

Specification Acupuncture Points Li4 and Sp6 in Postpartum Sectio Caesarea Pain

Nurul Azizah^{1*}, Rafhani Rosyidah¹, Jamilatur Rohmah²

¹ Midwifery Department, Faculty of Health Science, Universitas Muhammadiyah Sidoarjo, Indonesia

² Medical Laboratory Technologies Department, Faculty of Health Science, Universitas Muhammadiyah Sidoarjo, Indonesia

ARTICLE INFORMATION

Received: 22, May, 2023

Revised: 26, August, 2023

Accepted: 8, September, 2023

KEYWORD

Acupuncture; LI4; Pain; Postpartum; SP6

Akupunktur; Li4; Nyeri; Nifas; Sp6

CORRESPONDING AUTHOR

Nurul Azizah

Candi Sidoarjo

nurulazizah@umsida.ac.id

+6281553902006

DOI

<https://doi.org/10.36456/embrio.v15i2.7281>

ABSTRACT

Postoperative pain can affect the postpartum SC's mobility, and the physical healing process after surgery can also trigger physiological stress and anxiety due to wound pain. The presence of side effects from analgesic use prompts the exploration of non-pharmacological treatments as an alternative for pain management in post-SC clients, as they are considered to have low side effects. Acupuncture, as one of the non-pharmacological complementary therapies, has been developed to address pain. This research aims to identify the Specific Points of Acupuncture, Li4 and Sp6, in Postpartum Cesarean Section (SC) Pain. The research design employed a quasi-experimental clinical approach, specifically a non-equivalent pre-posttest with a control group. This involved identifying pain reduction before and 24 hours after administering acupuncture intervention at specific points, LI4 and SP6, for a duration of 30 minutes. The study included a total of 34 participants in both the treatment and control groups. The research was conducted at Airlangga University Hospital in Surabaya. The subjects of the study were patients who met the inclusion criteria. The Pain Numeric Rating Scale was used as the research instrument. Statistical analysis involved employing one-way ANOVA to observe the mean change in values between the pre-test and post-test within each group. The administration of acupuncture therapy targeting points LI4 and SP6 in this study proved effective in reducing postpartum SC pain compared to the control group. In future research, further investigation could be conducted to identify changes in chemical reactions within the body following acupuncture treatment.

Nyeri pasca operasi dapat mempengaruhi mobilisasi postpartum SC, proses penyembuhan fisik pasca operasi juga dapat menimbulkan stres fisiologi dan cemas akibat nyeri luka jahitan. Efek samping dari penggunaan analgesik memicu pengobatan nonfarmakologi sebagai alternatif pengobatan nyeri pada klien post SC karena dinilai memiliki efek samping rendah. Akupunktur sebagai salah satu terapi komplementer non-farmakologis telah dikembangkan untuk mengatasi nyeri. Penelitian ini bertujuan mengidentifikasi spesifikasi titik akupunktur Li4 dan Sp6 pada nyeri postpartum seksio sesarea (SC). Desain penelitian menggunakan quasi experimental clinical, non-equivalent pre-posttest with control group, yakni dengan mengidentifikasi penurunan nyeri sebelum dan 24 jam setelah diberikan intervensi akupunktur pada titik LI4 dan SP6 secara spesifik, selama 30 menit, jumlah responden sebanyak 34 pada masing-masing kelompok perlakuan dan kontrol. Tempat penelitian dilaksanakan di RS Universitas Airlangga Surabaya. Subyek penelitian ini pasien yang memenuhi kriteria inklusi. Instrumen pada penelitian menggunakan skala nyeri PNRS. Analisis uji statistik menggunakan one way ANOVA untuk melihat rerata perubahan nilai pre dan posttest masing-masing kelompok. Hasil Pemberian terapi akupunktur antara titik LI4 dan SP6 pada penelitian ini efektif menurunkan nyeri postpartum SC dibandingkan kelompok kontrol. Pada penelitian berikutnya dapat dilanjutkan untuk identifikasi perubahan reaksi kimia pada tubuh dengan pemberian akupunktur.

Introduction

The 2012 Indonesia Demographic and Health Survey (IDHS) reported that mothers who give birth through cesarean section often experience complications (55%). Rupture of the uterine wall leads to issues with hemostasis and blood circulation, which can trigger pain, bleeding, and infection. These complications can be prevented through physical monitoring and early mobilization efforts for post-cesarean section mothers (Gan et al., 2014). Early mobilization is an essential aspect of improving physiological function. One of the benefits of early mobilization is accelerating wound healing and facilitating blood circulation (Kasdu, 2003). The study conducted by Barid (2011) demonstrated that early mobilization in mothers after cesarean section accelerates the wound healing process and reduces the length of hospital stay (Dini, 2013; Kasdu, 2003).

Physiological stress can occur in postpartum mothers who have undergone a cesarean section due to the presence of wound pain. The process of physical wound healing can lead to complications following surgery, such as pain and anxiety (Saatsaz et al., 2016). Cesarean section, also known as C-section, is a surgical procedure performed under anaesthesia that involves making an incision in the uterine wall to deliver the fetus, placenta, and amniotic fluid (Diane & Margaret, 2009). The experience of pain can disrupt the mobility of mothers. The administration of analgesics as pain treatment can lead to allergies or other complications (Schoenwald et al., 2013).

In patients who continue to experience pain, it will affect the mobility of mothers post-Caesarean section, as well as their ability to recover and comply with treatment (Paice & Ferrell, 2011). Several interventions, such as relaxation techniques, distraction techniques, massage, aromatherapy, and the use of herbal remedies, are highly effective in alleviating pain and anxiety (Joyce & Jane, 2014). Acupuncture is a form of non-pharmacological therapy based on the concept of balancing yin and yang and utilizing meridians as channels of energy flow for healing purposes (Zhong et al., 2019). A hypothesis suggests that acupuncture points possess electrical properties, and when stimulated, they can alter chemical neurotransmitters in the body. This stimulation may activate specific points along the meridian system, which are transmitted through major nerve fibers to the reticular formation, thalamus, and limbic system, ultimately triggering the release of endorphins in the body (Alimoradi et al., 2019).

According to research studies, acupuncture points such as LI4 (Hegu), SP6 (Sanyinjiao), and ST36 (Zusanli) also play a role in pain modulation. The combined use of acupuncture on LI4 and SP6 has been reported in several studies to be effective in inducing labor and reducing labor pain (Tournaire & Theau-Yonneau, 2007). This study aims to specifically compare the effects of acupuncture on LI4 and SP6 points regarding pain in postpartum cesarean section (SC) patients.

Method

The research design employed in this study is a quasi-experimental clinical approach with a non-equivalent post-test-only control group. The respondent selection was based on inclusion criteria, including postpartum cesarean section (SC) patients who were 24-48 hours post-operation, had been removed from intravenous infusion, were receiving oral paracetamol 500mg 3 times a day for pain relief,

and gave informed consent. Exclusion criteria included heart disease, blood clotting disorders, parity less than 4, and those with good nutritional status. The study involved a total of 102 respondents, with 34 in the LI4 group, 34 in the SP6 group, and 34 in the control group. The research aimed to identify the reduction in pain before and 24 hours after acupuncture intervention. The measurement instrument used for pain intensity was the Pain Numeric Rating Scale (PNRS). The study was conducted from February to April 2023 at Universitas Airlangga Hospital. The subjects were postpartum patients who met the inclusion criteria. Statistical analysis employed one-way ANOVA with a significance level of $P < 0.05$ to assess the mean changes in pre-test and post-test values for each group. The analysis aimed to identify differences in pain intensity before and after acupuncture intervention, specifically on LI4 and SP6 points, compared to the control group.

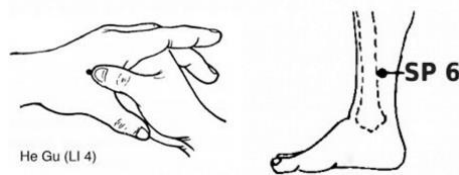


Figure 1. LI4 and SP6 points

Results

Table 1. Presents the Frequency Distribution of Respondents' Characteristics

Characteristics	Intervensi LI4 and SP6	Control	P Value
Age			
Low Risk 20 - 35th	102 (100%)	102 (100%)	0.869
High Risk <20 – >35th	0 (0%)	0 (0%)	
Parity			
Primigravida	30 (29.41%)	25(24.5%)	0.796
Multigravida	22 (21.5%)	26 (25.4%)	

The sample distribution demonstrates comparability among the research subjects, indicating homogeneity. The research variables of age and parity show that the pain scores before the intervention did not exhibit any significant differences ($P > 0.05$). These results suggest that the data were evenly distributed before the study was conducted.

Table 2. Homogeneity Distribution of Respondents Before Intervention

	n	Sig
Pretest	102	0.173
Posttest	102	0.005
Reduction Difference	102	0.009

The sample distribution demonstrates comparability among the research subjects, indicating homogeneity. The research variables of age and parity show that the pain scores before the intervention did not exhibit any significant differences ($P > 0.05$). These results suggest that the data were evenly distributed before the study was conducted.

The intervention group receiving acupuncture at LI4 for postpartum SC showed an average decrease in pain intensity of 3.94 (Table 3), while the decrease in pain intensity at point SP6 after acupuncture intervention had an average of 3.39. In contrast, the control group's difference in pain intensity measured again after 24 hours had an average of 1.30, with a P-value of < 0.05 indicating a significant difference.

Table 3. Frequency Distribution of Pain Intensity Before and After Acupuncture Intervention at LI4 and SP6 Combination Points

		T-Test Mean	n	sig
Pretest	Acupuncture LI4	8.82	34	0.120
	Acupuncture SP6	8.64	34	
	Control	8.48	34	
Posttest	Acupuncture LI4	4.88	34	0.000
	Acupuncture SP6	5.24	34	
	Control	7.18	34	
Reduction Difference	Acupuncture LI4	3,94	34	0.000
	Acupuncture SP6	3,39	34	
	Control	1,30	34	

Discussion

The results of this study indicate a significantly better mean reduction in pain intensity in the intervention group compared to the control group. Moreover, within the intervention groups, the average difference in pain intensity reduction was notably higher in the group receiving acupuncture at LI4 than in the SP6 group. Administering acupuncture at LI4 has the benefit of reducing pain intensity by activating the hypothalamus and the pain modulation centers in the Periaqueductal Gray (PAG) and nucleus raphe magnus (NRM) (Shen, 2001). Electrical stimulation of the periventricular structures in the PAG can inhibit the activity of nociceptive neurons in the dorsal horn to reduce pain. Acupuncture stimulation at LI-4 results in the endogenous activation of antinociceptive pathways in the hypothalamus and midbrain due to increased endorphinergic activity in the hypothalamus. These endorphinergic neurons then project to the PAG and raphe nucleus, thereby inhibiting pain stimuli. Afferent input from these nerve fibers inhibits the propagation of nociceptive signals carried by small, unmyelinated C fibers by blocking transmission along these nerve fibers to target T cells present in the dorsal horn's substantia gelatinosa (S. Chen et al., 2019; Yu et al., 2013).

The mechanism of analgesia produced by acupuncture can be explained by the Gate Control Theory. This theory elucidates that nerve fibers with smaller diameters carrying pain stimuli share the same neural "gate" as fibers with larger diameters that transmit impulses from mechanoreceptors. When both types of nerve fibers pass through the smaller gate simultaneously, the gate is typically closed, blocking the constant transmission of nociceptive signals through C fibers to reach target T cells. However, when peripheral pain stimulation occurs, the information carried by C fibers reaches the target T cells, causing the gate to open. This opening leads to central transmission to the thalamus and cortex, where the impulses are interpreted as pain (T. Chen et al., 2020; Hsieh et al., 2001; Yu et al., 2013).

The use of acupuncture therapy cannot completely eliminate pain, but it can inhibit postoperative pain. Stimulation at points LI4 and SP6 works segmentally on the spinal cord, ultimately affecting both sympathetic and parasympathetic nerve fibers. Sympathetic nerve fibers exit the spinal cord at the thoracolumbar segments, while parasympathetic nerve fibers exit cranially through cranial nerves III, VII, IX, and X, as well as from the sacral segments of the spinal cord. Consequently, these points can help inhibit pain (T. Chen et al., 2020; Sprouse-Blum Ba et al., 2010).

The study conducted by Asadi et al. (2015) Involved 63 postpartum mothers who were divided into two groups: the acupuncture group at LI-4 and SP6 points. The research results indicated a

difference in pain reduction, with the average pain level in the acupuncture group decreasing from 7.6 before the intervention to 5.1 after the intervention. Psychological factors, such as excessive fear and anxiety, can exacerbate the sensation of pain. Labile psychological conditions and situations play a significant role in intensifying postpartum SC pain. One of the psychological defense mechanisms against stress is conversion, where psychological distress is manifested as physical symptoms (Gan et al., 2014; Reddi & Curran, 2014; Wu et al., 2009). One hypothesis suggests that acupuncture points possess electrical properties that stimulate chemical neurotransmitters in the body. This stimulation activates specific points along the meridian system, which are then transmitted through large nerve fibers to the reticular formation, thalamus, and limbic system, leading to the release of endorphins in the body. Endorphins are natural pain-relieving substances produced by the body, providing calming responses and boosting morale. They have positive effects on emotions, inducing relaxation, normalizing bodily functions, and enhancing blood circulation (Bushnell et al., 2013; Pogatzki-Zahn et al., 2017; Sprouse-Blum Ba et al., 2010).

Conclusions

The administration of acupuncture therapy between the LI4 and SP6 points in this study effectively reduces postpartum SC pain compared to the control group. However, between the two specific points, LI4 and SP6, there is not a significant difference in reducing postpartum SC pain.

Acknowledgements

We extend our gratitude to Universitas Muhammadiyah Sidoarjo and Universitas Airlangga Surabaya Hospital for their participation in the completion of this research.

References

- Alimoradi, Z., Kazemi, F., Valiani, M., & Gorji, M. (2019). Comparing the effect of auricular acupressure and body acupressure on pain and duration of the first stage of labor: Study protocol for a randomized controlled trial. *Trials*, 20(1), 1–8. <https://doi.org/10.1186/s13063-019-3896-0>
- Asadi, N., Maharlouei, N., Khalili, A., Darabi, Y., Davoodi, S., Raeisi Shahraki, H., Hadianfard, M., Jokar, A., Vafaei, H., & Kasraeian, M. (2015). Effects of LI-4 and SP-6 Acupuncture on Labor Pain, Cortisol Level and Duration of Labor. *JAMS Journal of Acupuncture and Meridian Studies*, 8(5), 249–254. <https://doi.org/10.1016/j.jams.2015.08.003>
- Bushnell, M. C., Čeko, M., & Low, L. A. (2013). Cognitive and emotional control of pain and its disruption in chronic pain. *Nature Reviews Neuroscience*, 14(7), 502–511. <https://doi.org/10.1038/nrn3516>
- Chen, S., Qu, S. H., Zhang, Y., Wen, Z. H., Guo, S. N., Zeng, W. M., Hou, X. S., Jia, Y. F., Xiao, Y., Marmorì, F., Wang, J., & Zhao, J. P. (2019). Impact of acupuncture for allergic rhinitis on the activity of the hypothalamus-pituitary-adrenal axis: Study protocol for a randomized controlled trial. *Trials*, 20(1). <https://doi.org/10.1186/s13063-019-3424-2>
- Chen, T., Zhang, W. W., Chu, Y. X., & Wang, Y. Q. (2020). Acupuncture for Pain Management: Molecular Mechanisms of Action. *American Journal of Chinese Medicine*, 48(4), 793–811. <https://doi.org/10.1142/S0192415X20500408>
- Diane, M. F., & Margaret, A. C. (2009). *Myles Buku Ajar Bidan*. Buku Kedotersn EGC.

- Dini, K. (2013). Operasi Caesar. In *Operasi Caesar* (Issue November 2011, pp. 1–289).
- Gan, T. J., Habib, A. S., Miller, T. E., White, W., & Apfelbaum, J. L. (2014). Incidence, patient satisfaction, and perceptions of post-surgical pain: Results from a US national survey. In *Current Medical Research and Opinion* (Vol. 30, Issue 1, pp. 149–160). <https://doi.org/10.1185/03007995.2013.860019>
- Hsieh, J. C., Tu, C. H., Chen, F. P., Chen, M. C., Yeh, T. C., Cheng, H. C., Wu, Y. T., Liu, R. S., & Ho, L. T. (2001). Activation of the hypothalamus characterizes the acupuncture stimulation at the analgesic point in human: a positron emission tomography study. *Neuroscience letters*, 307(2), 105–108. [https://doi.org/10.1016/s0304-3940\(01\)01952-8](https://doi.org/10.1016/s0304-3940(01)01952-8)
- Joyce, B., & Jane, H. (2014). *Keperawatan Medikal Bedah: Manajemen Klinis untuk Hasil yang Diharapkan*. Salemba Emban Patria. <https://www.elsevier.com/books/keperawatan-medikal-bedah-3-vol-set/black/978-981-272-978-1>
- Kasdu, D. (2003). *Operasi caesar: masalah dan solusinya*. Puspa Swara. <https://books.google.co.id/books?id=CY6iNwAACAJ>
- Paice, J. A., & Ferrell, B. (2011). The management of cancer pain. *CA: a cancer journal for clinicians*, 61(3), 157–182. <https://doi.org/10.3322/caac.20112>
- Pogatzki-Zahn, E. M., Segelcke, D., & Schug, S. A. (2017). Postoperative pain—from mechanisms to treatment. *Pain Reports*, 2(2). <https://doi.org/10.1097/PR9.0000000000000588>
- Reddi, D., & Curran, N. (2014). Chronic pain after surgery: Pathophysiology, risk factors and prevention. *Postgraduate Medical Journal*, 90(1062), 222–227. <https://doi.org/10.1136/postgradmedj-2013-132215>
- Saatsaz, S., Rezaei, R., Alipour, A., & Beheshti, Z. (2016). Massage as adjuvant therapy in the management of post-cesarean pain and anxiety: A randomized clinical trial. *Complementary Therapies in Clinical Practice*, 24, 92–98. <https://doi.org/10.1016/j.ctcp.2016.05.014>
- Schoenwald, S. K., Mehta, T. G., Frazier, S. L., & Shernoff, E. S. (2013). Clinical Supervision in Effectiveness and Implementation Research. *Clinical Psychology: Science and Practice*, 20(1), 44–59. <https://doi.org/10.1111/cpsp.12022>
- Shen, J. (2001). Research on the neurophysiological mechanisms of acupuncture: review of selected studies and methodological issues. *Journal of alternative and complementary medicine (New York, N.Y.)*, 7 Suppl 1, S121–S127. <https://doi.org/10.1089/107555301753393896>
- Sprouse-Blum Ba, A. S., Smith, G., Daniel, B., Ba, S., & Don Parsa, F. (2010). Understanding Endorphins and Their Importance in Pain Management. *Hawaii medical journal*, 69(3), 70–71. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3104618/>
- Tournaire, M., & Theau-Yonneau, A. (2007). Complementary and alternative approaches to pain relief during labor. *Evidence-Based Complementary and Alternative Medicine*, 4(4), 409–417. <https://doi.org/10.1093/ecam/nem012>
- Wu, H. C., Liu, Y. C., Ou, K. L., Chang, Y. H., Hsieh, C. L., Tsai, A. H. C., Tsai, H. Te, Chiu, T. H., Hung, C. J., Lee, C. C., & Lin, J. G. (2009). Effects of acupuncture on post-cesarean section pain. *Chinese Medical Journal*, 122(15), 1743–1748. <https://doi.org/10.3760/cma.j.issn.0366-6999.2009.15.005>
- Yu, J. S., Zeng, B. Y., & Hsieh, C. L. (2013). Acupuncture stimulation and neuroendocrine regulation. In *International Review of Neurobiology* (Vol. 111, pp. 125–140). Academic Press Inc. <https://doi.org/10.1016/B978-0-12-411545-3.00006-7>
- Zhong, Q., Wang, D., Bai, Y. mei, Du, S. zheng, Song, Y. lei, & Zhu, J. (2019). Effectiveness of Auricular Acupressure for Acute Postoperative Pain after Surgery: A Systematic Review and Meta-Analysis. *Chinese Journal of Integrative Medicine*, 25(3), 225–232. <https://doi.org/10.1007/s11655-019-3063-1>