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Use of Hydrotherapy in Labor to Promote Physiologic Labor

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Introduction

The pain of labor is well understood, yet, very difficult to treat. This is secondary to the fact that each woman's perception of pain varies as it is influenced by many different factors. According to Lowdermilk, Perry, Cashion, & Alden, (2012) how the woman perceives pain is "influenced by a variety of physiologic, psychological, emotion, social, cultural and environmental factors" (p. 387). A nurses' role is to act as a patient advocate and with that entails maintaining the patient's comfort throughout the labor process. In order to do so, a nurse must be able to assess the patient from not only the physiological standpoint, but also the emotional, social, and cultural standpoint in order to provide the optimal comfort for the patient. Once the pain level has been assessed, then comfort can be provided as tailored to the patient's needs.

Comfort can be divided into two different aspects: physiologic comfort and psychological comfort. Physiological comfort can be maintained by the use of pharmacological and non-pharmacological methods. Most women who are close to labor are aware of the pharmacological comfort measures such as an epidural, however, they lack knowledge in the non-pharmacologic methods. Non-pharmacological methods include, but are not limited to, hydrotherapy, massage and relaxation, music therapy, ambulation and position change, yoga, acupuncture and acupressure (Lowdermilk et al., 2012). These methods do not have the side effects and risks of pharmacologic methods. They also can be used to supplement the effectiveness of pharmacologic methods. Therefore, women should be encouraged to utilize these non-pharmacologic comfort measures during labor.

For the purpose of this article, hydrotherapy will be the non-pharmacologic comfort measure discussed. Hydrotherapy is defined as the immersion in warm water deep enough to cover the woman's abdomen in order to relieve pain and provide comfort (Simkin & Bolding, 2004).

Theoretical Explanation of Hydrotherapy

Hydrotherapy has been shown to be effective in reducing pain, relieving anxiety and providing a sense of control to the laboring woman (Stark & Miller, 2009). Most non-pharmacological methods are utilized during labor, and therefore, the purpose of such non-pharmacologic comfort measures are not necessarily to eliminate the pain completely, but rather decrease the perception of pain and provide comfort. By decreasing the level of anxiety the woman is experiencing will in turn decrease the pain perception and allow her to better cope with labor (Simkin & Bolding, 2004). The decrease of anxiety allows the woman to relax and feel more comfortable. With being more relaxed and feeling more comfortable the woman is more readily able to move and change positions, therefore, she is more likely to find a position of comfort (Stark, Rudell, & Haus, 2008). The warmth of the water allows for vasodilation allowing better blood flow throughout the body (Stark, Rudell, & Haus, 2008). Sitting in a tub of warm water also is familiar to most, giving her a safe and familiar space even when laboring in an unfamiliar hospital environment.

Literature Review

Pain

Barbosa da Silva, Vasconcellos de Oliveria and Nobre (2009) conducted a randomized control trial (RCT) at the Normal Birth Center of Ampar Maternal in Sao

Paulo, Brazil to evaluate the effectiveness of hydrotherapy on pain management during the first stage of labor. The study involved 108 nulliparous women, 54 of which received the hydrotherapy intervention while the other 54 received normal hospital routine care on the unit. The 54 that were part of the intervention group were asked to rate their pain using a scale of 0-10 with zero being no pain at all and 10 being the worst pain imaginable. The first score was recorded when the woman's cervix was dilated to 6-7 cm. At this time, she was asked to labor in the tub for 60 minutes. After time was up, each woman was again asked to again rate her current level of pain using the same scale as before (Barbosa da Silva, et al., 2009). The average score of the control group at the first evaluation was 7.1 whereas the intervention group was 6.7. After the immersion took place, the scores reported by the participants were 8.5 (intervention) and 9.3 (control). As one would expect, a woman's pain level will rise as labor progresses. Therefore, it is an expected finding that the pain score would increase, however, the effectiveness of hydrotherapy is recognized as the intervention groups average pain score was statistically significant with being lower than that of the control group's average pain score.

A study including 108 primiparous women was conducted by Liu (2014), in which 38 received water immersion and 70 underwent traditional labor. Once the women reached a dilation of 3 cm, they were able to get into the tub. A visual analog scale (VAS) was used to assess pain before entering tub , and then again assessed at 30 minutes, 60 minutes and 30 minutes after getting out of the tub. The scores were significantly higher in the control group at 30 and 60 minutes when compared to those who participated in the hydrotherapy.

Benfield et al. (2010) conducted a study in which 11 term women were placed in water to labor for an hour. Their pain levels were measured at preimmersion, 15 minutes, and 45 minutes. Results found hydrotherapy decreased pain, but not significantly. However, once the women were separated into groups of high levels of baseline pain versus low levels of baseline pain, results were significant in reducing pain in those from the high level of baseline pain.

Cluett and Burns (2014) conducted a systematic review in which 12 trials were analyzed. While many results were reported, the only statistically significant results were noted in reducing the report of moderate or severe pain in the use of all three different pain scales utilized.

Relaxation

Maude & Foreur (2007) asked women if they thought the water relieved their pain. Many of them did not believe that the water took their pain away, but rather relaxed them enough that they were not thinking of the pain (Maude & Foreur, 2007).

Stark, Rudell, & Haus (2008) conducted an experiment to evaluate position and movements with hydrotherapy. Results indicated that women utilized seven different positions while in the tub versus only four positions used while in the bed. This data suggests that the water allows for more relaxation and control of one's body and therefore women are able to change positions more frequently which has been indicated to improve better outcomes for both the mother and baby. They also noted that rhythmic movements were more noted during tub time, which is better at promoting fetal descent, versus being stationary in bed (Stark et al., 2008).

Confidence and Mood

Benfield et al (2010) indicated that anxiety was significantly reduced in their study involving 11 healthy, term women. Women were asked to rate their anxiety on a VAS scale ranging from 0-100 with zero indicating “no anxiety” and 100 indicating “maximum anxiety”. Scores were taken preimmersion followed by laboring in the tub for one hour in which anxiety levels were assessed at 15 and 45 minutes. Mean scores were 51.3, 33.1 and 29.3 (at preimmersion, 15 minutes and 45 minutes respectfully). This demonstrated significant decreased anxiety with the use of hydrotherapy.

Maude and Foreur (2007) gave 5 women a chance to express their experience during hydrotherapy in a qualitative study. The women shared their feelings in regard to multiple aspects of hydrotherapy. The general consensus of the women was that the water immersion was beneficial, however, most of the women struggled to explain how. The warmth of the tub, the comfort it offered and the safety and familiarity of being at home rather than in a hospital were explanations some provided (Maude & Foreur, 2009).

In the study conducted by Liu (2014), the 38 women who were apart of the water immersion completed a satisfaction survey, however, the results were not specifically indicated within the article. It was noted that 2 of the participants were “very satisfied” and 36 of the participants were “satisfied”.

Use of Analgesics

A systematic review conducted by Challiet et al. (2014) reviewed 57 randomized control trials in their effectiveness in relieving pain when compared to

usual care. Results indicated that there was a significant reduction of epidural use. Challiet et al. (2014) suggests that this is possible due to the Gate Control Theory; when non-painful massage is applied to the painful areas, the nociceptive message to the spine is blocked thus reducing the need for epidural analgesia.

Cluett and Burn (2014) also conducted a systematic review in which six trials reported data on the use of epidurals with hydrotherapy. The results indicated a significant decrease in the use of epidurals for those who utilized hydrotherapy at some point during labor.

Physiologic Effects

Although the process of labor is understood, the physiology of labor is less understood (Buckley, 2015). In her work, Buckley (2015) used physiology to provide explanation for physiologic labor and birth. There are three main aspects that will be discussed within this section to explain the physiology of hydrotherapy: Oxytocin, Beta-Endorphins, and Epinephrine-Norepinephrine.

Oxytocin is a naturally produced reproductive hormone that is produced during the labor process. In addition to stimulating labor contractions, oxytocin also affects mood by activating the parasympathetic nervous system to produce calmness and reducing activity of the sympathetic system. In doing so, fear, anxiety and stress decrease and women experience calm, connection and some analgesic effects (Buckley, 2015). By releasing this hormone the body is more able to relax and prepare for the strenuous endeavor of labor. Oxytocin also allows for more synced uterine contractions which therefore would decrease the length of labor (Buckley, 2015). Oxytocin level showed an increased after 15 minutes of water

immersion (Benfield et al., 2012) and has been used instead of Pitocin for labor augmentation (Cluett, Pickering, Getliffe, & Saunders, 2004)

Beta-Endorphins are another naturally produced hormone during the labor process, offering an analgesic effect that often produces a euphoric mindset for the woman. This change in mindset allows the woman to deal more effectively with the stressors that labor brings (Buckley, 2015). This hormone is not shown to be more beneficial than oxytocin, rather, the body needs both in order to provide the optimal body function for the woman during labor. Therefore, if there is too much stress and pain, elevated levels of beta-endorphins are produced, and then the production of oxytocin is suppressed (Buckley, 2015). In a study conducted by Benfield et al. (2010) beta-endorphin levels were increased, although not significantly, for all women in her study after 15 minutes of immersion in water. This suggests that hydrotherapy may affect beta-endorphins, thus supporting pain reduction and optimal uterine contractions.

Epinephrine-Norepinephrine hormones are responsible for the “flight or fight” response. This also is known as a catecholamine surge. They are released when the body feels threatened and preserve the function of vital organs such as the heart and lungs (Buckley, 2015). When the blood is being shunted to the maternal heart and lungs, it is not being distributed to the fetus. Therefore, when women are laboring, these levels ideally should be low. If a woman feels a threat in her privacy while laboring, this can also initiate the flight or fight response (Buckley, 2015) resulting in decreased blood flow to the fetus. Therefore, it is very important to make sure that the woman feels safe and her privacy is kept during labor. Benfield

et al. (2010) noted that catecholamine levels drastically decreased after 15 minutes of a woman being immersed in water.

Conclusion

Hydrotherapy provides many benefits to laboring women with little risk of side effects. It has the ability to relieve pain as well as anxiety along with increasing the women's mood and decreasing the use of analgesics. These benefits promote a physiologic birth to occur by increasing the release of oxytocin, beta-endorphins and suppressing the release of epinephrine-norepinephrine.

As there is evidence behind the use of hydrotherapy during labor, nurses need to be ready to implement the intervention. This requires nurses to be educated on hydrotherapy including the physiology and nurse care of women in hydrotherapy. First and foremost, nurses need to be educated as to how to safely provide hydrotherapy. Safety points, such as assisting the woman in and out of the tub, monitoring temperature of the water, assuring she can call for help if needed, and monitoring the fetus in labor need to be addressed. The equipment needed for this intervention, specific tub, cleanliness, and shoulder length gloves for nurses and health care providers, and waterproof-monitoring devices should be available. Protocols in regards to temperature of the water, length of tub time, and when it is appropriate to be laboring in the tub need to be clear. Education on how and what to assess while the woman is in the tub will also be vital to the care.

Further research is needed utilizing larger samples in order to continue to build more evidence for hydrotherapy. For example, there are conflicting results about when to enter the tub and how long a woman can safely stay in the tub.

Smaller studies would be valuable to evaluate some specific areas of hydrotherapy (i.e. how it effects specific hormones, how it directly works, etc.). At this time, hydrotherapy appears to be a safe and effective non-pharmacologic comfort measure in labor.

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