



COMPARISON OF PULSED LOW LEVEL LASER THERAPY AND PULSED ULTRASOUND THERAPY IN THE TREATMENT OF EPISIOTOMY

HEMA SWAROOPA.N¹ AND G. DEEPTHI²

¹MPT-1st year student, Department of Urology and obstetric Physiotherapy,
Saveetha College of Physiotherapy, Chennai, India

² Lecturer, Department of Urology and obstetric Physiotherapy,
Saveetha College of Physiotherapy, Chennai, India

ABSTRACT

An episiotomy is an incision made in the perineum (the area of the skin between the vaginal opening and the rectum) during delivery to enlarge the opening for the baby. This incision causes pain and healing will be delayed due to unfavourable perineal environment. In physiotherapy pulsed Low Level Laser Therapy and pulsed Ultra Sound Therapy are more pronounced for enhancing pain reduction favors healing. This study was conducted to compare the effect of pulsed low level laser therapy (LLLT) and pulsed ultra sound therapy (UST) on episiotomy wound healing and pain relief. Twenty subjects were taken from obstetric ward and they were equally divided in to two groups. Group A received pulsed LLLT, Group B received pulsed UST for 7 days. REEDA (Redness, Edema, Ecchymosis, Discharge, Approximation) Scale and (Numeric Pain Rating Scale) was used as a outcome measure. The readings were taken before and after the 7 days of treatment. This study showed statistically significant improvement in healing for both the groups. Group A ($p < 0.0001$), Group B ($p < 0.0001$) for REEDA Scale and significant early pain reduction for Group A treated with pulsed LLLT ($P < 0.0001$), Group B treated with pulsed UST ($P = 0.0011$) for NPRS.

KEY WORDS: Episiotomy, REEDA Scale, NPRS, Pulsed Low Level Laser Therapy, Pulsed Ultra Sound Therapy.



HEMA SWAROOPA.N

MPT-1st year student, Department of Urology and obstetric Physiotherapy,
Saveetha College of Physiotherapy, Chennai, India

Received on : 08.12.2016

Revised and Accepted on : 02-02-2017

DOI: <http://dx.doi.org/10.22376/ijpbs.2017.8.2.b146-150>

INTRODUCTION

A surgical procedure for widening the outlet of the birth canal to facilitate delivery of the baby and to avoid a jagged rip of the area between the anus and the vulva (perineum). During an episiotomy, an incision is made between the vagina and rectum. The usual cut goes straight down and does not involve the muscle around the rectum or the rectum itself. An episiotomy can decrease the amount of maternal pushing, and it may also decrease trauma to the vaginal tissue and expedite delivery of the baby when quick delivery is necessary. However, episiotomies are associated with increased incidence of extensions or tears in to the muscle of the rectum or even the rectum itself. Episiotomies and natural tearing can often be avoided with the use of perineal massage during delivery. Repair of the episiotomy is by simple stitching¹. Episiotomy was 1st introduced in the eighteenth century. Earlier, perineal care emphasized on soothing and supporting the perineum during child birth as evident in writings of Ephidus in the treatise 'Gynaecology' (98-138) AD^{2,3}. During the 11th century, a series of work was published from the 1st medical school at Salerno, Italy. They all emphasized on protecting and preserving the perineum and cried against genital trauma⁴. Episiotomy was first described by Sir Fielding Ould in 1742 and in another 100 years it had become a commonly accepted practice. It was first published in a medical journal in 1810⁵. The use of episiotomy had become routine and unquestioned from 1940 to 1980, when Kitzinger and others in 1981 expressed doubts regarding its effectiveness and the first randomized studies were undertaken by Sheep and colleagues in 1984⁵. Current evidence now shows that episiotomy increases the risk of 3rd and 4th degree tears, wound infections, Post Partum Hemorrhage and does not prevent long term complications such as perineal pain or urinary incontinence. About 80% of all women who delivers vaginally will have an episiotomy⁶. Whether we need an episiotomy will depends on the amount of tissue in your perineum, the size of the baby and clinician's preferences. There are two types of incision- midline and mediolateral. The mother those who have underwent episiotomy will have pain over perineum, difficulty in defecation, sitting and feeding the baby and almost their Acting Daily Living will be affected.

Occasionally the unhealed episiotomy leads to pelvic floor morbidity. In this study two modalities such as Pulsed Low Level Laser Therapy and Pulsed Ultrasound Therapy has been chosen to treat episiotomy, which is more pronounced for healing the tissues. This study compares the effect of pulsed LLLT and pulsed UST in treating episiotomies in terms of tissue healing and pain reduction.

METHODOLOGY

This study was approved by the Institutional ethics committee of the Saveetha University - 015 / 04 / 2016 / IEC / SU on April 2016 - the study was conducted between March 2016 – May 2016. The pilot study was conducted in the Urology and obstetric physiotherapy department of saveetha medical college and hospital. Referral was obtained from obstetrician using convenient sampling method (as the patient comes the odd number were allotted to Group A and even number will allocated to Group B by the research supervisor) twenty subjects were taken from the obstetric ward. After briefing the procedure, the information sheet was given and informed consent was taken. Primiparous / multiparous women aged between 18 -35 years, women who have underwent episiotomy during vaginal delivery, 12 hours after vaginal delivery with episiotomy were included. Those who have perineal tear, infection of the incision, post partum hemorrhage, febrile condition, connective tissue disorder, psychiatric illness were excluded. Group A consists of Ten subjects who received pulsed LLLT- Parameters: Energy density :2J/cm², Pulse rate : 700 HZ, Duration 3 minutes, group B consists of Ten subjects who received Pulsed Ultrasound therapy- Parameters: Mode: Pulsed, Duty cycle : 1:1 ratio Intensity : 0.5W/cm², Frequency : 3 MHZ, Duration: 6 minutes. The outcome measures were noted using Numerical Pain Rating Scale (NPRS) and REEDA scale before and after the 7 days of treatment.

STATISTICAL ANALYSIS

Statistical analysis was done for all the collected data. Paired t-test was used to compare pre-test and post-test values within the groups and unpaired t-test was used to compare the post-test values between the groups

Figure 1
Comparison of pre-test and post-test values of REEDA & NPRS for Group A

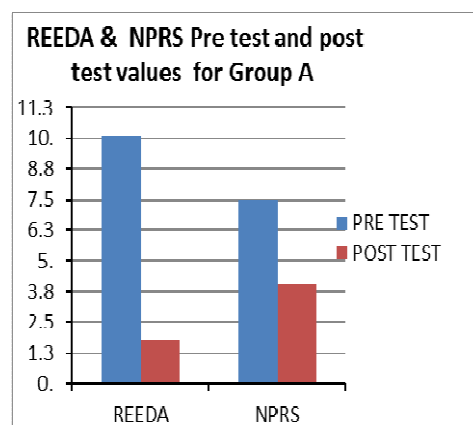


TABLE 1

Pre-test and post-test values of Group A

Group A		Mean	Standard deviation	t- test	p-value
REEDA	Pre-test	10.10	2.42	12.1355	<0.0001
	Post-test	1.80	0.79		
NPRS	Pre-test	7.50	1.08	9.1599	<0.0001
	Post-test	4.10	1.52		

It is observed from above table that mean value of REEDA Scale in pre-test is 10.10 with standard deviation of 2.42. and mean value of post-test NPRS is 4.10 with standard deviation of 1.52. P Value for comparison of pre-test and post-test for REEDA Scale (P <0.0001) And NPRS (P <0.0001)

FIGURE 2

Comparison of pre-test and post-test values of REEDA & NPRS for Group B

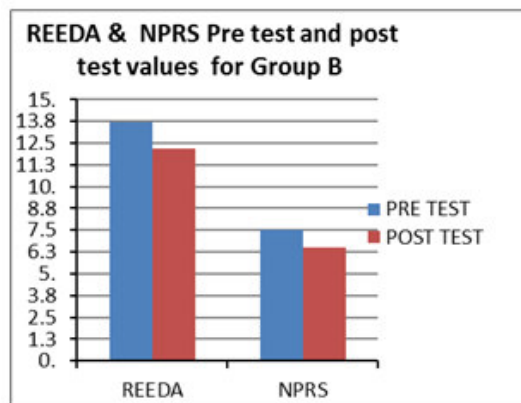


TABLE 2

Pre-test and post-test values of Group B

Group B		Mean	Standard deviation	t- test	p-value
REEDA	Pre-test	13.70	1.25	6.7082	<0.0001
	Post-test	12.20	1.23		
NPRS	Pre-test	7.50	1.27	4.7434	=0.0011
	Post-test	6.50	1.43		

It is observed from above table that mean value of REEDA Scale in pre-test is 13.70 with standard deviation of 1.25. and mean value of post-test NPRS is 6.50 with standard deviation of 1.43. P Value for comparison of pre-test and post-test for REEDA Scale (P<0.0001) and NPRS (P= 0.0011).

Figure 3

Comparison of post-test values of REEDA & NPRS for Group A & B

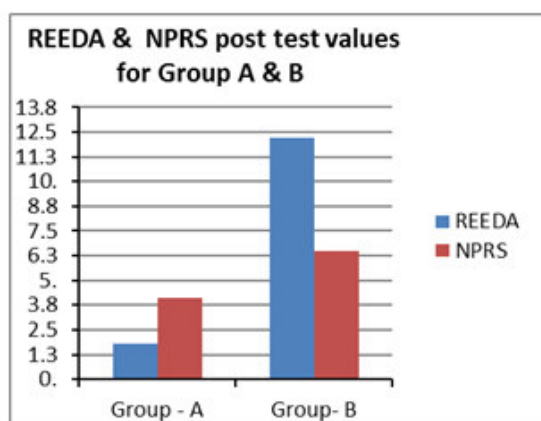


TABLE 3

POST-TEST VALUES OF GROUP-A AND GROUP-B

POST TEST VALUES							
Parameter	Group-A		Group-B		t-test	Significance	
	Mean	Standard deviation	Mean	Standard deviation			
REEDA	1.80	0.79	12.20	1.23	22.5167	<0.0001	
NPRS	4.10	1.52	6.50	1.43	3.6273	=0.0019	

It is observed from above table that mean value of REEDA Scale in Group A post-test is 1.80 with standard deviation of 0.79. and mean value of NPRS is 4.10 with standard deviation of 1.52. P Value for comparison of Group A and Group B post-test values in terms of REEDA Scale ($p < 0.0001$) and NPRS ($P = 0.0019$).

RESULTS

The result of this study was analyzed in the terms of wound healing and pain reduction. The comparison was made between the groups and within the groups. The pre-test and post-test mean value of REEDA Scale for Group A 10.10 & 1.80 and Group B 13.70 & 12.20. This shows that there is significant improvement in wound healing in both the groups ($p < 0.0001$). The pre-test and post-test mean value of NPRS in Group A 7.50 & 4.10. And Group B 7.50 & 6.50. This shows that there is significant improvement in pain reduction in Group A ($p < 0.0001$) than Group B ($P = 0.0011$). The post-test mean value of REEDA Scale and NPRS in Group A is 1.80 & 4.10 and Group B is 12.20 & 6.50. and p value for REEDA Scale and NPRS ($p < 0.0001$), ($p = 0.0019$). The result of this study shows healing is significantly achieved in Group A treated with pulsed LLLT.

DISCUSSION

This study was aimed to find out the effect of healing and pain relieving effect of pulsed LASER and pulsed Ultrasound in treating episiotomy. In physiotherapy practice, LASER & Ultrasound are the two modalities which is used more commonly for healing purpose. The pulsed LASER therapy heals the tissue by increase collagen synthesis, increase macrophage activity, increase fibroblast proliferation, Promotes early epithelization, decrease pain by increasing b-endorphin production, Blocks depolarisation of c-fiber afferent nerve, decrease muscle spasm. Specific studies for use of ultrasound for perineal pain reported only 4 randomized controlled studies⁷⁻⁹. Ultrasound consists of inaudible high frequency mechanical vibration created

REFERENCES

1. Kettle C, Dowswell T, Ismail KMK. Continuous and interrupted suturing techniques for repair of episiotomy or second-degree tears. *Cochrane Database System Rev.* 2012;10-11.
2. Carter E, Daring T. *With child birth through the ages*, Edinburgh: Mainstream publishing company, 1986. :1-3
3. Temkin O. *Soranus' gynecology*. JHU Press; 1956.70--72
4. O, Dowd M J, Phillip E. *The history of Obstetric & Gynecology*. New York. The Parthenox Publishing Group Inc; 2000.:1-6
5. David M. Who invented the episiotomy? On the history of the episiotomy. *Zentralbl Gynakol.* 1993; 115 4: 188-93. German.
6. Sandall J, Soltani H, Gates S, Shennan A, Devane D. Midwife-led continuity models versus other models of care for childbearing women. *The Cochrane Library.* 2013 Aug 21.:20-21
7. McClaren J. Randomized controlled trial of ultrasound therapy for the damaged perineum. *In Clinical Physics and Physiological Measurement* 1984 Jan 1 Vol. 5, No. 1, pp. 40-40.
8. Everett T, McIntosh J, Grant A. Ultrasound therapy for persistent post-natal perineal pain and dyspareunia: a randomised placebo-controlled trial. *Physiotherapy.* 1992 Apr 10;78:263-7.
9. Davidson N. REEDA: evaluating postpartum healing. *Journal of nurse-midwifery.* 1974 Jun 1; 19:6-8.
10. Kindberg S, Stehouwer M, Hvidman L, Henriksen TB. Postpartum perineal repair performed by midwives: a randomised trial comparing two suture techniques leaving the skin unsutured. *BJOG: An International Journal of Obstetrics & Gynaecology.* 2008 Mar 1;115:472-9.
11. Kaufman K 2000 Warm vs. cold sitz baths. *Pre-Cochrane Reviews.*:30-30

when electrical energy converted to acoustic energy through deformation of a piezoelectrical crystal in the transducer. The waves produced through the propagation of molecular collision and vibration¹⁰. Increased molecular motion produces microfriction between the molecules and heat generated from friction causes increase tissue permeability¹¹. The therapeutic ultrasound acts as a reverse piezoelectric effect¹². It improves blood flow, increases skin and cell membrane permeability, alters vascular wall permeability and facilitates soft tissue healing¹³. Grant et al.¹⁴ compared the results of ultrasound with pulsed electromagnetic energy and sham treatment where ultrasound therapy showed improvement in a linear analog scale but was not statistically significant. A randomized placebo controlled trial where ultrasound therapy for persistent postnatal perineal pain and dyspareunia was used showed active therapeutic ultrasound and placebo therapeutic ultrasound both showed reduction in perineal pain, however the study showed that the subjects had bruising effect with the use of ultrasound. However in our study it did not show any bruising effect. The study also showed statistically significant differences in pain and better healing process. The authors concluded that larger trials are needed to clarify the effect of therapeutic ultrasound treatment for perineal pain¹⁴. Further studies can be done with more participants and the modalities can be trialed in treating perineal tear.

CONCLUSION

From this study, it is concluded that pulsed LLLT and pulsed UST are effective in relieving pain and to promote healing Group A treated with pulsed LLLT shows statistically effective in relieving pain and promotes healing.

CONFLICT OF INTEREST

Conflict of interest declared none.

12. Chougala A, Patted S, Mahishale A. Effect of Therapeutic Ultrasound and Maternal Cooling Gel Pad for Perineal Pain Following Vaginal Delivery with Episiotomy. *Journal of Womens Health Care*. 2013 Sep 24;2013. Steen M, Cooper K 1999 A new device for the treatment of perineal wounds. *J Wound Care* 8: 87-90.
13. Dyson M, Franks C, Suckling J. Stimulation of healing of varicose ulcers by ultrasound. *Ultrasonics*. 1976 Sep 30;14:232-6..
14. Punasundri D, Thangaraji RN, Choo B. Perineal cold pads versus oral analgesics in the relief postpartum perineal wound pain. *J SGH Proc*. 2006;15:8-12

Reviewers of this article

Dr. Prathap. S

Assistant Professor, Department of
Physiotherapy,
College of Allied Health Sciences,
Gulf Medical University,
Ajman,UAE



Prof. Srawan Kumar G.Y

Associate Professor, Nalanda Institute of
Pharmaceutical Sciences, Sattenapalli,
Guntur, Andrapradesh, India



Prof. Dr. K. Suriaprabha

Asst. Editor , International Journal
of Pharma and Bio sciences.



Prof. P. Muthuprasanna

Managing Editor , International
Journal of Pharma and Bio sciences.

We sincerely thank the above reviewers for peer reviewing the manuscript