Hydrotherapy as a Nursing Intervention for Labour Pain: A literature review

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Abstract

This literature review provides a brief history of hydrotherapy during labour, a summary of the existing literature, and implications for practice. The objective of the literature review is to explore the evidence regarding the safety and efficacy of hydrotherapy as a method to alleviate labour pain during the first stage of labour. A comprehensive review of the literature was conducted in August 2016 using CINAHL, ProQuest, and MedLine databases. Keywords used were: hydrotherapy, water immersion, intrapartum, labour and/or nurse with truncation and Boolean methods. The inclusion criteria for the search were: articles available in English, accessible electronically, peer-reviewed, and with year restrictions of 2005-2016. The search yielded one practice guideline, four recommendations from regulatory colleges, three systematic reviews, and five single studies. The author concludes that hydrotherapy for low risk parturients is a safe and effective method of pain control that empowers nurses and promotes positive patient outcomes.

Keywords: barriers, hydrotherapy, labour, nurse, nursing, perinatal, pain

Résumé

Cette analyse documentaire fournit une brève histoire de l'hydrothérapie pendant l'accouchement, un résumé de la documentation existante, et les implications sur la pratique. L'objectif est d'explorer les preuves concernant l'innocuité et l'efficacité de l'hydrothérapie comme méthode pour soulager les douleurs pendant la première phase de l'accouchement. Un examen exhaustif de la documentation a été effectué en août 2016 à l'aide des bases de données CINAHL, ProQuest et MedLine. Les mots-clés utilisés sont: l’hydrothérapie, l’immersion dans l’eau, intrapartum, l’accouchement et / ou l’infirmière avec troncation et les méthodes booléennes. Les critères d'inclusion pour la recherche étaient les suivants: les articles disponibles en anglais, accessibles par voie électronique, évalués par des pairs et avec des restrictions des années 2005 à 2016. La recherche a fourni une guide de pratique, quatre recommandations des collèges de réglementation, trois revues systématiques et cinq études individuelles. L'auteur conclut que l'hydrothérapie pour les parturientes à faible risque est une méthode sûre et efficace de contrôle de la douleur qui autorise les infirmières et favorise des résultats positifs pour les patients.

Mots clés : Barrières, hydrothérapie, accoucher, infirmière, soins infirmiers, périnatal, douleur
Introduction

Labour pain is unique in that it is of limited duration and part of a normal physiological process where the pain is a result of both somatic and visceral phenomena (Gibson, 2014). Many women continue to choose to give birth in hospitals; therefore, nursing care that supports effective pain management is vital to the success of the birthing experience. During labour women value factors such as “individual attention from caregivers; caring, competent caregivers; communication; information; advocacy; pain relief and physical comfort; emotional support; and personal control” (Bergstrom, Richards, Morse, & Roberts, 2010, p. 38). Registered Nurses (RNs) working Labour and Delivery must ensure they are offering diverse and beneficial pain management options during the duration of labour. Hydrotherapy during the first stage of labour is an evidence-based practice that should be promoted and implemented to support women who labour in hospitals as it empowers nurses and is beneficial to the woman and neonate (Cluett & Burns, 2012).

Today, hydrotherapy is an overarching term that encompasses warm water immersion in tubs and whirlpools as well as the application of warm water in showers. It is important to distinguish between hydrotherapy during labour and water births as historically, the practice may have involved both. For the purposes of this review, hydrotherapy is an intervention applied during the first stage of labour using a tub or shower. This literature review only focuses on hydrotherapy as a nursing intervention as water births are not within the nursing scope of practice (Regulated Health Professions Act, 1991).

Parturients depend on nurse and physician interventions and midwives, where they are available, to manage pain during labour, but the management of pain is often pharmacologic (Rooks, 2012). Neuraxial analgesia (epidural analgesia) is highly effective but has many negative effects on the labour process (Rooks, 2012). However; RNs are able to implement some non-pharmacologic interventions during labour such as hydrotherapy, positional changes, and pressure application. It is important to note that many colleges and hospitals may employ strict guidance on contraindications to hydrotherapy such as: oxytocin induction, vaginal births after Cesarean section, and other high risk medical conditions. This literature review will explore the research on the safety and efficacy of hydrotherapy use in hospitals during the first stage of labour as a nursing intervention.

History of Hydrotherapy in Labour

Hydrotherapy has been used since ancient times by the Greeks, Romans, Chinese and other civilizations for holistic health (Reid-Campion, 1997, as cited in Cluett and Burns, 2012). However, the origin of hydrotherapy during labour is not well-documented. It appears in the literature sporadically beginning in 1805, where the first water birth occurred in France (Embry, 1805 as cited in Weaver, 2014). In 1980, a water birth was recorded in the United States but it is not known when the practice extended to Canada (Weaver, 2014).

During the 1970s, two men revitalized European interest in hydrotherapy: a Russian boat builder who initiated a surge of popularity to promote water birth as he strongly believed in the physiological benefits and researcher Michael Odent, who popularized water immersion in other European countries (Weaver, 2014). In the mid-1990s, the first international water birth conference was held in London, bringing focus to research on warm water immersion during labour worldwide.
The body of evidence on the effects of hydrotherapy on labour pain is slowly growing, although limited. Acceptance of the practice of hydrotherapy varies between countries and regulatory colleges. Citing research limitations as a main constraint, many researchers and practitioners support hydrotherapy during labour, but not water births, which means women are advised to get out of the water to deliver (American College of Obstetricians & Gynecologists [ACOG], 2016; Cluett & Burns, 2012; National Institute for Health & Care Excellence [NICE], 2016).

**Methods**

The research question informing this literature review is: Is hydrotherapy a safe and efficacious method to alleviate labour pain during the first stage of labour? A comprehensive review of the literature was conducted in August 2016 using CINAHL, ProQuest, and MedLine databases. Keywords used were: hydrotherapy, water immersion, intrapartum, labour and/or nurse with truncation and Boolean operators. The inclusion criteria for the search were: articles available in English, accessible electronically, peer-reviewed, and with year restrictions of 2005-2016. The search yielded one practice guideline, four recommendations from regulatory colleges, three systematic reviews (Table 1), and five single studies (Table 2).

**Findings**

**Regulatory Colleges Support the Use of Hydrotherapy**

Several regulatory colleges support the use of hydrotherapy during labour; however, no practice recommendations for Canadian nurses were found nor is the prevalence of hydrotherapy use known across Canada. The American College of Obstetricians and Gynecologists (ACOG) released a committee opinion outlining practice recommendations with a corresponding evidence synthesis on water immersion during labour in November 2016. The committee concluded that water immersion during the first stage of labour may be associated with shorter labour and decreased use of spinal and epidural analgesia. The committee recommended that physicians offer hydrotherapy to healthy women with uncomplicated pregnancies between 37 and 42 weeks of gestation. The committee also recognized the effort required to implement hydrotherapy and further recommended that facilities establish rigorous protocols for maintenance, sanitation, and patient eligibility. Moreover, it was recommended that the appropriate equipment be available to monitor maternal and fetal status and that the women are able to easily get out of the water to deliver should complications develop (ACOG, 2016).

The College of Midwives of British Columbia (CMBC) (2015) recommends hydrotherapy during labour for low risk parturients (more than 37 weeks gestation, active labour, and normal fetal heart rate). The College suggests that midwives should have an alternate to water birth in case of complications and outlines very strict guidelines for contraindications, such as the use of opioids within four hours of entering the birthing pool. The College of Midwives of British Columbia (2015) supports their recommendations with much of the evidence found in the literature cited in this review.

The Royal College of Midwives’ (RCM) Evidence-Based Guidelines (2014) acknowledges that water immersion during labour is effective and decreases the use of epidural/spinal analgesia during labour. RCM supports midwifery training in the use of water for labour pain control and the need for supportive protocols and policies. Similar to the ACOG, the
RCM reinforces the importance of ensuring water quality, maintaining an appropriate temperature, adequate sanitation, and close monitoring of maternal and fetal status. (RCM, 2014)

The American College of Nurse-Midwives (ACNM) (2014) supports the use of hydrotherapy during labour as being a safe and effective non-pharmacological pain management strategy. Women should also have access to information on hydrotherapy so as to make an informed decision about their pain management strategies. The ACNM states that nurse-midwives should provide women with the opportunity to remain immersed during labour and birth with ongoing maternal/fetal assessment. Lastly, the ACNM recommends that facilities should not prevent maternal care providers from providing hydrotherapy and that all low-risk women should be allowed a choice to utilize hydrotherapy during labour. (ACNM, 2014)

Safety and Benefits of Hydrotherapy

Included in the clinical practice guideline Intrapartum Care for Healthy Women and Babies from the National Institute for Health and Care Excellence (NICE) (2016) are recommendations for water immersion during labour. The recommendations are succinct: offer women the opportunity to labour in water for pain relief; monitor the temperature of the woman and the water hourly; and, keep baths and pools clean using appropriate sanitary mechanisms. NICE (2016) also supports aforementioned statements regarding the contraindication of women under the influence of opioid therapy using the tubs. (NICE, 2016)

Jones et al. (2013) completed a systematic review of 18 systematic reviews (15 being Cochrane reviews). The objective was to summarize the evidence from systematic reviews on the efficacy and safety of non-pharmacological and pharmacological interventions to manage pain in labour. The authors suggest more research is needed on outcome factors, but conclude that water immersion is an effective and safe method of pain management with no adverse effects for the mother or neonate and improves maternal satisfaction and sense of control (also known as labour agency). Furthermore, it is suggested that the fetus may benefit from hydrotherapy as maternal relaxation catalyzed by warm water immersion optimizes placental perfusion and the ease of mobility during water immersion also optimizes fetal position. Jones et al. (2013) posit that water immersion may also be associated with improved uterine perfusion, less painful contractions, and a shorter labour with fewer interventions. Furthermore, when women are shoulder-deep, the water immersion may reduce blood pressure due to the vasodilation of peripheral vessels.

Cluett and Burns (2012) conducted a systematic review of randomized controlled trials examining immersion in water during labour and water birth on maternal, fetal, neonatal, and caregiver outcomes. The synthesis included 12 randomized control trials (n=3243 women). The authors concluded that although further research is needed, evidence suggests that water immersion during the first stage of labour reduces the use of epidural/spinal analgesia and duration of the first stage of labour. There is no evidence of increased adverse effects to the fetus or woman from labouring in water (Cluett & Burns, 2012). The authors found that during the first stage of labour, there was a significant reduction in the anaesthesia rate (epidural, spinal, paracervical) among women who opted for water immersion (RR=0.9, CI=95%). There was also a reduction in the duration of the first stage of labour amounting to approximately 33 minutes (95% CI, Range -58.7 – -6.13). The authors also found an increased level of satisfaction with the birth experience (RR=0.24; 95% CI). There was no statistically significant difference in assisted vaginal deliveries, caesarean sections, perineal trauma, maternal infection, neonatal infection, neonatal intensive care unit admissions, or use of oxytocin induction. The authors iterated the need for further research.
Vargens, Silva, and Progianti (2013) completed a systematic literature review of 21 studies relating to non-invasive interventions during labour with a nurse-midwife focus. The authors Vargens et al. (2013) incorporated an ecological framework into their synthesis, stipulating that labour is a natural and physiological phenomenon that requires care rather than treatment or control. During the data extraction phase, no quality assessment was made on the included articles, increasing the risk of potential bias. Based on the ecological framework incorporated, the authors concluded that hydrotherapy during labour is a safe practice that yields benefits including physiological well-being and increased relaxation and comfort during labour. The authors also found that showering reduced painful sensations. Furthermore, warm water was shown to aid women with arrested dilation and the associated pain that occurs with labour dystocia. The benefits of weightlessness are supported as well as the affect that water heat has on increasing the secretion of adrenaline. In the conclusion the authors reiterate that the best interventions during labour are those that are decided upon by the woman and the birth attendant(s) (Vargens et al., 2013).

### Table 1 Characteristics of Systematic Reviews

<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Methods</th>
<th>Participants (n)</th>
<th>Objective</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluett &amp; Burns (2012)</td>
<td>Systematic Review</td>
<td>12 RCTs (n=3243)</td>
<td>Effects of immersion in water during labour and water birth on maternal, fetal, neonatal, and caregiver outcomes.</td>
<td>Water immersion during the first stage of labour reduces the need for epidural analgesia and increases maternal satisfaction. There is no evidence of increased adverse effects to the fetus/neonate or woman from labour in water or water birth.</td>
</tr>
<tr>
<td>Jones et al. (2013)</td>
<td>Systematic Review</td>
<td>18 RCTs (n=3252)</td>
<td>Efficacy and safety of non-pharmacological and pharmacological interventions to manage pain in labour</td>
<td>Water immersion is an effective and safe method of pain management. Hydrotherapy may improve maternal satisfaction and placental and uterine perfusion. It may also be associated with shorter labour with fewer interventions.</td>
</tr>
<tr>
<td>Vargens, Silva, &amp; Progianti (2013)</td>
<td>Systematic literature review</td>
<td>21 articles with ranging methodologies</td>
<td>Efficacy and use of non-invasive interventions during labour with a nurse-midwife focus.</td>
<td>Hydrotherapy during labour and showering appears to reduce painful sensations. No quality assessment was noted during the data extraction phase.</td>
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</tbody>
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### Table 2 Characteristics of Single Studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Methods</th>
<th>Participants (n)</th>
<th>Objective</th>
<th>Findings</th>
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<tbody>
<tr>
<td>Lukasse (2014)</td>
<td>Prospective cohort study</td>
<td>n=16577</td>
<td>To assess whether immersion in water for pain relief in labour is associated with a lower risk of intrapartum transfer and other intrapartum interventions and adverse maternal outcomes in low risk nulliparous women planning birth outside an obstetric unit.</td>
<td>Hydrotherapy associated with less birthing interventions, less transfer of care to a physician, and increased chance of a vaginal birth.</td>
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<tr>
<td>Liu et al. (2014)</td>
<td>Case-control</td>
<td>n=108</td>
<td>To compare the maternal and neonatal outcomes of women who underwent water immersion during the first stage of labor with those who underwent conventional labor and delivery.</td>
<td>Pain scores were significantly greater in the control group ($p=0.001$). There were no differences in Apgar scores or rates of infection.</td>
</tr>
<tr>
<td>Lee, Liu, Lu, &amp; Gau (2013)</td>
<td>Randomized Control Trial</td>
<td>n=39</td>
<td>To examine pain scores between women who received warm showers at 4cm dilation and those who received standard care.</td>
<td>Pain scores were significantly lower in the experimental group ($p&lt;0.001$).</td>
</tr>
<tr>
<td>McKenna &amp; Symon (2014)</td>
<td>Interpretive phenomenological study</td>
<td>n=10</td>
<td>To understand the experiences of women undergoing Water VBAC, and what motivates them to seek hydrotherapy.</td>
<td>Major themes identified with the constant comparative method were: improved maternal outcomes, high satisfaction, heightened labour argentry, and improved pain relief and</td>
</tr>
<tr>
<td>Author (Year)</td>
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<td>Stark (2013)</td>
<td>Pretest-posttest single group design</td>
<td>n=24</td>
<td>Deepen understanding of the maternal/fetal effects of showering during labour.</td>
<td>There were significant differences in tension, anxiety, and fetal heart rate.</td>
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Lukasse, Rowe, Townend, Knight, and Hollowell (2014) conducted a prospective cohort study between April of 2008 and 2011 in the United Kingdom. Researchers accessed the charts of women (n=16577) who had given birth and used hydrotherapy for pain management in midwifery units. Hydrotherapy was common, occurring between 38-54% in the facilities studied. The researchers found that water immersion during labour was associated with a lower risk of transfer of care to a physician before birth for births planned at home (RR 0.88; 95%CI 0.79-0.99), in freestanding midwifery units (RR 0.59; 95% CI 0.50–0.70), and in acute care obstetrical units (RR 0.78; 95% CI 0.69–0.88). The researchers also found that hydrotherapy was associated with a higher chance of vaginal birth (RR 1.09; 95% CI 1.04–1.15) and an overall reduction in birthing interventions in freestanding midwifery clinics (RR 0.61, 95% CI 0.48–0.77) (Lukasse et al., 2014).

Liu et al. (2014) conducted a case-control study of women in labour (n=108) in China. Thirty-eight participants received water immersion and 70 received standard care but did not opt for hydrotherapy. There were no differences in maternal height, weight, age, gestational age, gravidity or newborn weight between the groups (p=0.05). Using the visual analogue scale (VAS), the researchers found that water immersion during labour reduced labour pain and is associated with a lower rate of cesarean delivery (p=0.02). VAS scores were significantly greater in the conventional labour group at 30 and 60 minutes after a cervical dilation of 3 cm (p=0.001). There were no differences in Apgar scores between the groups nor were there differences in rates of infection. Water immersion does not appear to increase the rate of maternal or neonatal infections and is associated with a lower rate of stress urinary incontinence 42 days postpartum (p=0.03), a variable not mentioned in earlier studies. (Liu et al., 2014)

A randomized control trial studying the efficacy of hydrotherapy took place in Taipei in a study conducted by Lee, Liu, Lu, and Gau (2013). The study examined the effect of 20-minute warm showers on parturients (n=39) able to control the direction of water flow at a controlled temperature during the first active phase of labour (control group [n=41] received standard care). Demographic and obstetric information was collected and only multiparous women could participate. Participants rated pain on a visual analogue scale before and after the warm shower at 4cm dilation and women in the experimental group responded to the visual analogue scale at ten and twenty minutes after 4cm dilation while receiving standard care. Women reported lower pain scores during and after the twenty-minute shower (p= <0.001). The research supports the use of warm showers during labour as an effective non-pharmacologic pain management intervention (Lee et al., 2013).

An interpretive phenomenological study (McKenna & Symon, 2014) was conducted in the United Kingdom between 2008 and 2011 on women (n=10) who had a water Vaginal Birth After Caesarean (VBAC). Semi-structured interviews were conducted in the spring of 2012 regarding reasons for water VBAC, sources of information that influenced their decisions, and
the support they received. The interviews were recorded and played back to each participant at the end. Major themes were identified using the constant comparative method and inconsistencies and contradictions were examined to allow for the evolution of sophisticated themes. The women reported improved maternal outcomes, high satisfaction, heightened labour agentry, improved comfort and better pain relief. The women also reported improved postnatal outcomes. The authors postulated that maximising control and positioning the woman as the centre of decision-making improves postpartum outcomes and intrapartum satisfaction (McKenna & Symon, 2014).

Additionally, Stark (2013) explored the effects of showering during labour using a pretest-posttest single group design at a small community hospital in Michigan. Twenty-four women were observed for pain and level of comfort. The researcher used vital signs, a visual analogue scale for pain and the Gagge thermal comfort scale. The author found that there were significant differences in cervical dilation \((p=0.001)\), tension \((p=0.003)\) and fetal heart rate \((p=0.001)\) following shower therapy. Contractions were palpated in the shower by the health care provider, but were not felt by the parturients. The authors reinforce the need for further research in the effects of therapeutic showering during labour (Stark, 2013).

**Implications for Nursing**

When summarizing the literature regarding hydrotherapy during labour, it becomes apparent that water immersion during labour is a safe intervention supported by strong research and several well-regarded institutions. As noted in several of the practice guidelines (AOGC, 2016; ACNM, 2014; CMBC, 2014; NICE, 2016; RCM, 2012), environmental supports need to exist in facilities offering hydrotherapy such as: policies and procedures, adequate equipment and technology for maternal/fetal monitoring, and for sanitization of the tubs and pools. Providing adequate equipment may include measures such as providing waterproof electronic fetal heart monitors, personal protective equipment such as safety glasses and veterinary gloves, and ergonomic tubs. Facilities with policies and procedures to guide practice on factors such as patient eligibility for hydrotherapy build a strong foundation for safe implementation of water immersion during labour in hospitals.

Environmental support to implement hydrotherapy also extends to facility culture and interdisciplinary teamwork. Stark and Miller (2010) researched the barriers that RNs (n=401) perceive to implementing hydrotherapy using the Nurses’ Perceptions of the Use of Hydrotherapy in Labour questionnaire. Stark and Miller (2010) found that there were many significant barriers faced by nurses in hospital facilities. The researchers conclude that the culture of the birthing unit influences perception of barriers to the use of hydrotherapy in labour and that providing water immersion during labour requires a supportive environment, adequate policies, adequate staffing, and collaborative interdisciplinary teams (Stark & Millar, 2010). Further, there is a need to explore the individual and environmental factors that affect nurse implementation of hydrotherapy in labour in the Canadian context to holistically understand the factors, if any, impeding Canadian nurses from implementing water immersion in labour and delivery units.

Dogherty et. al. (2013) explored the barriers and facilitators to implementing evidence into health care practice. Themes found were factors at the individual, environmental, organizational, and cultural level (Dogherty et. al., 2013). The Nurses’ Perceptions of the Use of Hydrotherapy in Labour questionnaire (Stark & Miller, 2010) incorporates many of these themes and may be an ideal tool for further exploration of the use of hydrotherapy in Canadian nursing
practice. Assessing the perceived barriers to implementing evidence-informed practices such as hydrotherapy may provide an opportunity to explore and identify areas for improvement in healthcare environments and health organizations for supporting RNs in providing quality nursing interventions. Questionnaires such as the Nurses’ Perceptions of the Use of Hydrotherapy in Labour can also enable researchers to assess capacity and readiness to apply evidence-informed practices at the individual-demographic level.

Similarly, Gennaro (2010) examined the translation of evidence into practice in perinatal nursing settings. The authors postulate that barriers to knowledge translation include: professional, organizational, and systemic factors. Stark and Miller (2010) included factors in their questionnaire Nurses’ Perceptions of the Use of Hydrotherapy in Labour that may examine Gennaro’s (2010) identified barriers: personal concerns and health care environment. These two factors examine the individual and environmental barriers and catalysts to implementing hydrotherapy. Gennaro (2010) also found that the development of best-practice guidelines may facilitate practice changes in the future.

A Cochrane review of 18 studies exploring the implementation of guidelines into clinical practice found that there is some evidence that guideline-driven care is effective in changing the process and outcome of care provided by professions allied to medicine (Thomas et al., 2009). Therefore, evidence supports that with proper guidelines and organizational support; nurses may be able to implement hydrotherapy without hesitation (Thomas et al., 2009).

Hydrotherapy during labour is not only empowering for the patient, but also empowers nurses in influencing their environment and promoting positive patient outcomes as a result of their interventions (Vargens, Silva, & Progianti, 2013). Vargens et al. (2013) further emphasize that there is an urgent need to reflect upon the de-medicalization of birthing practices, as it will encourage labour nurses to see themselves as instruments of transformation capable of influencing their practice environment.

Conclusions

As supported by the research cited in this literature review, hydrotherapy is suggested to be a safe and efficacious method to alleviate labour pain during the first stage of labour (AOGC, 2016; ACNM, 2014; CMBC, 2014; Cluett & Burns, 2012; Jones et al., 2013; NICE, 2016; RCM, 2012; & Vargens et al., 2013). However, there is a need to explore the barriers that Canadian nurses perceive to hydrotherapy as there is a paucity of Canadian research on this matter. It is suggested that Stark and Miller’s (2010) research with the Nurses’ Perceptions of Hydrotherapy in Labour questionnaire be replicated with Canadian nurses to understand the barriers they may perceive to implementing water immersion during labour so as to deepen the understanding of the clinical reality and environmental context nurses in Canada face. Only then can systematic change take place in improving interdisciplinary collaboration and labour pain management practices. There is also a pressing need to create a nursing practice guideline for the implementation of hydrotherapy during labour as none presently exist.
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