

Despite such rhetoric, the weight of authority in the matter of cesarean section was on the side of conservatism until quite recently. Academic leaders preached, as did Williams, that "the excellence of an obstetrician should be gauged not by the number of cesareans which he performs, but rather by those which he does not do."[12] Forged during the pre-antibiotic, pre-transfusion era, this view naturally reflected a greater concern for maternal over fetal well-being. J. Whitridge Williams—through his position as obstetrician-in-chief at Johns Hopkins (1899-1931), his eponymous textbook, his former residents, and the force of his personality—was the most influential protagonist in this debate. Early in his career, he had championed the wider use of cesarean section as a safer alternative than craniotomy, symphysiotomy, or high forceps in cases of cephalopelvic disproportion. Williams later became a formidable curmudgeon, using every forum to deplore the elective use of episiotomy, forceps, induction, and podalic version.[13] However, he reserved his most scathing comments for those who advocated widening the indications for cesarean section. Discussing an article by Davis (Philadelphia) in 1919, he stated "Anybody who can use his hands and has a few tools can do a cesarean section…I take much more pride in getting my borderline cases through spontaneously than I do opening their abdomens."[13]

By insisting that disproportion was the only legitimate indication for cesarean section, Williams maintained a cesarean rate of 0.9% between 1900 and 1921.[14,15] Knowing that the maternal risk of cesarean increased in proportion to the duration of labor—yet unwilling, as a matter of principle, to forego a trial of labor in borderline cases—he achieved respectable mortality rates only by performing hysterectomy after 31% of his operations. For 30 years, Williams exerted a near monopoly in filling the nation's major chairs of obstetrics and gynecology,[16] and his legacy kept the cesarean rate low for decades after his death in 1931.

Defining an ideal cesarean section rate

Although, as Cosgrove (New Jersey) observed in 1939, "no case should ever be decided with one eye on the statistics of the hospital," academic obstetricians have long offered opinions about the ideal cesarean section rate.[17] During the late 1940s, Plass (Iowa)—who trained under Williams—believed that 4% to 5% was close to the ideal rate of cesarean section.[18] Not surprisingly, this was the incidence that prevailed on his teaching wards, and in those of most large hospitals during that period. It was an open secret, however, that the indications for cesarean were more liberal on the private service—with rates rumored to be as high as 15%.[19] In 1995, 23 experts agreed that the cesarean rate was too high, and proposed guidelines for the appropriate utilization of cesarean section.[5] Most of their recommendations were clinically sound, but none were truly evidence based.

In theory, it should be possible to calculate a rate that would minimize the sum of all maternal and fetal risks. In practice, it is difficult to define and measure any but the obvious physical complications. The traditional iatrocentric view of morbidity has focused on adverse events that prolong hospital stay or require readmission. Relatively little has been published about lesser degrees of morbidity from the mother and child's perspective: their quality of life—physical and psychologic, short-term and long-term—after delivery. Such factors are difficult to quantify, yet as long ago as 1913, DeLee (Chicago) believed that "the psychic influence of labor should be given a prominent place in our deliberations when seeking a mode of delivery."[20]

Even if it were possible to obtain reliable morbidity data, what level of maternal risk contraindicates abdominal delivery for fetal indications? Conversely, is there a degree of fetal risk from vaginal birth that mandates cesarean section? What level of long-term maternal morbidity associated with vaginal birth (eg, genital prolapse) outweighs the surgical risk of cesarean section?

Most important, who decides? The wide range of cesarean section rates internationally—and by different birth attendants, even within the same hospital—supports the notion that individuals—parents and providers alike—perceive the same level of risk differently.

The cesarean rate is, thus, a consequence of subjective clinical decisions, and cannot be preordained. An ideal cesarean rate cannot be defined outside a framework of individual values and assumptions.

Cesarean section rates and evidence-based medicine

In 1972, Cochrane singled out obstetrics and gynecology as the specialty least influenced by evidence.[21] In the years since, many academic careers have been founded on the application of statistical methods to obstetrics, and evidence-based medicine dominates clinical teaching—if not often clinical practice. Can such techniques be brought to bear on the cesarean section rate?

Cesarean section and randomized controlled trials

Critics of the high cesarean rate cite observational studies showing cesarean section to be more dangerous for mothers than vaginal delivery. As long as abdominal delivery is regarded as a procedure "of necessity," it will be performed under suboptimal conditions, increasing its morbidity, and decreasing its potential benefits to the fetus. This has prompted calls for a large randomized controlled trial (RCT) of planned cesarean at term in a general obstetric population. Besides yielding more reliable risk data—short-term, and in subsequent pregnancies—such a study might confirm what most obstetricians believe: that many developmental handicaps are unrelated to birth asphyxia or trauma.

If it could be agreed that elective cesarean section yields better results for babies, with little increased risk to their mothers, birth could be reduced to a simple clinical algorithm—labor would become just another deviation from protocol, as already happens in breech presentation. On the face of it, a cesarean section is just an alternate way of delivering babies. Yet discussion about this topic is rarely dispassionate: elective cesarean section challenges the central paradigm of midwifery—that pregnancy, labor, and delivery are physiologic processes that should be allowed to proceed without interference in the absence of specific indications. It can be anticipated that many women, and their providers, would refuse to participate in research involving elective cesarean in low-risk women—thereby compromising the external validity of the trials. Because the fetal benefits of cesarean section follow a law of diminishing returns, it would appear sensible to limit clinical trials to groups of women already at high risk for cesarean.

An RCT requires a hypothesis that is testable in the real world: it should be simple, specific, and stated in advance.[22] On those grounds, there is no direct way to test the hypothesis that there is an ideal cesarean section rate. Because the cesarean rate is calculated post-hoc, it is also impossible to design a prospective trial comparing specific cesarean rates. Conceptually, one might set up a large RCT with multiple arms, each having a different proportion of women by intended method of delivery, eg, 100% elective cesarean versus 0% planned vaginal birth, 80/20, 50/50, etc. For specified outcome variables, an ideal cesarean rate could then be estimated retrospectively. It is clear that the ideal rate will depend on which women are studied, and how much weight is given to maternal versus fetal morbidity—all subjective criteria.

Theory versus practice: RCT versus clinical judgment

The recent emphasis on evidence-based medicine has tended to overshadow the need for individualization in obstetrics. RCTs provide information about populations, but cannot replace clinical judgment. Even if it is true, for example, that cesarean section is generally safer for babies in breech presentation, neither mother nor child would be well served by emergency surgery performed when the breech is on the perineum. Although RCTs provide the highest level of evidence, their external validity is often limited by small sample size and the recruitment biases inherent to the research process. Furthermore, investigators are not a random sample of providers. In the statistical spirit of our time, it is probably fair to say that clinical judgment and technical ability are normally distributed within the profession. These attributes are not often equally developed in the same individual, nor is there any evidence that academic achievement correlates positively with clinical excellence. In light of such confounding factors, it is prudent to maintain a degree of skepticism about the conclusions of any study.

The future of cesarean section

"…we have all regretted that we have not done a cesarean in certain cases, but I have yet to regret one that I have done."[23]

Few obstetricians would disagree with this sentiment, expressed by a prominent New York obstetrician in 1920. Given this attitude, is there an upper limit to the cesarean rate? As the obstetric population becomes older, heavier, and increasingly primiparous, the cesarean rate in the US will continue to rise. This trend will be accentuated by the reluctance, or inability, of obstetricians to perform

operative vaginal deliveries. Patient-choice cesarean will become routine in women already at high risk for intervention. Because pregnancy and labor are "normal" only in hindsight, it will be difficult for obstetricians to deny requests for elective cesarean from women with no traditional risk factors. Within the profession, the malpractice crisis gets a good share of blame for the rising cesarean rate.

The malpractice crisis

Failure to perform a cesarean section in a timely manner is such a common allegation in cases of birth trauma or asphyxia that obstetricians can hardly be blamed for practicing a "when in doubt, cut it out" philosophy. Yet, the number of paid obstetric claims reported to the National Practitioner Data Bank has not changed substantially in the past 13 years, averaging 1 per 3100 births. Because litigation proceeds from adverse outcomes, there appears to be a mismatch between the cesareans performed and the women or babies who might benefit from them. Meaningful tort reform is intrinsically linked to public policy, and not on the short-term political horizon.

Quality improvement

It is time to stop talking about "target" or "ideal" cesarean rates. Such numbers may be of interest to epidemiologists and academic leaders, but they don't help clinicians make decisions in the labor room. Censuring physicians or hospitals on the basis of crude cesarean rates is a time-honored activity that does nothing to improve care. No one should criticize an obstetrician's decision to operate without a thorough review of each case. In practice, such scrutiny is usually reserved for "sentinel" events. Because the latter are infrequent—and good luck alone prevents the worst consequences of bad obstetrics—the quality improvement process would be better served by examining a random sample of individual charts for deficiencies of obstetric conscience, judgment, and documentation.

Public policy and the cesarean section rate

For the past 100 years, the US has lagged behind other industrialized countries in every measure of health care quality, including maternal and neonatal mortality. It is a sad indictment of our national priorities that millions of working Americans have no health insurance and inadequate prenatal care. In Europe, better perinatal outcomes are achieved with lower cesarean rates and less spending on health care. In those countries, midwives manage most low-risk pregnancies, with obstetricians acting as consultants. How did procedure-oriented specialists come to perform midwifery and well-woman care in the US?

A hundred years ago, most births occurred in the home. The apparent simplicity of obstetrics contributed to its poor teaching ("see one, do one"), low status and remuneration. DeLee—after Williams, the foremost academic leader of the day—believed that obstetrics would never achieve respect as a profession until "the pathologic dignity of pregnancy" was recognized.[19] This meant accepting the premise that most pregnancies are potentially abnormal, and must be managed by experts in order to achieve good results. This view of parturition deliberately excluded the midwife, who was systematically eliminated by organized medicine on the grounds that she was poorly trained, and a threat to the developing "science" of obstetrics. Residency training programs multiplied as births moved to hospitals during the 1920s and 30s. Creation of the American Board of Obstetrics and Gynecology in 1930 formalized the notion that obstetrics was a specialty practiced by surgeons. By the 1950s, birth in America had become a standardized hospital ritual, presided over by procedure-oriented male doctors in solo, fee-for-service practice. High-volume obstetrics was, and remains, the bread-and-butter of community specialists—its drudgery offset by the prospect of a busy gynecology practice in middle age. For specialists, this was the golden era of obstetrics in America: having successfully promoted themselves as the sole purveyors of expert maternity care in this country, obstetricians took credit for the improvements in maternal and fetal welfare observed between 1940 and the 1970s. It has become apparent during the last few decades that more subspecialization, more technology—and more cesarean sections—have not yielded commensurate benefits to the population. They have, instead, raised patient expectations of perfect outcomes to unrealistic levels, further fueling litigation.

This impasse presents an opportunity to reexamine the way obstetrics is practiced in the US. In contemplating change, a major goal—after improving access to health care—would be to offer American women more maternity care options than exist presently in most areas. Although trained midwives provide safe obstetric care, with lower cesarean section rates, they attend only 7% of births in the US—working mostly in environments where they don't compete economically with doctors.

So long as most women with health insurance are not complaining about their care, there is little political incentive to change the American way of birth and its high cesarean rate. However, other forces are creating a shortage or maldistribution of maternity care providers, and this will spur a demand for alternative solutions: fewer family practitioners deliver babies; increasing subspecialization is reducing the number of generalists and marginalizing their role in larger centers. In truth,

the average obstetrician-gynecologist compares poorly to the family practitioner in the breadth of her training for primary care, and there is little office obstetrics and gynecology that cannot be performed competently by midlevel providers. In teaching hospitals, the reduced work schedule of residents is creating service needs that can only be addressed by in-hospital personnel. Because, by training and inclination, obstetricians spend little time at the bedside—relying on nurses to provide care and support during labor—why not phase out the generalist altogether? A self-regulated midwifery profession, working in collaborative practice with consulting perinatologists, would appear to provide a better model for obstetric care.

In our "quick fix culture"[24] one should not expect the cesarean rate to drop without reeducating the public and the medical profession that most births proceed uneventfully without interference, and that many adverse outcomes can neither be anticipated nor prevented by cesarean section. Cultural change takes time; it also requires inspired leadership and grassroots support. In the meantime, let everyone practice the best obstetrics they know, and let the cesarean section rate seek its own level.

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