



IMMERSION HANDS AND FEET IN WARM WATER TO REDUCE PERINEAL PAIN AFTER VAGINAL DELIVERY: A RANDOMIZED CONTROLLED TRIAL

**Buranasak
Wongsiriphakdee***

Department of Obstetrics and Gynecology, Khon Kaen Hospital, Thailand.
*Corresponding Author

**Sukanda
Mahawerawat**

Department of Obstetrics and Gynecology, Khon Kaen Hospital, Thailand.

**Thumwadee
Tangsiriwatthana**

Department of Obstetrics and Gynecology, Khon Kaen Hospital, Thailand.

ABSTRACT

Objective: To assess the efficacy of immersion hands and feet in warm water for reduce perineal pain after vaginal delivery.

Materials and Methods: Postpartum sixty women after vaginal delivery with second degree perineal tear at Khon Kaen hospital from December 2018 to March 2019 were randomized into two groups, the study group received immersion hands and feet in warm water at 6 hours postpartum for ten minutes and standard postpartum care. The control group received only standard postpartum care. The primary outcome was decrease of perineal pain at 6 hours postpartum that measured by visual analogue score (VAS 0 - 100) and secondary outcomes were pulse rate and additional analgesic drug used.

Results: After immersion hands and feet in warm water the mean differences of perineal pain measured by VAS score at 6 hours postpartum was significantly lower in the study group compared with control group (12.2 ± 7.18 vs 3 ± 4.20 , $p < 0.001$). Moreover, Pulse rate and additional analgesic drug used within 24 hours were lower in the study group but no statistically significance.

Conclusion: Ten minutes immersion hands and feet in warm water can reduce perineal pain at 6 hours postpartum.

KEYWORDS : Immersion hands and feet in warm water, Perineal pain, Postpartum, Vaginal delivery.

INTRODUCTION

Perineal pain is common complication occurred after vaginal delivery and perineal pain was arisen from perineal tears, inflammatory reaction process and swelling of the adjacent tissues⁽¹⁾. There is evidence support that spontaneous perineal tear or episiotomy had most severity perineal pain at 6 hour postpartum⁽²⁾.

Pain is a complex nervous system, human pain perception is mixture of physical, cognitive, and emotional factor. Pain signal to brain are initiated when nociceptor which nerve ending of A and C fiber are stimulated⁽³⁾. Negative motion, mental stress are known to decrease parasympathetic activity and increase sympathetic activity⁽⁴⁾. The Inflammatory condition, Dendritic cell has up regulated alpha1-Rs and down regulated beta-2Rs. Activation of alpha1-Rs can induces release of pro-inflammatory cytokines and it can stimulated nociceptor. Sympathetic nervous system (SNS) which directly activate alpha1-Rs, all these mechanisms SNS activation could be predicted cause and maintenance of pain⁽⁵⁾.

Wide range of postpartum pain management methods are available, including use acetaminophen, NSAIDs, opioids and there are few researches to support use oral analgesia with another methods for management postpartum pain⁽⁶⁾.

Hands and feet warm bathing is simple technique that induce sensation of comfort and relaxation⁽⁷⁾. Duygu et al. showed that warm water footbaths led to relaxation by increase parasympathetic response and decrease sympathetic response⁽⁸⁾. Cal E et al. reported hands and feet warm bathing can reduce significant postoperative caesarean delivery pain⁽⁹⁾. Now a day, there was no evidence of the immersion hands and feet in warm water for reduced postpartum vaginal delivery perineal pain.

In the current study, we evaluated the effect of immersion hands and feet in warm water for reduce perineal pain after vaginal delivery.

MATERIALS AND METHODS

The study was conducted at Khon Kaen Hospital between December 2018 to March 2019. Postpartum women with second degree perineal tear were recruited, Informed consent was obtained from each eligible participant. The study was approved by Khon Kaen Hospital Institute Review Board in Human Research.

The inclusion criteria were postpartum normal vaginal delivery women (a) 18 or older, (b) second degree perineal tear. The exclusion criteria were (a) had medical diseases such as cardiovascular diseases, diabetes mellitus, psychiatric disorders, hypertension. (b) hands and feet complications such as injury or numbness, (c) perineal wound complication such as hematoma or infection.

The participants were randomly allocated into two groups, the study and control group- using a computer-generated block of four. The randomization list was kept in a sequential sealed-opaque envelope. The study group was received immersion hands and feet in warm water plus standard postpartum care, while the control group received only standard postpartum care.

All participants were received postpartum standard care such as nutritional counselling, early ambulation, breast feeding, perineal care and controlled pain by acetaminophen 500 mg every 6 hours in first day of postpartum. Khon Kaen hospital postpartum unit cares had controlled room temperature at 26 to 28 degree Celsius. The study group were received immersion hands and feet at level above wrist and above ankle in warm water which had monitored temperature by thermometer (36 to 37 degree Celsius) for 10 minutes at 6 hours postpartum. Perineal pain was measured by visual analogue scale (VAS 0-100) and assessed by participants at 5 minutes before the procedure and 30 minutes after the procedure.

The primary outcome was decrease perineal pain at 6 hour postpartum. The secondary outcomes Pulse rate and additional analgesic drug used in 24 hours were recorded by

nurses who was blind from the study.

The sample size was calculated based on the data from pilot study which had different of decreased perineal pain at nine point four with a 90% power at the 5% level of significance and a 10% drop out rate. The appropriate sample size was thus 60 participants (30 in each group).

Statistical analysis was performed using STATA version 13.0. Differences in continuous variables were analyzed with student t-test or non-parametric test due to characteristics of data distribution and were presented as mean and standard deviation (SD) or median and interquartile range (IQR). Categorical variables were analyzed by chi-square or fisher's exact test and were presented as number and percentage. P-value of < 0.05 was considered statistically significant.

RESULTS

Initially, 146 eligible participants were screened. Twenty-six of these did not meet the criteria due to had medical diseases such as diabetes mellitus, hypertension, perineal hematoma and 60 women were declined to participate. Totally of 60 women were randomized into the study and control groups. Figure 1 shows the study flow. The data from 60 participants were analyzed.

Both groups had similar baseline characteristics such as age, body mass index (BMI) at delivery, fetal birth weight, parity, perineal pain before immersion except in pulse rate before immersion (Table 1).

After the procedure, the mean differences of perineal pain measured by VAS score at 6 hours postpartum in study group was significantly lower than the control group (12.2±7.18 vs 3±4.20, p<0.001) (Table 2). In secondary outcomes median of pulse rate and additional analgesic drug used were decreased but no statistically significance between two groups (Table 2). Adverse events such as participants discomfort, first and second degree burn were not found in both groups.

DISCUSSION

In the current randomized controlled trial, we studied the efficacy of immersion hands and feet in warm water for reduce perineal pain after normal vaginal delivery. The study supports that 10 minutes immersion hands and feet in warm water is helpful in reduced perineal pain at 6 hours postpartum with second degree perineal tear when compared to standard care.

In baseline characteristic was similar between groups except pulse rate before immersion. Maybe multifactorial cause effect on pulse rate rather than perineal pain such as emotional, cognitive, stress, excited and activity of maternal before immersion.

In the primary outcome immersion hands and feet in warm water can reduced postpartum perineal pain at 6 hours, similar with Cal E et al. (6) reported that immersion hands and feet in warm water can reduced post caesarean delivery pain. Steed CE et al. (2) was found the sympathetic nervous system can responsible for causing and maintenance pain via increase pro-inflammatory cytokine and Yamamoto K et al. (7) revealed that wrapped warm foot bath led to relaxation and increased parasympathetic activity. Immersion hands and feet in warm water can reduce pain by increase parasympathetic activity and decrease in sympathetic activity. In this study, pulse rate variability decreased after immersion hands and feet in warm water. This supported our hypothesis that after immersion hands and feet in warm water can increase parasympathetic activity.

In secondary outcomes found that immersion hands and feet in warm water can reduce additional analgesic drug used in postpartum 24 hour. However, there was no statistically significant. Possibly the sample size was not enough to show significance in the secondary outcomes.

The strengths of the study are randomized controlled study, no dropout participant and using low cost and simple procedure. Limitation of the study was cannot blind participant. Moreover, Third and Forth degree perineal tear, type of perineal tear and both of satisfaction health care providers and participants should be evaluated.

CONCLUSION

10 minutes Immersion hands and feet in warm water can reduce perineal pain after 6 hours vaginal delivery when compared with standard care. Because this is a simple technique and no harmful, the immersion hands and feet may be the alternative method to reduce postpartum perineal pain.

Potential conflicts of interest

The authors declare no conflicts of interest

Acknowledgments

The authors thank (a) the participants for their cooperation and (b) staff and nurse in Obstetrics and Gynecologic department KhonKaen Hospital.

Figure 1. Study flow

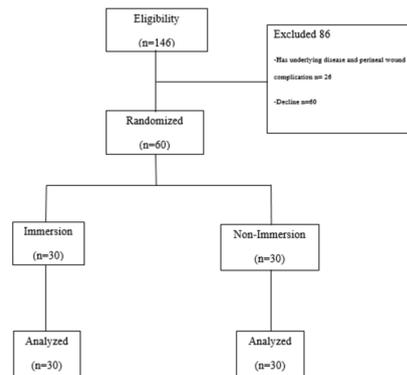


Table 1. Baseline Characteristic.

	Immersion (n=30)	Non immersion (n=30)	p-value
Age(year) mean ± SD	24.7±5.3	26.7±5.3	0.153
Birth weight(gram) mean ± SD	2863.6±412.6	3034±389.7	0.105
BMI(kg/m2) mean ± SD	26.1±4.5	26.5±4.1	0.768
Parity			
Nulliparous (n %)	16(53%)	13(43%)	0.600
Multiparous (n %)	14(47%)	17(57%)	
Pulse rate before immersion (bpm) Median(IQR)	92.5(88-100)	88(84-96)	0.017
Pain score before immersion (VAS) score mean ± SD	38.6±18.5	36.1±15.0	0.573

Table 2. Outcome.

	Immersion (n=30)	Non immersion (n=30)	95%CI	p-value
VAS score change after immersion score mean ± SD	12.2±7.18	3±4.20	(5.71-9.55)	<0.001

Pulse rate after immersion (bpm) median(IQR)	88(80-93)	87(80-92)		0.100
Additional analgesic drug used in 24 hrs. (mg) mean±SD	350±267.4	466.6±260.4		0.092

REFERENCES

1. LaFoy J, Geden E. Postepisiotomy Pain: Warm Versus Cold Sitz Bath. *J Obstet Gynecol Neonatal Nurs* 1989;18:399-403.
2. Senol DK, Aslan E. Perineal pain severity in Postpartum Period Evaluated Six Hours and Three months after delivery. *J Caring Sci* 2018;11:1691-1696.
3. Steeds C. The anatomy and physiology of pain. *Surgery* 2016;34:55-59.
4. Fauchon C, Pichot V, Faillenot I, Pommier B, Garcia-Larrea L, Peyron R et al. Contextual modulation of autonomic pain reactivity. *Auton Neurosci* 2018;212:28-31.
5. Schlereth T, Birklein F. The Sympathetic Nervous System and Pain. *Neuromolecular Med* 2007;10:141-147.
6. Fahey J. Best Practices in Management of Postpartum Pain. *J Perinat Neonatal Nurs* 2017;31:126-136.
7. Yamamoto K, Aso Y, Nagata S, Kasugai K, Maeda S. Autonomic, neuro-immunological and psychological responses to wrapped warm footbaths—A pilot study. *Complement Ther Clin Pract* 2008;14:195-203.
8. Aydin D, Hartiningsih S, Izgi M, Bay S, Unlu K, Tatar M et al. Potential beneficial effects of foot bathing on cardiac rhythm. *Clin Invest Med* 2016;39:48.
9. Cal E, Cakiroglu B, Kurt A, Hartiningsih S, Dane S. The Potential Beneficial Effects Of Hand And Foot Bathing On Vital Signs In Women With Caesarean Section. *Clin Invest Med* 2016;39:86.