Immersion in Water During Labor and Delivery

ABSTRACT: Immersion in water has been suggested as a beneficial alternative for labor, or delivery, or both and over the past decades has gained popularity in many parts of the world. Immersion in water during the first stage of labor may be associated with decreased pain or use of anesthesia and decreased duration of labor. However, there is no evidence that immersion in water during the first stage of labor otherwise improves perinatal outcomes, and it should not prevent or inhibit other elements of care. The safety and efficacy of immersion in water during the second stage of labor have not been established, and immersion in water during the second stage of labor has not been associated with maternal or fetal benefit. Given these facts and case reports of rare but serious adverse effects in the newborn, the practice of immersion in the second stage of labor (underwater delivery) should be considered an experimental procedure that only should be performed within the context of an appropriately designed clinical trial with informed consent. Facilities that plan to offer immersion in the first stage of labor need to establish rigorous protocols for candidate selection, maintenance and cleaning of tubs and immersion pools, infection control procedures, monitoring of mothers and fetuses at appropriate intervals while immersed, and immediately and safely moving women out of the tubs if maternal or fetal concerns develop.

Evidence Regarding Immersion in Water During Labor and Delivery

Before examining available evidence concerning immersion during childbirth, it is important to recognize limitations of studies and evidence in this area. Most published literature that recommend underwater births are retrospective reviews of a single center experience, observational studies using historical controls, or personal opinions and testimonials, often in publications that are not peer reviewed (1–3, 9–11). Also of importance, there are no basic science studies in animals or humans to confirm the physiologic mechanisms proposed to underlie the reported benefits of underwater births.

Other issues, in addition to the nature and design of studies, complicate the interpretation of the published findings, including the absence of a uniform definition of the exposure itself. Often, immersion is referred to as “underwater birth,” but effects and outcomes may be different for immersion during the first stage and second stage of labor. This document, accordingly, avoids the
Immersion during labor is a method of delivery that involves placing the mother underwater, typically in a pool or bath, during childbirth. Advocates argue that immersion can provide a “gentler” transition from the in utero to ex utero environment (1–7). It could also potentially benefit the newborn infant as a result of these effects, proponents of underwater immersion during labor and delivery argue that there are a variety of benefits to such treatment, including a decrease in perinatal pain, a greater sense of well-being, and a decreased rate of perineal trauma. Some decrease in perinatal pain, a greater sense of well-being, and a decreased rate of perineal trauma. Some of the reported concerns include higher risk of maternal and neonatal infections, particularly with ruptured membranes; difficulties in neonatal thermoregulation; umbilical cord avulsion and umbilical cord rupture while the newborn infant is lifted or maneuvered through and from the underwater pool at delivery, which leads to serious hemorrhage and shock; respiratory distress and hyponatremia that results from tub-water aspiration (drowning or near drowning); and seizures and perinatal asphyxia (23).

Among the two trials that reported outcomes from immersion in the second stage of labor included in this systematic review (5), the only difference in maternal outcomes from immersion during the second stage was an improvement in satisfaction among those allocated to the immersion and control arms in the meta-analysis results.

Individual retrospective analyses and case series reports have noted complications for the mother and the neonate (17–25) that highlight potential risks from immersion during labor and delivery. Because the denominators are not uniformly reported, the exact incidence of complications is difficult to assess. Some of the reported concerns include higher risk of maternal and neonatal infections, particularly with ruptured membranes; difficulties in neonatal thermoregulation; umbilical cord avulsion and umbilical cord rupture while the newborn infant is lifted or maneuvered through and from the underwater pool at delivery, which leads to serious hemorrhage and shock; respiratory distress and hyponatremia that results from tub-water aspiration (drowning or near drowning); and seizures and perinatal asphyxia (23).

Among this list of complications, given its potential seriousness, the possibility of a neonate aspirating water during birth while immersed has been the focus of understandable concern. Alerdice et al (26) summarized case reports of adverse neonatal outcomes, including
drownings and near drownings. The case reports included immersion births in hospitals and at home. Subsequently, a study by Byard and Zuccollo reported four cases of severe respiratory distress in neonates after water birth, one of whom died of overwhelming sepsis from _Pseudomonas aeruginosa_ (19). Although it has been claimed that neonates delivered into the water do not breathe, gasp, or swallow water because of the protective “diving reflex,” studies in experimental animals and a vast body of literature from meconium aspiration syndrome demonstrate that, in compromised fetuses and neonates, the diving reflex is overridden (27, 28), which leads potentially to gasping and aspiration of the surrounding fluid.

Morbidity and mortality, including respiratory complications, suggested in case series were not seen in the 2009 Cochrane synthesis of RCTs, which concluded that, “there is no evidence of increased adverse effects to the fetus/neonate or woman from laboring in water or water birth” (5). This conclusion, however, should be tempered by several concerns, including the issue of the power of the sample size to identify rare but potentially serious outcomes. In this regard, in an RCT (29) excluded from the Cochrane analysis (because included labors all involved dystocia), 12% of neonates who were delivered in the immersion arm required admission to the neonatal intensive care unit, as compared with none in the group delivered without immersion.

**Summary**

Immersion in water during the first stage of labor may be appealing to some and may be associated with decreased pain or use of anesthesia and decreased duration of labor; however, there is no evidence that immersion in water during the first stage of labor otherwise improves perinatal outcomes. Immersion therapy during the first stage of labor should not prevent or inhibit other elements of care, including appropriate maternal and fetal monitoring.

In contrast, the safety and efficacy of immersion in water during the second stage of labor have not been established, and immersion in water during the second stage of labor has not been associated with maternal or fetal benefit. Given these facts and case reports of rare but serious adverse effects in the newborn, the practice of immersion in the second stage of labor (underwater delivery) should be considered an experimental procedure that only should be performed within the context of an appropriately designed clinical trial with informed consent.

Although not the focus of specific trials, facilities that plan to offer immersion in the first stage of labor need to establish rigorous protocols for candidate selection, maintenance and cleaning of tubs and immersion pools, infection control procedures, monitoring of mothers and fetuses at appropriate intervals while immersed, and protocols for moving women from tubs if urgent maternal or fetal concerns develop.

**References**


