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Water Birth – Benefits, Risks and Controversies

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Abstract

Introduction:

Water birth, involving immersion in water during childbirth, has gained popularity for its potential benefits, such as pain relief and comfort. While widely practiced in some countries, concerns regarding its safety, particularly for neonates, remain. This paper explores the maternal and fetal benefits and risks associated with water birth, as well as the epidemiological trends, medical protocols, and legal considerations.

Aim of Study:

The aim of this study is to evaluate the maternal and neonatal outcomes of water immersion and water birth, focusing on the safety, efficacy, and factors influencing its adoption in different populations.

Material and methods:

A comprehensive review of the literature on water birth including its benefits, risks and controversies was performed using the PubMed database.

Results and Conclusions:

Water immersion during labor is associated with significant maternal benefits, including reduced pain and anxiety, shorter labor, and fewer pharmacological interventions. Water birth, however, carries potential risks, such as neonatal respiratory complications and infections, although studies generally report no significant differences in neonatal outcomes compared to land birth. Epidemiological trends show higher water birth rates among women aged 30–39, while socioeconomic factors, such as deprivation, are linked to lower rates. Water birth has been shown to reduce the incidence of severe perineal tears and postpartum hemorrhage. While promising, the practice requires careful adherence to medical protocols to ensure safety, with further research needed to fully establish its long-term benefits and risks.

Keywords: water birth, pregnancy, newborn

1. Introduction

Water birth is widely practiced worldwide and is gaining increasing recognition in medical communities. The use of water, both cold and warm, during childbirth processes has a long history aimed at providing maternal relaxation and alleviating labor pain. The concept of water birth, initially a form of hydrotherapy, dates back to the 18th century. As early as in ancient Egypt, Rome, and Greece, physicians utilized water in medical practices (1). The first documented water birth took place in France in 1805. Physicians at the time reported a case of a woman whose labor lasted nearly 48 hours but concluded almost immediately after immersion in water. In the 1960s, a Russian gynecologist observed the positive effects of water births on neonatal health. In his work, he described experiences from 100 water births, highlighting reduced medical interventions and analgesic use during childbirth, while emphasizing the safety of this method (2). According to data by Rosales et al., between 1985 and 1999, approximately 150,000 water births were performed, indicating the growing popularity of this technique (3). In 1995, the first international conference on water birth took place in London, initiating

subsequent scientific events and conferences on a global scale. By 1993, water immersion during childbirth was accepted as a form of obstetric care in the United Kingdom. A key report on maternity care, entitled *Changing Childbirth*, recommended that every maternity unit should have access to a birthing pool (4). In 1994, the Royal College of Midwives and the Central Midwives Board in the UK recognized water immersion during childbirth as an integral part of midwifery practice. Today, the use of water during labor is an established component of the British obstetric system, included in the Nursing and Midwifery Council regulations and standards, as well as in the clinical guidelines developed by NICE (4).

By immersing their bodies in warm water, laboring women may experience reduced pain perception, lowered anxiety levels, and greater comfort and control over the childbirth process. The mechanism of this method relies on stimulating the secretion of endorphins and oxytocin, supporting the natural physiological processes of labor and reducing the need for pharmacological analgesia, including epidural anesthesia (5-7). The buoyancy of water facilitates the adoption of favorable birthing positions, such as squatting or kneeling, which reduce the risk of perineal tears and limit the necessity for medical interventions such as episiotomy or cesarean section (3). Furthermore, muscle relaxation and improved uterine perfusion may contribute to shortening the duration of the first and second stages of labor. Benefits for the neonate include better temperature regulation, reduced risk of hypoxia, and facilitated skin-to-skin contact immediately after birth (8).

Despite numerous advantages, water births require adherence to specific safety criteria. They are recommended only in cases of physiological pregnancies beyond the 37th week, without comorbidities and with normal cephalic presentation. Contraindications include high BMI, fetal growth restriction, infections, or antepartum hemorrhage. There remain uncertainties regarding the safety of immersion during the second stage of labor and potential risks to the neonate, such as infection or water aspiration (6, 7).

Although this method has garnered significant interest from laboring women, it also raises certain controversies. While the benefits for the mother are well-documented, issues concerning the neonate remain less conclusive. Concerns include potential risks such as infection, respiratory failure, water aspiration, hyponatremia, seizures, umbilical cord rupture, or even neonatal mortality. Additionally, water birth may influence the early bacterial colonization of the neonatal gut, affecting the development of the gut microbiota and potentially having long-term health implications (9).

The aim of this publication is to analyze the current state of knowledge regarding water immersion as a childbirth method, with a particular focus on medical and legal aspects associated with water birth.

2. The Difference Between Immersion and Water Birth

Water immersion during labor encompasses two related but distinctly different categories. Immersion refers to the use of a birthing pool to alleviate pain and enhance relaxation during the first, and occasionally part of the second, stage of labor, but the woman exits the pool before the delivery of the baby, which begins breathing in the air environment. In contrast, water birth involves the woman remaining in the pool throughout the entire process, including delivery, where the newborn emerges from the water and begins breathing on the surface (10).

3. Water Immersion During the First Stage of Labor

Available scientific evidence indicates that water immersion during the first stage of labor does not increase the risk of complications for the fetus or neonate. A Cochrane review from 2009 demonstrated the positive effects of hydrotherapy, such as buoyancy, hydrostatic pressure, and thermal changes, which support laboring women (11). Water buoyancy facilitates easier movement, supports neurohormonal labor mechanisms, and reduces pain perception. Additionally, hydrotherapy can enhance uterine perfusion, shorten labor duration, and reduce the need for medical interventions. Immersion in warm water up to shoulder height lowers blood pressure through vasodilation of peripheral vessels and blood redistribution. Despite limitations in evidence from randomized studies, authors suggest that water immersion during the first stage of labor significantly reduces the need for epidural/spinal analgesia and alleviates pain without adversely affecting labor duration, rates of operative interventions, or neonatal health.

The position of the Royal College of Obstetricians and Gynaecologists and the Royal College of Midwives from 2009 supports water immersion for healthy women with uncomplicated pregnancies, emphasizing the need to differentiate evidence related to immersion during active labor from that concerning water birth. Similarly, the American College of Obstetricians and Gynecologists' 2016 opinion states that water immersion during the first

stage of labor is safe for women with term, uncomplicated pregnancies. It may offer benefits such as reduced pain, less need for analgesia, and shorter labor duration (12).

A Cochrane review from 2018 provided evidence of moderate to low quality. It indicated that water immersion during the first stage of labor likely does not significantly affect the mode of delivery or the risk of perineal trauma but may reduce the use of regional analgesia (5).

4. Water Immersion During the Second Stage of Labor and Delivery

A joint statement by the Royal College of Obstetricians and Gynaecologists and the Royal College of Midwives from 2009 highlights that evidence on the benefits of water birth is less conclusive, although complications appear to be rare. The American College of Obstetricians and Gynecologists' 2016 opinion recommends avoiding water immersion during the second stage of labor and delivery due to insufficient scientific evidence and reports of several serious neonatal complications (12). The Cochrane review from 2018 found that evidence regarding water immersion during the second stage of labor is limited, and results showed no significant differences in maternal or neonatal health outcomes requiring intensive care. Additionally, there was no evidence of increased risks to the fetus or neonate during water birth (5).

A retrospective cohort study from 2019 by Hodgson et al. found that adverse neonatal outcomes were not higher in the water birth group. Moreover, a statistically shorter labor duration was observed in the water birth group, with no differences in the incidence of third- and fourth-degree perineal tears between groups (13). Another retrospective study published in 2020 by Sidebottom et al. reported no higher risk of neonatal hospitalizations in intensive or specialist care units for water births during the first or second stages of labor (14). Additionally, no significant differences were noted in secondary outcomes such as maternal infections, and women using water immersion during the second stage of labor had a lower risk of perineal tears.

5. ACOG Statement

The main critique by the American College of Obstetricians and Gynecologists (ACOG) is the lack of evidence derived from randomized clinical trials (12). However, conducting large, definitive randomized trials is unlikely. Firstly, women are often reluctant to participate in such studies, leading to small, highly selected samples (5, 15). Secondly, blinding in such studies is impossible. Thirdly, from an ethical perspective, it is not feasible to randomly assign participants to actual exposure to the subject of the study (waterbirth—ACOG does not oppose water immersion during labor but opposes underwater birth), as the study protocol must allow for clinical assessment and the decision to discontinue immersion in case of complications. This is scientifically problematic because the key variable is the actual exposure to waterbirth, not merely planning a waterbirth with the possibility of discontinuation in the event of complications (12). It is estimated that up to 70% of women planning waterbirths decide to or are asked to leave the water before delivery (15, 16).

Finally, the aforementioned intervention crossover would be unidirectional. Participants assigned to waterbirths may be asked to leave the water for better monitoring, but it is unlikely that women assigned to land births would begin immersion (17-19). This type of misclassification would bias analyses performed according to the intention-to-treat principle (9, 20). Consequently, observational data remain, which are inherently burdened by significant confounding factors. Analysis using propensity scores can minimize this effect by creating matched exposure and control groups, thereby reducing confounding by these variables (21). Matching with propensity scores produces less biased results than standard cohort analyses, and in the case of waterbirths, may yield results less biased than intention-to-treat analyses in randomized clinical trials (22).

A recently published small study using propensity scores compared waterbirths with land births, employing only four variables for matching and including fewer than 400 waterbirths (15). The aim of the study was to use propensity scores to create matched groups of waterbirths and land births in terms of dozens of potential confounding factors and to analyze maternal and neonatal health outcomes based on a large retrospective cohort ($N > 60,000$), in which a substantial portion of the sample consisted of waterbirths.

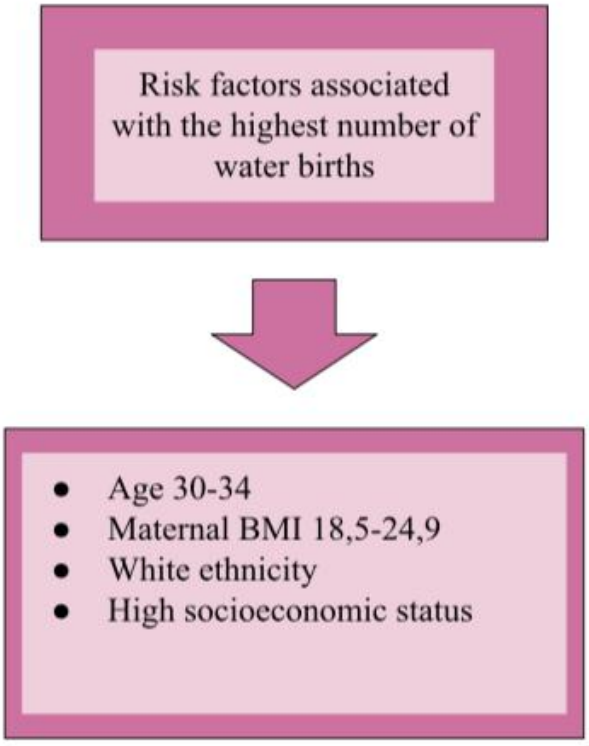
6. Epidemiology

A retrospective cohort analysis conducted by Aughey et al. included 46,088 spontaneous vaginal births among women at low and moderate risk, of which 6,264 were waterbirths. Among the study group, consisting of women without pre-existing comorbidities or obstetric risk factors, water births were more common among women aged

30–34 (15.9%) and 35–39 years (15.4%) compared to the 25–29 age group (12.9%). Conversely, the lowest prevalence of waterbirths was observed among women over 40 years of age (8.6%) and women aged 18–24 years, with only 10.4% delivering in water. Water Births were less common among obese women and multiparous women with three or more previous births.

The strongest associations were observed concerning ethnicity and socioeconomic deprivation. Asian and Black women were significantly less likely to opt for water births, at rates of 4.2% and 5.9%, respectively. Similarly, the frequency of water births decreased with increasing levels of social deprivation—women from the most deprived areas were half as likely to have waterbirths compared to residents of the wealthiest regions (23). Risk factors associated with the highest number of water births are illustrated in Figure 1.

Figure 1. Risk factors associated with the highest number of water births (23).



7. Maternal Benefits and Risks

Water birth offers many benefits for the mother but can also lead to various complications. In the study by Bashaikh et al., more than half of the women indicated that water birth alleviated labor pain, allowing them to adopt various comfortable positions that supported relaxation (24). These findings are consistent with other studies that have shown numerous advantages for the laboring woman, including the effectiveness of this non-pharmacological pain relief method, the creation of calm and relaxing birth conditions, and support for the progression of labor without invasive medical interventions (25, 26).

Other studies suggested that perinatal complications such as infections, perineal tears, neonatal intensive care unit admissions, and postpartum hemorrhages were less common with water births. The authors of the current analyses did not find significant differences between the groups regarding postpartum hemorrhage or severe perineal injuries. Furthermore, water birth was not associated with negative health outcomes for either the mother or the newborn (14).

Women participating in the study by Bashaikh et al. emphasized that water birth was not associated with an increased risk of infections, perineal tears, or excessive postpartum bleeding. Three-quarters of the participants also expressed the need for more detailed information about this method, and over a third declared a desire to give birth in water, with over a third of respondents wishing that water birth would become a common option

available to every woman giving birth (24). Similar results were obtained in Reyhan's study, where 39.5% of pregnant women expressed interest in water birth as a possible option, and other studies indicated that 38% of women planned it as their preferred method of delivery (27). These findings highlight the need to increase awareness about water birth as an alternative delivery method, particularly among Saudi women. Notably, nearly a third of participants expressed a preference for the presence of their spouse during a water birth, describing it as a positive experience that strengthens family bonds. The presence of the partner was seen as a factor fostering intimacy, community, and trust, which supported the creation of a supportive relationship during labor (28).

Additionally, the results of Bovbjerg et al. indicate that water birth may be associated with a significant reduction in the risk of postpartum hemorrhage >1000 mL and a lower frequency of overall postpartum bleeding (29). There were also fewer instances of maternal transfers from community care to hospitals and a lower percentage of hospitalizations in the first six weeks postpartum. An important result was also the reduced risk of third- and fourth-degree perineal tears and no increase in hospitalizations related to infections, as reported by previous authors. Despite a 25% relative increase in uterine infections among women giving birth in water, no increased number of hospitalizations was observed. The results suggest that many cases of infection had a mild course and could be treated on an outpatient basis. Snapp et al. reported a lower frequency of genital tract infections in women who gave birth in water (30), while Geissbuehler et al. observed reduced antibiotic use in the postpartum period (31). However, none of these studies accounted for potential confounding factors. On the other hand, Jacoby et al. observed an 80% reduction in the incidence of postpartum fever in the water birth group compared to standard deliveries (32).

The issue of birth canal injuries is also intensively studied in the context of water births. In the analysis, no differences were found between the groups. Literature results regarding water births, including at least 1000 cases, are varied, but our study, accounting for confounding factors, concludes that water birth does not clinically increase the risk of birth canal injuries (29, 33). Regarding more severe injuries (third- and fourth-degree), the results of studies are more consistent. All previous analyses suggest that water birth is not associated with a higher risk of such injuries or even reduces their likelihood.

8. Fetal Benefits and Risks

Water birth has raised numerous concerns regarding the safety of newborns born in water. Initial concerns focused on the risk of maternal fever due to immersion in water warmer than the natural body temperature, which could pose a potential threat to the fetus, as described by Deans et al. and Johnson et al. in the 1990s. As a result of these studies, recommendations were made to ensure that the water temperature in the pool does not exceed the woman's body temperature (34, 35).

Studies have shown an increased risk of umbilical cord detachment during water birth compared to land birth, but no increase in morbidity or mortality among newborns has been reported due to this (29).

There have also been reports of cases of severe infections caused by *Pseudomonas aeruginosa* and *Legionella pneumophila* (36, 37). It was suggested that fetal or neonatal infection could result from water contamination or contact with the mother's bacterial flora. However, numerous comparative and cohort studies did not confirm an increased risk of infection in the fetus or newborn associated with water birth. As with all obstetric procedures, the key task of medical personnel is to follow proper protocols for cleaning the birth pools and apply universal precautions to minimize the risk of infections (38).

Another concern is the risk of respiratory problems, including the possibility of drowning. A case of neonatal water aspiration was reported, accompanied by hyponatremia and seizures. It is presumed that the protective "diving reflex" may prevent breathing, inhaling, or swallowing fluid in newborns submerged in water. Studies have shown that in fetuses and newborns with impaired diving reflex, it may not function properly, which could lead to an attempt to take a breath and aspiration of water. Additionally, the existence of the diving reflex immediately after birth and the timing of its activation in healthy newborns have been questioned. Therefore, even properly developing fetuses may be at risk of water aspiration and its potential consequences (12).

Although there is a risk of rare but serious neonatal complications, available published data suggest that, in most cases, there are no significant differences in the incidence of neonatal outcomes between water birth and land birth (13, 30, 39).

9. Conclusions

Water birth, as a form of obstetric care, presents a valuable alternative for many women seeking a natural and less interventionist approach to childbirth. The research presented in this study highlights several maternal

benefits, including effective pain relief, reduced need for pharmacological interventions, and a more controlled labor experience. Additionally, water immersion may decrease the risk of certain birth-related complications, such as perineal tears and postpartum hemorrhage, and provides an opportunity for greater intimacy and support during labor. However, despite the promising maternal benefits, the neonatal risks associated with water birth cannot be overlooked. The main concerns revolve around the potential for respiratory complications, such as water aspiration, and the risk of infections, particularly if water is not properly maintained. While existing studies generally report no significant differences in neonatal outcomes between water and land births, the limited data on water birth during the second stage of labor warrants caution. From a medical standpoint, adherence to strict hygiene protocols and careful monitoring of maternal and fetal conditions is paramount to minimize risks. Legal frameworks surrounding water birth, especially regarding patient safety and informed consent, should be continuously updated to reflect new evidence and to ensure the practice is performed safely and responsibly. In conclusion, water birth offers an attractive option for women with uncomplicated pregnancies, but it must be approached with careful consideration of the risks and benefits. Further research is needed to clarify the long-term effects on both maternal and neonatal health and to establish universally accepted safety guidelines. The growing body of evidence suggests that, with proper medical oversight and appropriate patient selection, water birth can be a safe and beneficial method of delivery for many women.

Disclosure

Author's contribution

Conceptualization: [KN], [AK], [JG]
Methodology: [KN], [AK], [AŚ], [WN]
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