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Water Births: A Naked Emperor

ABBREVIATIONS. RCT, randomized, controlled trial; CI, 95% confidence interval.

In Hans Christian Andersen's sartorial tale of a vain emperor,[1] it takes a child's vision to bring clarity to an awkward situation. Despite knowing the naked truth, the people scold the child for speaking out and actively ignore the issues raised by his challenge. In a sense, water births, the birthing of an infant underwater, are much like the emperor's new clothes in that some people believe what they wish to serve their own purpose while actively ignoring the facts at hand and admonishing those who question their opinions. Despite an absence of supporting evidence, proponents of water births claim benefits and disregard concerns while continuing to fail to subject this approach to the rigors of scientific inquiry.

This desire to ignore the facts may be particularly prevalent among individuals who prefer nontraditional delivery techniques. In a 1989 editorial in the *Journal of Nurse-Midwifery*, Elder[2] compelled readers to put aside concerns about a lack of research and data, essentially to feel little need for this information when considering alternative practices, but instead to seek a "balanced perspective" against such "rigorous analysis." Elder wrote: "If one claims something is a fact, how should the claim be supported? Indeed, must it be supported?" She offered that nurse midwives, among the majority of proponents of alternative childbirth methods, should be "pioneers," taking pride in offering unproven alternatives. By advocating for this approach, she validated the long-recognized gap that separates practitioners of evidence-based medicine from practitioners who accept unproven alternatives as a basis for practice. In the current era of natural and alternative medicine, practices such as water births continue to be introduced without validation of their equality or superiority to standard obstetrical practice and despite some clear potential risks. In such a model, good alternative birthing practices cannot be differentiated from the bad. The resulting friction creates an "us versus them" childbirth environment that cannot serve the best interests of patients.

In a cautionary commentary, McGraw[3] noted that consumer demand for painless deliveries was originally responsible for the medicalization of childbirth. This process took labor and delivery from midwives in the home and brought it to the hospital under the guidance of physicians. He observed that nurse midwives returned to the practice of childbirth only as segments of popular sentiment decried this medicalization. Many nurse midwives (and some physicians) offer alternative practices, the proponents of which "have all too often made broad, sweeping, and unsupported claims." In the case of water births, claims are made for significantly decreasing the need for medical-surgical intervention, medications, episiotomy, and cesarean sections as well as offering a more natural and less traumatic birth experience for the infant. Water births are also offered to families who seek relief from the perceived loss of control during "medical" childbirth.[4–7] Daniels, an-oft cited nonclinician proponent of water births, noted that, "in the U.S., institutionalized medicine has virtually taken over childbirth. It has created a plethora of procedures for the convenience and benefit of doctors and hospital staff, rather than for the safety and comfort of the mother and baby."[7]

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This belief continues as a consistent theme underwriting alternative childbirth practices. Gilbert,[8] in her commentary on an article by Nyguen et al,[9] notes that "advocates of water birth cite empowerment and autonomy over birth as one of the main advantages but fail to give information about the potential harms of water birth." The co-author of a surveillance-and-survey study in the British Isles on water births (described below),[10] Gilbert agrees with the risk of serious adverse outcomes. She reminds us that women are most readily empowered when they are provided with the information that enables them to make the best possible decisions. The paucity of sound medical literature about water births suggests that proponents would rather not truly empower women with validated information but instead relegate the birth process to a more mystical experience. Not only is such an approach unsafe, but it demeans women who need clear information to make the best possible decisions for themselves and their child's future. Is there efficacy and safety in water birth at least equal to conventional birth? Is there objective information to support each claim? Does outcome vary by setting (ie, home water birth or hospital-based water birth)? Is water labor without water birth efficacious and safe? Is the safety of immersion the same as conventional births but with different problems? Women deciding on childbirth options and the clinicians who advise them cannot give sound informed consent without this information.

Primum non nocere (first, do no harm) is one of the basic tenets of modern medical practice. It arose from the understanding that the physician is compelled to demonstrate that the benefit of any medical approach outweighs the risk and that the practice is in fact beneficial to the patient. Careful scientific investigation and analysis are now the traditional means by which the physician learns where a particular practice lies on the risk-benefit spectrum. This approach is the fundamental concept of evidence-based medicine. If a procedure or medication has merit, that value can be readily demonstrated in a thoughtfully designed scientific study or review. In understanding the responsibility to determine benefit while reducing risk, physicians are continuously reassessing their practice standards. Any new approach to care is subjected to critical peer-reviewed evaluation in medical journals, conferences, and at the patient's bedside. Meritorious medications and techniques will stand up to scientific testing, randomized, controlled trials (RCTs) when applicable, whereas suboptimal approaches will be abandoned. In the absence of such evidence-based investigation, there can be no advances in medical practice, simply one person's opinions against another's. The resulting chaos would be a reversion to the early history of medicine, and the increased morbidity and mortality would be welcomed only by malpractice attorneys. RCTs derive their validity in part from the ethical hypothesis that one method is at least as safe and efficacious as another and that a patient randomized into one group or the other is not at increased risk of a poor outcome. The goal is to prove that, in fact, one method is more efficacious than another. Proponents of water birth should feel compelled to either undertake the challenge of designing and implementing a sound RCT or admit that such a randomization is unethical because the risk is actually greater in water births. As scientific practitioners, we must remain skeptical of untested regimens and beliefs at all times no matter what the anecdotal evidence suggests or how compelling the untested story is.[11,12] In this manner, we repeatedly challenge our medical practices to be certain that the emperor does indeed have clothes and, most importantly, to better serve our patients.

Unfortunately water births have received little such scrutiny. A current review of Medline-referenced articles reveals no substantial controlled research and certainly no well-designed RCTs of water birth. There have been a few studies, including RCTs, assessing water labor, but most of them are not well designed and offer contrary findings, providing little insight on the effects of water immersion on the infant.[13,14] Many studies mix water labor and water birth, confounding evaluation of these distinct practices. Nikodem[14] found only 3 acceptable trials in his Cochrane review, first completed in 1997 and updated in 1999 (the primary focus of these trials was immersion in labor, not necessarily birth underwater). All suffer from significant methodologic flaws, primarily performance bias. Rush et al[15] conducted the largest study of some 800 women (the other 2 studies together add $<$200 patients), 46% of the women in the immersion group did not use the tub but were still included in the intention-to-treat arm. Additionally, the authors included 41 noneligible women in the data analysis. Nikoderm's review determined that there were no statistically significant differences between immersion and nonimmersion in regards to pain relief, augmentation and duration of the first stage of labor, meconium-stained amniotic fluid, perineal trauma, or neonatal outcomes (Apgar score, umbilical arterial pH, and neonatal infection). He concluded that there was insufficient evidence from available RCTs to evaluate the use of the practice.

Many physicians view the practice as unproved and associated with significant, avoidable risks. In 1993, Zimmerman et al,[16] categorically challenged the claims of efficacy and safety of water births. Reviewing the literature for proposed benefits, they measured the safety and efficacy claims of proponents against physiologic and general considerations. Their review noted that experience and reason, let alone scientific evaluation, did not support the claims of water-birth proponents. Other authors have documented adverse neonatal outcomes including unexplained deaths, drowning and near-drowning, asphyxiation, water intoxication hyponatremia causing seizures, water aspiration leading to respiratory distress syndrome and respiratory failure, pulmonary edema, snapped umbilical cords, hypoxic-ischemic encephalopathy, pneumo-

nia, and other infections including *Pseudomonas* bacteremia.[8–10,17,18]

Gilbert and Tookey[10] provide us with an "outsider's" objective perspective on water births (they are epidemiologists). They provide us with the only broad epidemiologic information available, although their study suffers from the inherent flaws of a survey-based study. They undertook a difficult surveillance-and-survey study of water births in England and Wales occurring between April 1994 and April 1996 at 219 maternity units. Specifically, they evaluated the voluntarily reported outcomes of water birth and labor in water followed by out-of-water birth, comparing them with documented outcomes in conventional deliveries (not clearly defined but not in water). They received reports of 4032 such deliveries (0.6% of all deliveries) from 213 centers in 1995 (97% response) and 184 centers in 1996 (86% response).

Among these births were 5 perinatal deaths and 34 special care admissions in England and Wales after water birth that occurred within the first 48 hours of life. Perinatal mortality associated with water labor and/or birth was 1.2 per 1000 live births (95% confidence interval [CI]: 0.4-2.9), with 8.4 per 1000 live births (95% CI: 5.8-11.8) requiring admission to a special care nursery. In reports of low-risk, conventional deliveries in the United Kingdom during the same period, mortality was 0.8-4.6 per 1000 live births (95% CI: 0.2-4.2), with morbidity occurring in 9.2-64 per 1000 (95% CI: 58-70) live births. No deaths were attributed directly to water birth. Two infants were stillborn, 1 after a concealed pregnancy with no prenatal care lead to an unattended home birth (the authors do not indicate why this birth is included as a water birth). The 3 postpartum deaths were attributed to pathologic processes. One died within 3 days due to neonatal herpes, another expired at 30 minutes of life from intracranial hemorrhage after precipitous delivery, and the other died at 8 hours of life, later determined to be due to lung hypoplasia. Thirty-four infants were admitted to special care within 48 hours of birth, and 3 later died. Thirteen required respiratory support, and 15 survivors were diagnosed with pneumonia, transient tachypnea or "wet lung," suspected aspiration, meconium aspiration, water aspiration, and freshwater drowning (1 who had hyponatremia). Fifteen had other reasons for admission: 5 had snapped umbilical cords (1 requiring transfusion, 1 developing hypoxic ischemic encephalopathy grade 2, and 1 with a chromosomal abnormality), 3 had stridor, 1 had shoulder dystocia, 1 had hypoxic ischemic encephalopathy grade 3 and transposition of the great arteries, another had a chromosomal abnormality, and 4 had no clear reason or diagnosis. Although conventional birth is associated with many of the types of negative outcomes reported, it is evident that some are unique to water labor/birth.

Although concluding that the perinatal risk associated with water birth was not substantially higher than that of infants born conventionally, Gilbert and Tookey[10] reported several significant methodologic limitations of their study. Survey respondents over the 2-year course of the study declined significantly between the 2 study years (13.6%), with as much as 18% of the reports being based on estimates (presumably by responders) rather than documented numbers. The risks were calculated from small numbers with wide CIs. They were unable to clearly identify mothers who labored in but did not deliver in water. Underreporting of admissions to special care after delivery in water were suspected (although mortality numbers are felt to be accurate), there was inconsistent recording of birth circumstances, and specific risks and benefits were not being measured.

Gilbert and Tookey illuminated how difficult it is to assess the frequency of delivery by water birth and associated outcomes worldwide. There is no reporting requirement in the United States; many are home births, and many are water labors that are not followed by water birth. In the United States, there are increasing numbers of hospitals and home service agencies providing tubs and information on water labor and birth, but there is no central accrediting or regulating agency. The Joint Commission on Accreditation of Healthcare Organizations does not evaluate centers or keep specific information on the practice of water immersion or water birth (C. Hill, Joint Commission on Accreditation of Healthcare Organizations, verbal communication, 2004). Individual case reports of infant morbidity and mortality with water births appear increasingly in the medical literature, whereas the pleasant merits of water births without adverse incidents continue to be published as case reports and reviews in paramedical journals and Web sites.[3,8–10,13,17–19] These latter anecdotal case reports ostensibly validate the safety and efficacy of water births and are used as a basis for the claims of proponents, but they provide no objective details of the circumstances of those births, any long-term follow-up, or review of adverse outcomes across a population. Improved recording of water labor and water births and reliable, objective reporting of adverse events and outcomes could provide a more reliable understanding of safety and efficacy. Such a compulsory central registry could lead to a better foundation of knowledge from which studies and protocol consensus could be derived.

In light of this, it is not surprising that how one conducts, or who can conduct, a water birth has not been validly established. There is currently no consensus for conducting water labor or water birth (ie, water-quality assessments, temperature and maintenance, water depth or volume, fetal and maternal assessments, etc), and much disparity in opinion and practice exists.[6] Because proponents of water immersion have not addressed questions of safety and efficacy and have no central epidemiologic resource, they have not developed a foundation or consensus for the practice. Hence, a regulatory protocol or agency does not exist (nor, in the context of antimedicalization, can it). Given the incredible complexity of the childbirth process and the disparity in case re-

ports in the literature, a failure to develop a regulatory agency or consensus protocol suggests that critical assessment of this technique has not been appropriately forthcoming.

Water births currently provide no apparent benefit in childbirth. The practice is based on misrepresentations of neonatal physiology and unsupported claims of safety and efficacy. This birthing method fulfils no need for the infant, is of dubious benefit to the mother, is associated with significant, avoidable risks of morbidity and mortality, and currently is unable to pass the risk-benefit test. The continued push for water births in the absence of sound data to support claims undermines the credibility of the obstetric profession as it justifiably seeks to mitigate the necessary medicalization of childbirth. Water births should not be considered an acceptable standard of care until rigorous evaluation is pursued. Until that time, water births remain a naked emperor, whose nakedness must be challenged despite a culture of active ignoring that threatens to harm our patients and our profession.

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Head Start's National Reporting System: A Work in Progress

ABBREVIATION. NRS, National Reporting System.

Head Start is the nation's largest school-readiness program for young children considered at risk of poor academic outcomes. Since opening in 1965, the program has served >22 million children and their families. The majority of participants are 3- and 4-year-olds, and almost all live below the federal poverty level. Head Start delivers comprehensive services to meet the needs of the "whole child": physical and mental health, preschool education, social and emotional growth opportunities, social services for children and families, and parental and community involvement.

A research-and-evaluation component was part of the design of the program, making it a national laboratory for planning and testing a variety of early childhood services. Over the decades, thousands of studies on Head Start and other comprehensive programs have established that early intervention does boost school readiness, although investigations of long-term effects are relatively sparse.

Certainly a major deterrent to productive evaluation is the range of Head Start's objectives and the historical lack of appropriate assessment tools. The problem was addressed most recently by the Head Start Program Performance Measures Initiative.[1] Specific goals were identified in the areas of health, social and emotional development, cognition, and family involvement. Measures then were developed and field-tested in the Family and Children Experiences Survey.[2] The Advisory Committee on Head Start Research and Evaluation[3] built on this work in constructing a framework for studying the effects of Head Start. Their recommendations resulted in the Head Start National Impact Study, an ongoing longitudinal investigation of 5000 children using random assignment and a range of standardized measures.

At the center level, numerous evaluation procedures are required. The Program Information Reports are completed annually by each grantee and yield census and operations data. Programs are also required to collect data on children's progress and accomplishments along a range of developmental indicators. Called the Head Start Child Outcomes Framework, the purpose is program self-assessment and improvement. In the fall of 2003, the National Reporting System (NRS) was imposed. The system involves tests of vocabulary, letter recognition, and math skills administered to every kindergarten-

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