



COMPARISON OF COUNTER PRESSURE MASSAGE AND HEGU POINT COLD COMPRESS ON ACTIVE PHASE I LABOR PAIN

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ABSTRACT

Labor pain can cause it weakness of the uterine muscles, obstruction of the birth canal and increased maternal anxiety. Anxiety can produce catecholamine hormones that cause tension in the pelvic muscles and affects the mother's pushing force during childbirth so that the pain increases and lengthens the delivery time increases the risk of maternal and fetal death. The purpose of this research is to determine the comparison of counter pressure massage (CPM) and Hegu point cold compresses for labor pain during the 1st active phase. The research method uses a randomized control trial design with two group pretest-posttest plan. Population in this study namely mothers who will give birth in the active phase of the 1st stage with the number of samples A total of 126 people were divided into 2 groups each CPM treatment and cold compresses will be given to the Hegu point. The measuring instruments used are the numerical pain rating scale (PNRS) and pain level recording sheets which have been proven valid and reliable, and have been widely used to measure pain levels. The analysis that will be used is univariate and bivariate analysis paired t test and independent t test. The results of the study showed that there was a difference in the intensity of labor pain during the first active phase before and after counter pressure massage ($p=0.000$) and cold compress at the hegu point ($p=0.000$). And there was no difference in the intensity of pain during the first active phase of labor between the counter pressure massage and cold compress groups in the Hegu point group ($p=0.546>0.05$). Cold compress counter pressure massage on the Hegu point is effective in reducing pain in the first stage of labor and counter pressure massage and cold compresses on the Hegu point group are equally effective in reducing labor pain.

Keywords: counter pressure massage; hegu cold compress; painful; stage 1

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INTRODUCTION

Every birth is always accompanied by pain (Deshmukh et al., 2024). Labor pain occurs due to the physiological process of labor in the form of uterine contractions which cause dilation and opening of the cervix and the pushing of the fetal head into the pelvis (Lee & Neumeister, 2020). Stage 1 of the labor process is the initial stage which consists of a latent phase which lasts 7 hours and an active phase which lasts 6 hours. The labor pain felt by the mother begins in the first stage of the latent phase, namely when the cervix dilates to 04 cm. However, the pain in the active phase is felt to be more intense and continues to increase, where when the cervix is opened 4-7 cm the pain is felt to be quite pressing and when the cervix is opened 8-10 cm the pain feels more intense, piercing and stiff (Baxter et al., 2021).

Labor pain can cause disruption in the coordination of uterine contractions and result in prolongation of the first stage of labor and the condition of the fetus will be disturbed. The fear of pain that occurs in the mother can also stress the fetus in the womb, which will be dangerous if the birth process proceeds normally because the oxygen supply to the fetus is reduced, the fetal heartbeat weakens (Karunarathna et al., 2024). Excessive pain, increased fear and anxiety can result in increased catecholamine secretion. Catecholamine secretion

causes tension in the pelvic muscles, resulting in resistance to the repulsive force of the uterus and the repulsive force exerted by the birthing mother. Prolongation of this condition results in additional pain during labor and is dangerous for the fetus (Türkmen & Oran, 2021). Handling labor pain can be done with pharmacological therapy such as anesthesia by an anesthesiologist or non-pharmacological methods such as relaxation, imagination and visualization, massage and temperature stimulation (Tri Astuti et al., 2019). One non-pharmacological method that has no side effects, is comfortable and easy to do is counter pressure massage (CPM) and Hegu point cold compresses (Rejeki et al., 2021)

CPM is a massage action with quite strong pressure on certain points in the lower back during uterine contractions (Astuti et al., 2021). The results of the study showed that there was an effect of giving CPM on reducing pain during the first active phase in mothers giving birth. Other studies also show that CPM is effective in reducing pain in the first stage of labor. CPM in the sacrum or fifth lumbar area using the fist or heel of the hand during contractions for 20 minutes can have a therapeutic effect and maximum relaxation in tense muscles so that it can open narrow blood flow (Lebang & Firdaus, 2023). CPM also reduces tension in the sacro iliac area thereby reducing tension due to internal pressure from the fetal head. Giving CPM can inhibit pain that is transmitted to the spinal cord and brain, besides that CPM can stimulate the release of endorphines, so that pain impulses can be inhibited. Apart from CPM, Hegu point cold compresses can also reduce labor pain during the first active phase. Hegu point cold compress is a cold compress therapy that is applied to the highest point between the index finger and thumb when brought together by providing cold stimulation to the body's accupoint points (Indrayani et al., 2024). A cold compress on the Hegu point given for 20-30 minutes can relieve pain during contractions in the active phase of 1st stage of labor (Yildirim et al., 2018).

METHOD

The research method used was quantitative, namely a randomized control trial design with a two group pretest-posttest design. Research subjects were taken using a single blind method. The sample that used mothers giving birth during the first active phase was 126 respondents who were divided into two groups. The research was conducted from February to August 2024 at eight BPMs in the Banda Aceh City area. This research has carried out ethical tests so as not to violate research ethics. Before carrying out the CPM or cold compress intervention at the Hague point, the researcher explained the aim and procedures of the research to the respondent, obtained consent, and continued by carrying out pain observations after completing the pain observation and continued by providing a similar intervention. with a cold compress CPM or Den Haag point for 20-30 minutes. Data analysis in this study used a dependent t test (paired t-test) to assess the difference in average pain before and after intervention and an independent t test to assess which intervention was more effective in reducing pain.

RESULT

This research was conducted at 8 BPMs in the Banda Aceh city area which have collaborated with Bina Bangsa Getsempena University consisting of PMB Jawiriyah, PMB Cut Khairiati, PMB Erniati, PMB Suriati, PMB Mariana, PMB Mutia Yacob, PMB Erni Munir, PMB Ida Irian has been operating on average since 2000. The practice schedule for all BPM is 24 hours and accepts patients who will undergo normal childbirth. The average number of patients giving birth normally every day is 3 to 4 people with a dilation of 4 cm to 10 cm and the patient experiences pain that increases over time.

Table 1.
Respondent characteristics (n= 126)

Respondent Characteristics	Group counter pressure massage		Group cold compress hegu point	
	f	%	f	%
Age (Years)				
17-25 (Late Teens)	20	31,7	24	38,1
26-35 (Early Adulthood)	43	68,3	39	61,9
Mean±SD	26,98±3,499		26,46±2,513	
Education				
Intermediate	38	60,3	51	81
Tall	25	39,7	12	19
Parity				
Primipara	19	30,2	33	52,4
Multiparous	26	41,3	24	38,1
Grande Multipara	18	28,6	6	9,5
Work				
Teacher	5	7,9	6	9,5
Private	4	6,3	5	7,9
Dose	2	3,2	2	3,2
Nurse	1	1,6	-	-
IRT	51	81,0	50	79,4

This research found that in the counter pressure massage group more than two thirds of respondents (68.3%) were aged between 26-35 years with an average age of 26.98 years, less than two thirds of respondents (60.3%) had secondary education. , more than half of the respondents (41.3%) are multiparous and most of the respondents (81%) work as housewives. Meanwhile, in the Hegu point cold compress group, less than two-thirds of respondents (61.9%) were aged between 26-35 years with an average age of 26.46 years, most respondents (81%) had secondary education, more than half of the respondents (52.4%) were primiparous and more than three quarters (79.4%) of the respondents worked as housewives.

Table 2.
Respondent characteristics (n= 126)

Pain Intensity	Group counter pressure massage				Group cold compress hegu point			
	Before		After		Before		After	
	f	%	f	%	f	%	f	%
Mild Pain	-	-	4	6,3	-	-	5	7,9
Moderate Pain	45	71,4	55	87,3	43	68,3	55	87,3
Severe Pain	18	28,6	4	6,3	20	31,7	3	4,8
Very Severe Pain	-	-	-	-	-	-	-	-
	6,06±0,982		4,75±0,967		6,06±0,948		4,67±0,967	

This research shows that of the 63 respondents in the counter pressure massage group before the intervention, less than three quarters of respondents (71.4%) experienced moderate pain and more than a quarter of respondents (28.6%) experienced severe pain with an average pain of 6. 06 (SD=0.982). Meanwhile, after the intervention, the majority of respondents (87.3%) experienced moderate pain, less than a quarter of respondents (6.3%) experienced mild and severe pain with an average pain of 4.75 (SD=0.967). Meanwhile, of the 63 respondents in the Hague point cold compress group before the intervention, more than three quarters of respondents (68.3%) experienced moderate pain and less than all respondents (31.7%) experienced severe pain with an average pain of 6.06 (SD=0.948). Meanwhile, after the intervention, the majority of respondents (87.3%) experienced moderate pain, less than a quarter of respondents (7.9%) and (4.8%) experienced mild and severe pain with an average pain of 4.67 (SD=0.967)

Table 3
Respondent characteristics (n= 126)

	Mean Rank	Z	p
Before-after counter pressure massage	28,50	-6,718	0,000
Before-after cold compress hegu point	30,50	-6,986	0,000

The analysis test results show that there is a difference in the intensity of labor pain during the first active phase before and after counter pressure massage ($p=0.000$) and Hegu point cold compress ($p=0.000$) with a confidence level of 95%. So, it can be concluded that the p value is <0.05 , which means there is a difference in the intensity of labor pain during the first active phase before and after counter pressure massage and cold compresses at the Hegu point.

Table 4
Respondent characteristics (n= 126)

	Sum of Rank	U	p
Counter pressure massage group and cold compress on Hegu point	4002-3999	198	0,994

The results of the analysis test showed that there was no difference in the intensity of labor pain in the active phase of the first stage between the counter pressure massage and Hegu point cold compress groups. The results of the statistical analysis test showed that the intensity of labor pain in the active phase of the first stage between the counter pressure massage and cold compress Hegu point groups had a value of $p=0.994$ with a confidence level of 95%. So it can be concluded that the p value is > 0.05 , which means there is no difference between the counter pressure massage and Hegu point cold compress groups on the intensity of labor pain in the first stage of the active phase in mothers giving birth

DISCUSSION

Difference in Average Pain Intensity During Active Phase of Stage I Labor Before and After Counter Pressure Massage

Based on the research findings, there is a significant difference in pain intensity during the active phase of stage I labor before and after counter pressure massage ($p=0.000$) with a confidence level of 95%. Therefore, it can be concluded that $p<0.05$, indicating that there is a difference in pain intensity during the active phase of stage I labor before and after counter pressure massage. These findings align with the research conducted by Cahyawati et al., which showed that counter pressure massage can reduce pain and anxiety in women during the active phase of labor (Lee & Neumeister, 2020). Research by Wardiyaningtuti et al. also indicates an impact of counter pressure massage technique on pain reduction during the active phase of stage I labor (Yulianingsih et al., 2019). Counter pressure massage is a non-pharmacological technique for relieving labor pain, which involves applying pressure to the nerves in the lower back area for 20 minutes while the woman is seated, during uterine contractions that cause lower back pain. Physiologically, high levels of labor pain can induce anxiety, especially in first-time mothers. Pain is associated with a failure of the immune system's physiological mechanisms, temperature regulation, and normal biological changes, which can precipitate anxiety (Lebang & Firdaus, 2023)

The counter pressure massage is applied to the lumbar area, where the sensory nerves of the uterus and cervix travel alongside sympathetic nerves, entering the spinal cord through thoracic nerves 10, 11, 12 to lumbar 1 (Tri Astuti et al., 2019). This can quickly block pain impulses, preventing pain signals from being transmitted to the cerebral cortex. The technique involves steady and strong pressure applied to a point in the lower back during contractions using the heel of the hand or pressure on each hip using both hands. The counter pressure helps alleviate back pain during labor, particularly in women experiencing labor pain

(Taherian et al., 2020) According to the researchers' assumptions, the 20-minute counter pressure massage can compete with the pain stimulus during the active phase of stage I labor, inhibiting pain signals from reaching the cerebral cortex.

Difference in Average Pain Intensity During Active Phase of Stage I Labor Before and After Cold Compress at Hegu Point

The research results indicate a significant difference in pain intensity during the active phase of stage I labor before and after cold compress at the hegu point ($p=0.000$) with a confidence level of 95%. Therefore, it can be concluded that $p<0.05$, which signifies a difference in pain intensity before and after the cold compress at the hegu point. These findings align with the study by Tri Astuti et al. (2019) showing that cold compress at the hegu point can reduce pain. Research by Reka et al. (2024) demonstrated that stimulation of the hegu point, located between the thumb and index finger, can alleviate labor pain. Studies conducted by (Hajiamini et al., 2012; Zhang et al., 2024) also indicated that ice massage at the hegu point effectively reduces pain intensity during labor, making it a viable non-pharmacological intervention for pain relief. The application of cold compress can reduce pain and relax muscles by decreasing prostaglandins that heighten pain receptor sensitivity and other subcutaneous factors at the injury site, thereby inhibiting inflammation (Safuan et al., 2024).

The physiological effects of cold therapy can lower skin and underlying tissue temperatures, causing vasoconstriction. Vasoconstriction reduces blood flow to the affected area, consequently decreasing oxygen supply, metabolic capacity, and waste disposal rates, leading to a pale and cool skin appearance (Tri Astuti et al., 2019). The mechanism of cold compress application may enhance endorphin release, which inhibits pain signal transmission and stimulates large-diameter beta nerve fibers, thus reducing pain impulse transmission through smaller delta and C fibers. Cold compress using ice slows down peripheral nerve conduction and diminishes the release of inflammatory mediators and nociceptors, resulting in a relatively quick anesthetic effect on the skin (Anugerah et al., 2017). The hegu point, located between the thumb and index finger, also has profound effects on the central nervous system and the uterus. According to (Yildirim et al., 2018), stimulation of the hegu point is transmitted through the spinal cord, activating the hypothalamus and pituitary gland to release endogenous opioid peptides to the periaqueductal gray matter and the nucleus raphe magnus. Subsequently, these endogenous opioid peptides inhibit pain through opioid mechanisms, leading to analgesic effects that block all pain impulses at the dorsal horn of the spinal cord (Li et al., 2024). According to the researchers' assumptions, massage applied at the cold compress hegu point may stimulate the hypothalamus and pituitary glands, resulting in the release of endogenous opioid peptides that exert analgesic effects to inhibit pain signals in the spinal cord.

Difference in Pain Intensity During Active Phase of Stage I Labor Between Counter Pressure Massage and Cold Compress at Hegu Point

Based on the research findings, there is no significant difference in pain intensity during the active phase of stage I labor between the counter pressure massage group and the cold compress at the hegu point group ($p=0.546>0.05$). This means that both interventions are effective in reducing pain during the active phase of labor. Counter pressure massage has an impact on reducing pain intensity during the active phase of stage I labor (Rejeki et al., 2021). Other studies also confirm the effectiveness of counter pressure massage techniques in alleviating pain during this phase (Wardiyaningtuti et al., 2023). Counter pressure massage involves consistent and strong pressure applied to several points in the lower back during contractions in the active phase of stage I labor, using the fist, palm, or a firm object. The

mechanism of counter pressure massage in the sacral area operates by inhibiting the pain signal gate (gate control theory) that transmits signals to the spinal medulla and brain (Dianna & Oktaviyani, 2024). This theory posits that pain impulses can be managed or even inhibited by defensive mechanisms alongside the central nervous system. Pain impulses are transmitted when defenses are open and are inhibited when they are blocked. The therapeutic principle of blocking these defenses is crucial for pain relief (Rejeki et al., 2021)

Counter pressure massage is particularly effective in reducing pain during the early stages of active labor, competing with pain transmission to the spinal medulla and brain. The strong pressure applied through massage can activate endorphins, interrupting pain transmission and reducing pain sensations at the spinal cord synapse and brain cells (Safrida & Nadeak, 2024). Endorphins are brain chemicals known as neurotransmitters that transmit electrical signals within the nervous system. They are found in the pituitary gland, and stress and pain are two common triggers for endorphin release. Endorphins interact with opioid receptors in the brain to diminish our perception of pain, functioning similarly to drugs like morphine and codeine, but without causing addiction or dependency (Hibatulloh et al., 2022). The hegu point is located on the hand, specifically in the soft area between the index and thumb. This point has a strong influence on the mind and can be used to calm thoughts and alleviate anxiety. Primary dysmenorrhea can result from stress and psychological disturbances; thus, applying cold compress at the hegu point can address these issues (Braz et al., 2014). Acupressure enhances uterine contraction effectiveness and supports endorphin production. According to Mongan, endorphins can increase the release of oxytocin, a hormone that facilitates labor and reduces pain. Endorphin-induced massage can enhance oxytocin release, stimulating pain reduction.

CONCLUSION

Counter pressure massage and cold Hagu point compresses are effective in reducing pain in the active phase of labor because both interventions can stimulate the release of endorphin hormones to increase feelings of relaxation and inhibit the transmission of painful stimuli so that they can reduce the sensation of pain during the first active phase in mothers giving birth.

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