

Effectiveness of Low-level Laser Therapy in Post Caesarean Wound Healing: A Case Report

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Abstract: Caesarean section is a surgical procedure in which the incision is made on the mother's abdomen and uterus to deliver the products of conception.² In India, as per District level household survey 3 (DLHS), CS rate is 28.1% in the private sector and in public sector health facilities is of 12%.⁴ Post LSCS wound infection is not only a foremost cause of prolonged hospital stay but a major cause of the widespread dislike to caesarean delivery in developing countries. We reported case of a female having post caesarean wound gaping. And the effectiveness of low level laser therapy and therapeutic exercises was assessed, after two weeks the patient showed better wound healing and reduction in symptoms of Post natal Depression.

Keywords: Caesarean, wound gaping, Low-level Laser Therapy, REEDA, Edinburgh Depression Scale.

1. INTRODUCTION

The experience of transformation from womanhood into motherhood is a privilege reserved exclusively for women. Pregnancy and childbirth are the wonderful and remarkable moments of life. Giving birth to a child can be one of the most ecstatic experience. Naturally, expectant mothers spend a most of the time thinking about how they will give deliver the baby. Although most people believe that vaginal birth is the best way to deliver, sometimes a Caesarean section (CS) cannot be avoided.¹ Caesarean section is a surgical procedure in which the incision is made on the mother's abdomen and uterus to deliver the products of conception. It is used most often as a prophylactic measure, to alleviate the problem of birth such as cephalo pelvic disproportion, failure to progress in labour or fetal distress.² It is a common delivery procedure in obstetric practice which can be performed as an emergency or elective.³

As per a recent article of WHO report, "At the population level, Cesarean section rates higher than 10% are not associated with a decrease in maternal and newborn mortality rates". The worldwide large difference is observed in CS rates, highest rates being reported in Latin America and the Caribbean region (40.5), followed by Northern America (32.3), Oceania (31.1), Europe (25), Asia (19.2) and Africa (7.3). In India, as per District level household survey 3 (DLHS), CS rate is 28.1% in the private sector and in public sector health facilities is of 12%. This survey shows the share of Cesarean deliveries in institutional births are greater in India, particularly in private sector health facilities.⁴

In addition to the successful delivery of the baby, good quality wound care is a priority for the mother. Wound care is an expensive area of treatment for health care services; with caesarean section wound infections signify a substantial burden to the health system. The prevention of such infections should be of main concern in developing countries, and the global estimates of surgical site infections (SSI) range from 0.5–15%.³ Post LSCS wound infection is not only a foremost cause of prolonged hospital stay but a major cause of the widespread dislike to caesarean delivery in developing countries. Immediate management is very necessary to decrease the possibility of infection, length of the hospital stay and to return for normal function. Many treatments are going on from antibiotics to Infrared radiation, and laser therapy for healing of the post LSCS wound gaping.¹

Low-level lasers have been launched as one treatment modality for wound healing and several indications have been described for their use in wound healing processes. However, the effect in a healthy individual is restricted and the prime indication for laser therapy in wound healing is for individuals or tissues with a compromised state. Laser therapy is an effective therapeutic modality to promote healing of skin wounds.^{5,6,7}

History: This case involved 21 year old female who came to Obstetrics and Gynaecology Department in Pravara Rural Hospital with complaint of loss of fluid at her 36 week of gestation. She had history of increase in Blood pressure during her pregnancy and was on medications for the same. She was immediately admitted in OBGYN ward due to oligohydraminos and for that reason the doctors had planned to conduct her Emergency LSCS prior to her expected date of delivery. After 6 days of her surgery she was discharged, later after a week she noticed white discharge along with blood coming out from her suturing area so she came to PMT for the same. As the suture line was not healing properly again her resuturing was done after 27 days of her LSCS. During this period the discharge which was coming from her sutured area was increasing so the culture sensitivity investigation was done which suggested that there were pus cells and the organism isolated were Acinetobater and Staphylococcus aureus. As there was wound gaping she was referred to Community Physiotherapy Department for the further treatment.

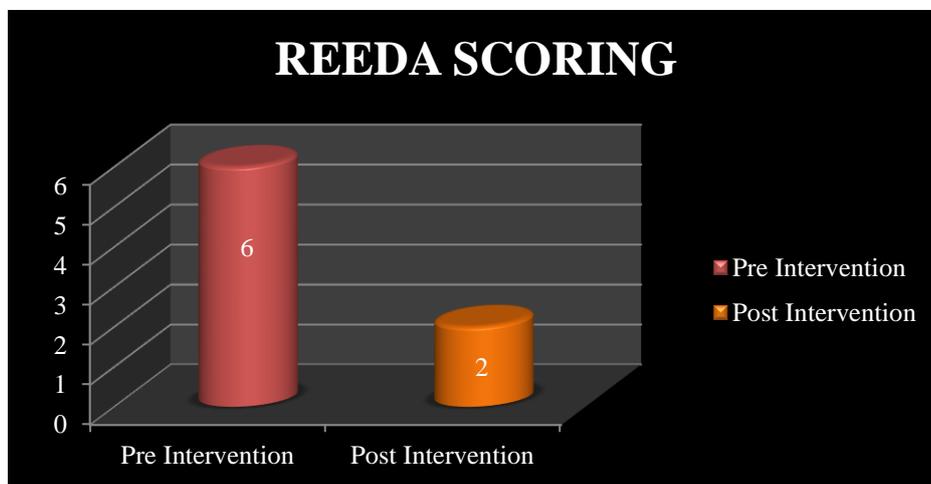
Investigations: For discharge contents culture sensitivity was done which suggested “few pus cells, many gram negative cocci, few gram positive bacilli, and rare gram positive cocci seen. And the organism isolated were Acinetobacter, Staphylococcus aureus”.

Intervention: After the patient was referred to Physiotherapy Department the assessment taken was vitals, general examination was done and the incision site was assessed using REEDA scale and for depression Post natal depression scale was assessed pre and post treatment. Before the intervention informed consent was taken from patient. The intervention given for wound gaping was LASER therapy (GEMI LASER class 38[®]) with intensity of 1J/cm², wavelength 532-680 nm for 5 minutes in continuous mode. Along with that postnatal exercises were given which consisted of deep breathing exercise, coughing and huffing technique to improve pulmonary function and decrease the risk of pneumonia, to prevent post surgical vascular or gastrointestinal complications and oedema active assisted and active movement of the limb, and abdominal massage to peristalsis was given. The patient was encouraged to do movement around the bed using crook lying, bottom lift techniques and knee rolls from side to side, abdominal contraction on expiration, gluteal contraction and early ambulation was taken. Posture correction exercises, isometrics exercises to improve posture and back pain were given. The patient was also taught about breast feeding positions and instructions regarding incisional splinting and positioning for ADLs was taught. For post natal depression relaxation techniques was specified to the patient.⁸ After 2 weeks of intervention outcome measures were reassessed.

2. RESULTS

Table 1.1: Pre-Intervention and Post-Intervention scores of REEDA Scale

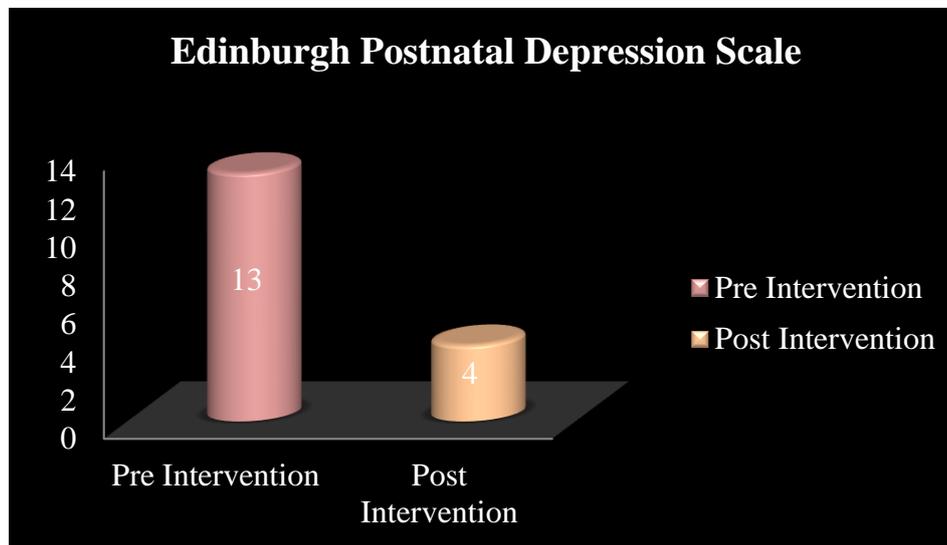
REEDA scale scoring	Redness	Oedema	Ecchymosis	Discharge	Approximation	Total score
Pre intervention	1	0	0	3	2	6
Post intervention	0	0	0	1	1	2



Graph1.1: Pre-Intervention and Post-Intervention scores of REEDA Scale.

Table 1.2: Pre-Intervention and Post-Intervention scores of Edinburgh Postnatal Depression Scale

Edinburgh Postnatal Depression Score	Scoring
Pre Intervention	13
Post Intervention	4



Graph1.2: Pre-Intervention and Post-Intervention scores of Edinburgh Postnatal Depression Scale.

3. DISCUSSION

The purpose of the study was to see the effect of LASER therapy for wound healing and the postnatal exercises for strengthening and prevention in a patient with post caesarean wound gaping. The main aim of this study was to see the effect of Laser therapy on the healing of wound after the surgery. As many treatments are going on from IRR to High-intensity pulsed Laser Therapy there was hardly any study done to see the effect Low-Level Laser Therapy in post caesarean wound gaping. post-intervention outcome assessment showed reduction in REEDA score and the Edinburgh Postnatal Depression scale. Low-level laser therapy has been used in the clinical setting as a corresponding tool for pain relief as well as due to its anti-inflammatory effects and has also been engaged to accelerate the healing process in cases of muscle injury, burns, surgical wounds, and chronic ulcers.⁹ The biomodulatory effects of laser therapy are based on the hypothesis that photon energy is absorbed by cellular photoacceptor molecules, such as oxyhemoglobin, hemoglobin, cytochrome c oxidase, and melanin. Once the photon energy is absorbed, the photoacceptor assumes an electronically excited state and this energy is converted into chemical energy within the cell.¹⁰ The biological effects supported by the therapeutic resources are similar and are related to the decrease in inflammatory cells, increased fibroblast proliferation, angiogenesis stimulation, formation of granulation tissue and increased collagen synthesis. As soon as laser energy penetrates deep into the skin it has quite a few effects, such as an increase in the ATP production and microcirculation, stimulation of the immune system, anti-inflammatory effects, and mostly improved metabolism due to photo-stimulated products that circulate in the blood.¹¹

Postnatal Depression (PND) may also begin in the early postpartum period, but it can start or become obvious, much later too. The mother may feel sad and depressed; she may worry constantly about herself and her baby, feel unable to cope and have a sense of futility and hopelessness. She may be tired to the point of exhaustion but may be unable to sleep. For the postnatal mother's already the physical symptoms such as ankle swelling, loss of hair and a non-dietary weight gain may contribute to depressive thinking, but the delayed wound healing might worsen the situation and land the mother in severe depression.¹² Delayed wound healing can cause emotional damage and contribute to the amplified burden of public expenditure on healthcare. Hence treating the delayed wound and infection should be the main aim.³

Many studies point out significant improvement in re-epithelization of wounds treated with LLLT at doses that range from 1 to 4 J/cm².⁷ The observed results are in agreement with a previous study reported that low-level laser irradiation can be effective in promoting wound healing, and accelerating the caesarean coetaneous wound healing in normal healthy

women. A study by Soheila Mokmeli on Application of Low-Level Laser Therapy after Cesarean Section Low-level laser therapy (LLLT) stated that given post-delivery has no negative effects on lactation, and in fact, helps to modulate metabolic processes and improve wound healing.¹³ Similar effects were achieved with laser therapy applied in a single dose with an energy density of 4 J/cm² and applied four times with an energy density of 1 J/cm², an application of laser therapy in the inflammatory phase was the most important factor in the enhancement of the tissue repair process.⁹ Moreover, another study reported that the wounds in subjects treated with LLLT contracted significantly more than the wounds in the non-treated group, which indicates that LLLT is an effective modality to facilitate wound contraction in patients with wound gaping be used as an adjunct to conventional modes of treatment (dressings and debridement) for the healing of diabetic wounds.¹⁴

4. CONCLUSION

The study concluded that LASER therapy along with the therapeutic exercises rehabilitation program was safe to treat patients with postnatal wound gaping in caesarean section delivery and postnatal depression. Significant beneficial changes occurred after measuring the REEDA Scale and the Edinburgh Postnatal Depression scale after 2 weeks of intervention.

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