

Implementation of a Hydrotherapy Protocol to Improve Postpartum Pain Management

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Introduction: A growing number of women are seeking alternatives to traditional pharmacologic pain management during birth. While there has been an extensive array of nonpharmacologic options developed for labor, there are limited offerings in the postpartum period. The purpose of this quality improvement project was to implement a hydrotherapy protocol in the early postpartum period to improve pain management for women choosing a nonmedicated birth.

Process: The postpartum hydrotherapy protocol was initiated in a certified nurse-midwife (CNM) practice in an urban academic medical center. All women who met criteria were offered a 30-minute warm water immersion bath at one hour postpartum. Pain scores were assessed prior to the bath, at 15 minutes after onset, and again at the conclusion (30 minutes). Women who completed the bath were also asked to complete a brief survey on their experience with postpartum hydrotherapy.

Outcomes: In women who used the bath ($N = 45$), there was a significant reduction in pain scores ($P < .001$) between the onset of the bath and scores at both 15 minutes and 30 minutes. There was no significant difference between pain scores at 15 minutes and 30 minutes ($P = .97$). Of those women who completed a survey ($n = 43$), 97.7% reported both that the bath reduced their pain and improved their birth experience. One hundred percent reported they would use it again in another birth.

Discussion: This project demonstrated successful implementation of a hydrotherapy protocol as an alternative or adjunct to medication for early postpartum pain management that significantly reduced pain and improved the birth experience for those who used it. It offers a nonpharmacologic alternative where there have traditionally been limited options.

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INTRODUCTION

Giving birth is a multidimensional experience with physical, emotional, and psychosocial elements. For many, avoiding intervention and, in particular, pharmacologic pain management during the birthing process is pivotal to achieving their desired birth experience. While an estimated 61% of women in the United States use spinal or epidural anesthesia during childbirth,¹ many women seek nonpharmacologic pain management alternatives for labor, including continuous labor support, hydrotherapy, acupuncture, and hypnosis.² For those who achieve a medication-free birth, it is optimal to continue offering nonpharmacologic pain management postpartum, where pain continues from multiple sources: cramping from uterine involution, muscle soreness and fatigue from the work of labor, and perineal pain from birth.³ Unfortunately, there has been limited focus on nonpharmacologic postpartum pain management, and offerings are generally restricted to perineal ice packs, which provide only brief, localized relief. In women who do not desire medication, the lack of additional alternatives may result in unmanaged pain.

The most common pain management regimen following birth is a combination of oral medications, including ibuprofen, acetaminophen, and opioids. For those who are amenable to medication, there can be significant delays to administration and subsequent pain relief. Turnaround time

to pain relief from pharmacotherapy is dependent on computer provider order entry, pharmacy dispersal, and nursing administration. Studies have estimated order entry to pharmacy dispensing turnaround times to average more than 80 minutes⁴ and nursing administration turnaround times to average an additional 15 minutes.⁵ Additionally, ibuprofen and acetaminophen have onset times of greater than 20 minutes.⁶ These delays create a pain management gap for the first 2 hours postpartum. Untreated pain can have significant consequences for the mother-infant dyad including impaired bonding and breastfeeding initiation and a negative impact on the birth experience.⁷

The effectiveness of hydrotherapy for pain management has been well documented in the literature. Warm water immersion has been demonstrated to lower blood pressure and heart rate, reduce muscle tension, reduce anxiety, and relieve pain.^{8,9} Immersion hydrotherapy has been shown to reduce pain for a variety of conditions including muscle soreness, joint pain, arthritis,¹⁰ lower back pain,¹¹ and fibromyalgia.¹² Its safety and efficacy during childbirth are also well documented. Substantial data support a reduction in maternal pain and anxiety scores⁹ and a significant decrease in pain medication and regional anesthesia use.^{13–15} Immersion hydrotherapy also has the benefit of rapid onset, with a demonstrated decrease in maternal pain scores within 15 minutes of submersion.^{16,17} Literature on water birth, which provides hydrotherapy from labor through birth and into the early postpartum period, indicates that hydrotherapy does not increase the risk of infection or blood loss, even in the first hour postpartum where women are at high risk for hemorrhage.¹⁸

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Quick Points

- ◆ Nonpharmacologic pain management options are commonly offered for labor and birth but are limited in the postpartum period.
- ◆ Immersion hydrotherapy has been demonstrated to reduce the pain associated with birth.
- ◆ This quality improvement project implemented an immersion hydrotherapy protocol at one hour postpartum.
- ◆ Pain scores were significantly lower than pre-bath scores after 15 minutes in the bath and remained significantly lower at 30 minutes.
- ◆ Women self-reported that postpartum hydrotherapy improved their birth experience.

The midwifery model of care supports the normalcy of birth and aims to achieve healthy pregnancies and births with the least amount of intervention necessary to achieve safety.¹⁹ The primary aim of this quality improvement project was to implement a postpartum hydrotherapy protocol in a certified nurse-midwife (CNM) practice to improve pain management in the immediate postpartum period. A secondary aim was to evaluate satisfaction with postpartum hydrotherapy.

PROCESS

The project took place in an urban academic medical center that performs approximately 2700 births annually in a 12-bed labor and delivery unit. The hospital's CNM service offers a high-touch, low-tech model of care to women seeking low-intervention birth. Attending nearly 400 births in 2014, the service has an epidural analgesia rate of 17% and a cesarean birth rate of 10%, far below the national averages of 61% and 31.8%, respectively.^{1,20} Four of the labor and delivery rooms have tubs used for hydrotherapy. The hospital does not offer water birth.

The protocol was developed by a staff CNM, labor and delivery registered nurse (RN), and nurse manager, and was designed to implement postpartum hydrotherapy safely and effectively while avoiding disruption to routine unit work flow and patient throughput. It was reviewed by the hospital's perinatal council for safety, efficacy, and feasibility. The council is composed of the department's key stakeholders including representatives from maternal-fetal medicine, general obstetrics, nurse-midwifery, and nursing. The project was submitted to the institutional review board and deemed a quality improvement project, exempt from review. Once approved by the perinatal council, the protocol was then published in the hospital's policies and procedures online manual, and staff were oriented at monthly staff meetings (see appendix).

All women giving birth with the CNM service were considered eligible for postpartum hydrotherapy. In the first hour after birth, fundal tone, bleeding pattern, laceration severity, and vital signs were assessed in routine fashion and used to determine eligibility for use of postpartum hydrotherapy. Maternal conditions and contraindications that prevented use of hydrotherapy are listed in the protocol in the appendix. If a woman met criteria and there were no other barriers to use, such as inadequate staffing, she was offered the bath. If

accepted, the bath was initiated at one hour postpartum. Ibuprofen administration upon maternal request was not restricted prior to the bath.

The tub was filled with warm, 37°C to 38°C water, as measured by an attached thermometer. Immediately prior to the bath, maternal vital signs were obtained, as well as a pain score using the Numeric Rating Scale (NRS-11). The scale is a self-assessed rating of pain intensity on a scale from 0 to 10 that is evidence-based and widely used due to ease of use, patient comprehension, and standardized format.²¹ The woman was then assisted out of bed and into the tub where she remained for 30 minutes. For safety purposes, a licensed provider (CNM or RN) remained with her throughout the bath to assess for any change in status including nausea or dizziness, increased bleeding, presyncopal symptoms, or maternal request to exit the tub. During the bath, the newborn underwent an initial nursing and pediatric assessment or remained skin-to-skin with the woman's partner. After 15 minutes in the bath, pain was assessed again. At 30 minutes, pain was reassessed for a third time, and then the woman was assisted out of the tub and back to bed. Afterward, she was asked to complete the satisfaction survey.

Outcome measures were collected for 4 months following implementation. Outcome measures included how frequently women were eligible for postpartum hydrotherapy, how often it was used, pain scores, satisfaction survey results, and safety issues. A data collection tool, filled out by the attending CNM or the patient's RN, gathered information to evaluate overall usage, barriers to use, frequency of exclusion criteria, and safety issues. Satisfaction with postpartum hydrotherapy was measured using a 3-question survey of "yes" or "no" questions. The 3 questions asked were: 1) Did using the bath after birth improve your pain? 2) Did using the bath after birth improve your birth experience? and 3) If you have another child, would you use the bath again after birth?

Data were assessed using IBM SPSS (IBM Corporation, Armonk, NY). Frequencies and cross tabulation characterized categorical data. An analysis of variance of repeated measures was used to evaluate pain scores at the 3 time points: prior to, at 15 minutes into the bath, and at the end of the 30-minute bathing period. Cases where pain scores were missing were excluded from analysis. A level of .05 was used for tests of significance. Information including identification of exclusion criteria and reasons for not offering postpartum hydrotherapy were coded so that frequencies could be reported.

Time	Estimated	Mean Difference	P
	Mean ^b	From Start	
Pre-Bath	3.02 ^b		
15 min	1.63 ^b	-1.395	< .001
30 min	1.54 ^b	-1.488	< .001

^aSelf-reported scores using the Numeric Rating Scale, where 0 equals no pain and 10 equals the worst possible pain.

^bGreenhouse-Geisser correction used due to violation of assumption of sphericity.

Safety was assessed using a simple content analysis of reported issues.

OUTCOMES

Eighty-four women gave birth with the CNM service during the data collection period. Of the women who gave birth during this period, 77.3% met criteria for postpartum hydrotherapy (n = 65). Reasons women did not meet criteria included regional anesthesia or narcotic analgesia use or cesarean birth. Of those who met criteria, 81.5% were offered the intervention (n = 53). From those who were offered, 84.9% used postpartum hydrotherapy (n = 45). When women were eligible for postpartum hydrotherapy and they did not use it, CNMs were asked to document the reason. Midwife choice, tub unavailability, and staffing were the primary reasons that hydrotherapy was not offered despite women meeting criteria.

Pain Management

A summary of pain scores at the 3 time intervals is reported in Table 1. While initial pain scores were low (estimated mean score of 3.02), pain scores were significantly lower at 15 minutes ($P < .001$) and at 30 minutes ($P < .001$) when compared to prior to the bath. There was no significant difference between pain scores at 15 minutes and 30 minutes ($P = .969$). Ten women (22%) requested ibuprofen, which was administered immediately before entering the tub.

Satisfaction With Postpartum Hydrotherapy

Women who used postpartum hydrotherapy were asked to complete a questionnaire to assess satisfaction. Of those women, 95.6% completed the survey (n = 43). Of the women surveyed, 97.7% responded that the bath reduced their pain, and 97.7% reported that it improved their birth experience. One hundred percent of respondents reported that if they gave birth again, they would use postpartum hydrotherapy again.

Safety

CNMs were also asked to report any safety issues. Three safety concerns were reported. One woman became dizzy upon standing and was assisted back to bed before participating in postpartum hydrotherapy. Another reported nausea and dizziness during the bath, which resolved with oral hydration and food intake. Finally, a woman with a previous history of anxiety became anxious in the tub, began to hyperventilate, and became dizzy but unwilling to exit the tub. Water was

drained and the woman was reclined in the tub, where she remained until her symptoms improved and she could be safely assisted back to bed. No patient harm occurred with any woman using the tub. There were no reports of increased bleeding with hydrotherapy use.

DISCUSSION

Childbirth is a life-changing experience marked by intense physical pain for most women. Supporting the normalcy of birth and a woman's desire to birth without intervention are cornerstones of midwifery care.²² Eighty-five percent of qualifying women took advantage of postpartum hydrotherapy. This high rate of utilization demonstrates how often there is opportunity to promote low-intervention alternatives, even postpartum.

While mean pain scores were low, 97.7% of women reported that the bath reduced their pain. The women who used postpartum hydrotherapy also reported improvement in their birth experience. Unfavorable birth experiences can increase the risk for postpartum depression, disrupt mother-infant bonding, and negatively influence expectations for future pregnancies.²³ Previous research supports a link between higher birth satisfaction and nonpharmacologic pain management options as well as achieving a pain medication-free birth.^{24,25} There have also been studies linking increased birth satisfaction in patients who feel that their expectations were met.²⁶ Postpartum hydrotherapy demonstrates the opportunity to carry nonpharmacologic care into the postpartum period and enhance overall birth satisfaction. These results validated the value of postpartum hydrotherapy and have contributed to the continued use of postpartum hydrotherapy in our institution.

Barriers to postpartum hydrotherapy included limited tub availability and staffing issues, which were cited in 20% of eligible cases. The facility had tubs in only 4 of the 12 labor rooms, resulting in 17.2% of qualified women giving birth in a room with no tub. Staffing was also noted to be a barrier. The CNM elected not to offer hydrotherapy for 17.2% of qualified women and indicated staffing issues in 3.4% of births. While it is not entirely clear why CNMs chose not to offer it, the requirement of remaining with the patient was likely a factor. The Association of Women's Health, Obstetric and Neonatal Nurses professional RN staffing guidelines recommend one RN for each postpartum woman in the first 2 hours after birth²⁷; however, this is not always the case in practice. Using these staffing guidelines would better ensure the availability of postpartum hydrotherapy as a pain management option as an RN would be there to assist the woman with her bath.

Finally, postpartum hydrotherapy was successfully implemented with limited identification of immediate safety concerns. Dizziness and lightheadedness were reported 4% of the time, and there were no reports of increased bleeding with its use. This validates the need for appropriate staffing so that a licensed provider can remain with the woman throughout her time in the bath. After use, the tubs were cleaned thoroughly in the routine fashion with the appropriate surface cleaner approved by the hospital's infection control officer.

Limitations

As a quality improvement project, the focus was on achieving implementation and utilization of the intervention. Future research is warranted to evaluate hydrotherapy's effectiveness compared to traditional postpartum pain management, as well as short- and long-term studies of safety measures. Given the desire to focus on satisfaction with postpartum hydrotherapy specifically, the evaluation of satisfaction was performed with nonvalidated measures. Future studies may want to compare overall birth satisfaction with and without postpartum hydrotherapy with a previously validated patient satisfaction tool.

CLINICAL IMPLICATIONS

The project demonstrated the successful implementation of an alternative pain management tool in an area where clinicians are lacking an array of nonpharmacologic options. The protocol is feasible in other settings where tubs are readily available in the birthing rooms. Success and sustainability rely on a staffing model that allows for someone to remain with the patient in the early postpartum recovery period. Implementation of a hydrotherapy protocol in the postpartum period offers the opportunity for practitioners to offer nonpharmacologic pain management options through the entire birth experience.

CONCLUSION

Support of low-intervention birth and alternatives to pharmacology are hallmarks of midwifery care. Immersion hydrotherapy offers the opportunity for nonpharmacologic pain management in the postpartum period.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to report.

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Appendix: Postpartum Hydrotherapy Protocol^a

Scope

Women desiring hydrotherapy in the immediate postpartum period as a source of pain management

Purpose

Safe use of hydrotherapy in the immediate postpartum period

Who Performs

Nurse-midwives and women's health nursing staff

When to Perform

Immediate postpartum period on labor and delivery

Exclusion criteria for postpartum hydrotherapy

Infectious process including chorioamnionitis, maternal fever greater than or equal to 38°C, or open skin lesions

Recent use of narcotic analgesia, regional anesthesia, or nitrous oxide that continues to impair movement or level of consciousness

Postpartum hemorrhage with estimated blood loss greater than 500 mL

Physical limitations that interfere with a woman's ability to enter or exit the tub

Procedures

Postpartum hydrotherapy may be initiated one hour after birth.

A licensed staff member will remain with the woman at all times during postpartum hydrotherapy.

Water temperature is not to exceed 37.9°C (100°F).

Vital signs should be taken prior to assisting the woman out of bed. Maternal assessment continues per hospital routine during hydrotherapy.

If maternal assessment and pulse remain unchanged in the tub, a blood pressure may be deferred.

Assist the woman into a comfortable position in the tub.

The woman may remain in the tub for 30 minutes and then is assisted out of the tub and back to bed.

At any time maternal assessment is found to be outside the acceptable range, the woman will be assisted out of the tub and appropriate care provided.

Personal protective equipment, including shoulder length gloves and goggles, will be used at all times when assisting with postpartum hydrotherapy.

^aPostpartum hydrotherapy protocol at Virginia Commonwealth University.