

Role of Infrared Radiation therapy for Perineal Pain Relief and Episiotomy Wound Healing in Postnatal Women

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Abstract: *Background and Need:* An Episiotomy is the surgical cut made in the perineum during the second stage of labor. Episiotomy is performed to enlarge the vaginal opening to facilitate safe and easy delivery with minimal complications and to prevent overstretching and rupture of perineal muscles. Episiotomy wound care begins immediately postpartum and should include both local wound care and pain management. Infrared rays have a therapeutic effect in increasing blood supply, reducing pain and improving wound healing. *Methods:* Electronic search was done and 267 articles were retrieved from databases viz. PubMed, Science Direct and Google Scholar. Considering the inclusion and exclusion criteria, four studies were found eligible for this review that consisted of interventional and Quasi experiment. *Results:* Three Quasi experiment found significant accelerated wound healing and reduced pain. Thus, proving the effective in improving episiotomy wound healing and reducing pain. *Conclusion:* IRR in reducing pain and improving wound healing in patients with episiotomy, and accelerate the healing in women after child birth.

Keywords: Infrared lamp therapy, Infrared light therapy, Infrared radiation, Infrared lamp, Infra-red therapy, IRR, Episiotomy wound healing, Episiotomy wound, Episiotomy, Episiotomy pain, Postnatal mothers, Postpartum mothers

1. Introduction

The most beautiful moment is when a mother gives the child safely. A mother undergoes many changes during pregnancy, both physically and mentally .1,2

The puerperium or postpartum period is the period that begins about one hour after the delivery of the placenta and lasts for the next 6 weeks.3,4 Serious or even fatal problems may occur during this time and therefore, caution should be exercised in order to prevent and assist in the early detection and management of diseases and complications.3,5 Women are therefore at a higher risk of morbidity and mortality as they are more likely to develop puerperal sepsis, episiotomy infections, wound breakdown, urinary and faecal incontinence, and pain and discomfort in the perineum after giving birth. 6,7 Perineal pain is one of the most common causes of maternal morbidity in the early postnatal period in mothers who have had vaginal delivery with episiotomy, and causes much suffering after childbirth. 6,8,9

An episiotomy is a surgical cut in the perineum during the second stage of labour, it can be mediolateral, median, lateral or J shaped.2,10 The goal of episiotomy is to expand the vaginal area so as to facilitate and enhance the safety of delivery while decreasing complications and avoiding overstretching and rupture of the perineal muscles.9,11.

It is believed that episiotomies reduce perineal trauma, minimize postpartum pelvic floor dysfunction by reducing the damage caused to the anal sphincter muscle, loss of blood during delivery and protect against neonatal trauma with the downside being that the pain due to episiotomy often interferes with basic daily activities for the woman such as

walking, sitting, and passing urine and it can also have a detrimental impact on her experiences as a mother.12,13 Most episiotomy healing occurs in the first two weeks, it could take up to six months for the wound to fully recover. The care of an episiotomy wound begins immediately after delivery and should include both local wound care and pain management.5 The wound must therefore be assessed for tenderness, swelling, oedema, discharge and also for localized pain.11 Infrared radiation is generally an effective means of relieving pain.2,8,13 Infrared rays have a therapeutic effect by increasing blood supply and decreasing pain. This will increase the amount of oxygen and 3 nutrients available to the tissues, hasten the removal of waste products, and aid in the reduction of inflammation. When the heat is mild, the sedative effect on the superficial sensory nerve endings almost certainly relieves pain. It also helps with muscle relaxation and the release of muscle spasms caused by injury or inflammation.13,14

Infrared therapy is an appropriate intervention that improves cutaneous vasodilation by releasing chemical vasodilators, histamine, and similar ingredients, as well as having potential direct effects on blood vessels. One of the primary concerns of healthcare staff during the postnatal period should be to provide comfort to the mother, help in pain relief, prevent infection, and enhance episiotomy healing.13

2. Methodology

Search Strategy

Databases used for this review were PubMed, Science Direct and Google Scholar. The following keywords were used: "Infrared lamp therapy", "Infrared light therapy", "Infrared radiation", "Infrared lamp", "Infra-red therapy",

“IRR”, “Episiotomy wound healing”, “Episiotomy wound”, “Episiotomy”, “Episiotomy pain”, “Postnatal mothers”, “Postpartum mother”

Study Selection

Studies were considered for inclusion if they met the following criteria: (a) articles only in English language (b) Women who have undergone a mediolateral or midline episiotomy during vaginal delivery. (c) articles published from 2015 to 2026 and (d) studies done only human subjects. Studies were considered for exclusion if they met the following criteria: (a) articles whose full text was not available (b) articles published before 2015 (c) articles that used IRR for conditions other than episiotomy

Examined Variables

The variables examined in the study were: (a) Frequency of treatment, (b) Duration of treatment, (c) intensity/distance of application, (d) REEDA Scale, (e) Southampton Wound Assessment Scale,

Search of Literature

The literature search through the various electronic databases showed 267 articles, out of which 250 duplicates were ruled out. After initial screening, 9 were excluded and 8 papers remained for abstract review. A total of 4 articles that did not meet the remaining inclusion criteria were excluded, after which only 4 studies that met all the inclusion criteria were considered for further review. (Figure 1)

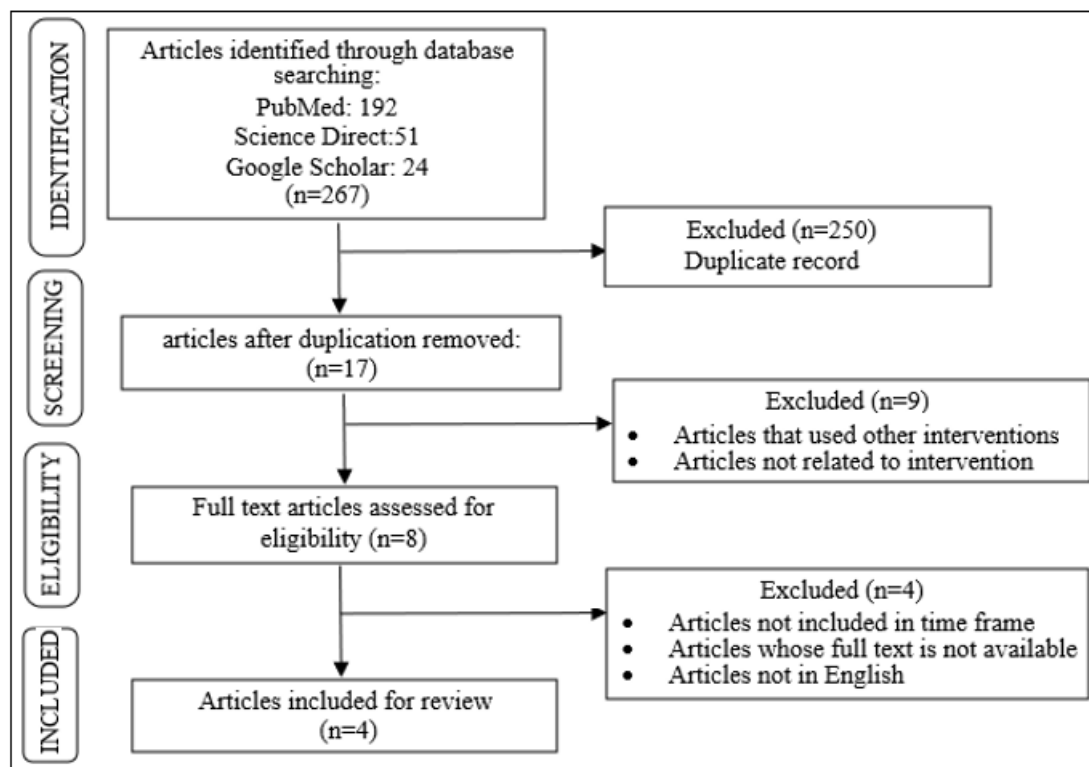


Figure 1: The Prisma Flow Diagram, Illustrating Each Step in the Process to Identify the Final Selection of Studies to be Reviewed

3. Results

Sample

The study samples consisted where postnatal women.

Methodological Quality of Trials

In accordance with the selection and rejection criteria, only 4 studies were finally accepted for the present study (Figure 1).

Interventions

Infrared Radiation (IRR) Treatment Protocol: Infrared radiation therapy is applied to the episiotomy wound and

adjacent perineal area with the mother comfortably in a side-lying or semi-recumbent position with privacy maintained. The infrared lamp is positioned 45–60 cm (18–24 inches) away from the area of treatment and is aimed perpendicular to the perineal region to ensure uniform heat distribution. Treatment is conducted for 15–20 minutes twice a day for 3–5 consecutive days after delivery or until the wound is satisfactorily healed. The dose is adjusted to provide a comfortable sensation of warmth, without excessive heat, discomfort or skin irritation and the treatment area is monitored throughout the session for safety and patient comfort. (Table 1).

Table 1: Brief Description of Included Studies

No	Author & Year	Sample size	Intervention/ Device	Duration, Frequency, Intensity of Intervention	Dependent variables	Evaluation/ reassessment	Results
1	Shukla et al 1 2019 (Quasi experimental al study design)	N=60 Study group (n=30) Control group(n=30)	Infrared lamp therapy and a Routine vaginal care	10min 3days 2times a day	Episiotomy pain wound healing	Post intervention in the evening	Episiotomy pai Reduction in episiotomy pain and wound healing in intervention group compared with control group
2	Balakrishnan et al5 2018 (Quasi experimental al study design)	N=60 Experiment al group (n=30) Control Group (n=30)	Infrared light therapy and Normal vaginal care	10min 3 consecutive days (one session in the morning & other in evening)	Pain and Wound healing	Pre and post-test was done for pain assessment and wound healing	IRR showed a positive effect on reducing pain and improving wound healing
3	Venkadalak shmi et al8 2014 (Experimental study)	N=60 Experiment al group (n=30) Control group (n=30)	Infrared radiation therapy and Routine vaginal care	10mins 3 consecutive days in the morning and evening	Pain and Wound healing	Pain assessment immediately after intervention & every third hour after intervention	The experimental group showed accelerated wound healing and reduced pain
4	Kaur et al9 2015 (Quasi experimental al study)	N=60 Intervention group (n=30) Control group (n=30)	Infrared therapy and Usual vaginal care	Three days	Pain and Wound healing	Beginning and end of the study	Application of infra-red therapy was more effective in improving episiotomy wound healing and reducing pain. .
N: Sample Size; IRR : Infrared radiation							

4. Discussion

Delayed episiotomy healing can affect mental, physical and social well-being of women during postpartum period. With the proper management of episiotomy, the infection can be avoided and the healing process can be hastened up.¹⁵ The main purpose of this literature review was to evaluate the Effectiveness of IRR in reducing pain and improving wound healing in patients with episiotomy. From 4 studies analyzed, 3 were quasi-experimental study design and 1 was experimental study design. They showed that IRR has a positive effect in reducing pain and improving wound healing in postnatal mothers with episiotomy. The pain may be related to a build-up of metabolic waste products in the tissue.¹⁶ The effect of IRR is such that heat application induces vasodilatation and increases blood circulation to the area. This could enhance tissue oxygenation, reduce muscle spasms, and accelerate waste product removal.¹⁵ Muscles relax when tissues are warm, and the relief of pain also facilitates relaxation.¹⁶ A study conducted by Shukla et al, Venkadalakshmi et al, and Kaur et al reported a relief of pain which was measured by NPRS. There was a significant decrease in the mean score of episiotomy pain on 3rd day after intervention.^{1,8,9} By reducing perineal pain, mothers can sit comfortably and maintain an ideal nursing position, which ultimately deepens the mother-child relationship¹⁵, Balakrishnan et al found that the pain mean score among the experimental group was decreased on the fourth day post-intervention. He added that infrared light therapy has a calming effect on the superficial sensory nerve endings and hence pain is reduced.⁵ The biological process of cutaneous vasodilation is influenced by the generation of chemical vasodilators like histamine and other related compounds. An adequate supply of blood is necessary for healing to occur,

and if there is an infection the increased number of white blood cells and the increased exudation of fluid destroy the 14 bacteria.^{16,17} Wound healing was evaluated by the REEDA scale, which assesses inflammatory process and tissue healing in perineal trauma, through the evaluation of five items of healing: Redness, Oedema, Ecchymosis, Discharge, and Approximation of the wound edges. 1 Shukla et al, Balakrishnan et al and Kaur et al reported accelerated wound healing in the experimental group on 3rd-day post-intervention.^{1,5,9} Venkadalalakshmi et al said that on the third day, 10% of the participants in the control group acquired mild infection, whereas none of the people in the experimental group had any infection.⁸ Our body can absorb infrared light up to 2-3 cm deep, which aids in the absorption of moisture, inhibits the growth of bacteria, relaxes tense muscles, and accelerates up the wound and damaged tissue recovery.¹⁸ Limitations of the study were the intervention period was for a shorter duration and the study was conducted in a single setting. IRR can be considered as a treatment for episiotomy wound care during the postpartum period to improve the quality of life of mothers. Future research can be done in different settings with similar interventions or with a larger sample and the period of intervention can be prolonged.¹

5. Conclusion

Infrared Radiation (IRR) therapy appears to be an effective non-pharmacological intervention for managing perineal pain and promoting episiotomy wound healing in postnatal women. The thermal effects of IRR enhance local blood circulation, increase tissue oxygenation, and facilitate the healing process, leading to reduced pain, discomfort, and inflammation at the episiotomy site. Regular application of

IRR therapy may improve maternal comfort, support early mobilization, and contribute to better postpartum recovery. Therefore, IRR therapy can be considered a safe, simple, and cost-effective adjunct treatment for perineal care in postnatal women following episiotomy. Further high-quality studies with larger sample sizes are recommended to strengthen the evidence regarding its long-term effectiveness and optimal treatment protocols.

Declaration of Conflicting Interests

The authors declare no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

The authors received no financial support for the research and/or authorship of this article.

Acknowledgement

We would like to express our gratitude to the staff of the institutional department for their support and guidance.

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