EFFECT OF EXTRACORPOREAL SHOCK WAVE VERSUS LOW LEVEL LASER THERAPY ON POSTNATAL SACROILIAC JOINT PAIN. A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

Background: Postnatal sacroiliac joint (SIJ) pain is a serious health problem because it certainly can limit function and capacity in both work and personal life. Aim: The aim of the study was to compare between the effect of extracorporeal shockwave (ESW) and low level laser therapy (LLL) on Sacroiliac joint pain in postnatal women.

Participants & Methods: Forty, six weeks postnatal women, delivered vaginally suffering from postpartum sacroiliac pain were participated in this study, they were randomly allocated from El–Agouza Police Hospital in Giza, Egypt into two equal groups (A and B). Group A was treated by ESWT therapy, two sessions per week for six weeks, and Group B was treated by LLL therapy, two sessions per week for six weeks. Outcome measures: pain intensity and pain pressure threshold (PPT) were measured by using visual analogue scale (VAS) and digital pressure algometry respectively pre and post treatment (after 6 weeks) for both groups A and B.

Results: There was a statistically significant reduction in VAS (p<0.001), and a significant increase in PPT (p<0.001) in both groups after treatment compared with baseline. When comparing between both groups, there was a statistically reduction in VAS (p<0.001), and a significant increase in PPT (p<0.001), in favour of group A.

Conclusion: Both ESWT and LLLT can be used effectively for relieving postpartum sacroiliac pain, with better effect of ESWT than LLLT.

Keywords: Postnatal period, sacroiliac joint pain, Extracorporeal shockwave therapy; low level laser therapy.

I-INTRODUCTION

Postpartum period is the time from the child birth to about 6 weeks after delivery. Many studies reported that 26% of postnatal women suffer from SIJ pain especially at the first month after delivery with the prevalence of 35%. Its incidence is higher among women who delivered vaginally than those delivered by caesarean section due to mechanical trauma associated with vaginal childbirth [1]. Also, unilateral SIJ pain is more common than bilateral side affection with a ratio of 4:1[2].

Several changes occur during pregnancy including utrine expansion, fluid retention, stretching of abdominal muscles, increased level of relaxin hormone which increases joint and ligament elasticity and subsequently increase biomechanical stress on SIJ leading to micro trauma that activates the stress genes and increases responses of adhesion molecules [1, 3]. These changes required about 6 months after delivery to be resolved resulting in increased pressure on the lumbosacral spine and causing SIJ dysfunction [4].

Symptoms of SIJ pain include: numbness, popping, clicking, or pain in the lower back, buttocks and thighs or groin region [2], that affect quality of life of approximately 80% of patients and disturb their normal activities of daily living as standing, walking and sitting [5].
Sacroiliac joint pain can be cured by medications and physical therapy interventions. The physical therapy interventions include repetitive exercise, manual manipulation, bracing, massage, patient education, aerobic exercises, therapeutic exercises and electrotherapy modalities such as heat, ultrasound, transcutaneous electrical nerve stimulation (TENS), laser, shockwave and pelvic belt [6-8].

Extracorporeal shock wave therapy (ESWT) is a different non-invasive, safe and economical method which becomes nowadays used to treat many acute and chronic musculoskeletal disorders as it decreases pain and inflammation by stimulating revascularization, improvement of cell permeability and reactivating the curing process of connective tissues including tendons and bones [9-11].

Low level laser therapy (LLLT) is a stimulation of tissues with low-intensity and non-thermal irradiation, its effect isn’t heating but photochemical effect [12]. LLL is effective in treating various musculoskeletal disorders as it has analgesic and anti-inflammatory effect. It releases local neurotransmitters charges as serotonin and endorphins and stimulates new cell biosynthesis, especially in the proliferative phase of inflammation [13, 14].

There was a gap in the literature about the effect of shockwave therapy on the postnatal sacroiliac joint pain. To our knowledge, there was only one previous study at this point [7]. Also, there was only one previous research about the effect of LLL on sacroiliac joint pain on both male and female [15]. Till now, there was no previous study investigated which modality of them was more effective in reliving postnatal SIJ pain. So, this study was the first one aiming to compare between the effect of shock wave and low level laser therapy on postnatal sacroiliac joint pain.

II- PARTICIPANTS & METHODS

Study design

This study was designed as a prospective, single blind, randomized, experimental, pre-post-test, controlled trial study. Ethical approval was obtained from the institutional review board at Faculty of Physical Therapy, Cairo University [012/003237]. It was prospectively registered at clinical trials.gov [NTC05015413]. The study followed the Guidelines of Declaration of Helsinki on the conduct of human research. It was conducted between April 2021 and September 2021.

Participants

This study was conducted on forty, six weeks postpartum women delivered vaginally, suffering from sacroiliac joint pain, they were selected from El-Agouza Police Hospital in Giza, Egypt. All participating women were examined firstly by SIJ pain provocation tests (distraction, compression, thigh thrust, FABER and gaenslen’s test) on both sides to determine unilateral or bilateral side affection; all of them must have positive findings in at least three of five of SIJ provocation tests to be included in the study. Also, their ages ranged from 25-40 years and their BMI should be less than 30 kg/m². And, they were excluded from the study if they had any previous surgical operation, deformity, disc lesion, tumour and/or fracture in the lumber vertebra, hip joint pathology, acute pelvic bacterial or viral infection.

Randomization and blinding:

At the beginning of the study, the whole producers were explained for all patients and they signed a written informed consent after clarifying the nature, aim of the study and their right to refuse or decline from the study at any time without prejudices to them, confirming on the security of their data. Women were divided randomly into 2 groups (A or B) by using sealed envelope methods. Written cards with either shock wave therapy or low level laser therapy were put in closed envelopes and another researcher who blinded on the study procedure was asked to choose one card. According to which card was chosen, women were allocated on their group. Group (A) consisted of 20 patients suffering from SIJ pain who received shock wave therapy on the affected SIJ, 2 sessions per week for 6 weeks and, Group (B) consisted of 20 patients suffering from SIJ pain who received low level laser therapy on the affected SIJ, 2 sessions per week for 6 weeks. No dropping out of the patients from the study after randomization, (Figure 1).
Instruments:

• All informations including name, age, address, occupation, weight, height and all measuring variables were recorded at a recording data sheet.

• Body weight and height of each participating women in each group (A or B) were measured by standard weight height scale before starting the treatment procedure to calculate BMI (weight (kg)/height (m²) (kg/m²) [16].

• Shockwave therapy: Gymna shockmaster 500 made in Germany100-240V, 50/60 Hz, and 200VA max, was used for the treatment procedure of women in group (A).

• Low level laser: Gymna, gallium, 905 nm (invisible infrared) made in Germany, was used for the treatment procedure of women in group (B).

Producers:

• Initially, a carful history including personal, present, past, medical, obstetrical and gynaecological history was taken from each women in both groups (A and B ).

• Firstly, before starting the application of shockwave therapy or low level laser therapy for group (A) and group (B) respectively, the nature, purpose of the producers and the benefits of each treatment modality should be explained to all women to gain their confidence and cooperation throughout the treatment sessions.

• Group (A): It consisted of 20 postnatal women who received shock wave therapy by (2,000 shockwaves at 3Hz with energy set to the maximum level tolerable by the patient, energy density = 0.09–0.25 mj/mm², 2 sessions per week, for 6 weeks) [17]. Firstly, the patient was covered by white sheet except the treated area which was cleaned with a piece of cotton immersed in alcohol then each woman was asked to relax in prone lying position with affected sacroiliac joint directed toward the therapist, head was turned to one side and rested on her crossed forearm, ultrasound gel was used as a coupling agent to transmit the shock wave then, the therapist applied a direct pressure by the proximal end of the shock wave head to the skin and the under-lying soft tissue. This mechanism of application sends pressure waves which spreading radially, decreasing the energy related to the square of the distance from the surface. Shock wave produces a vibrant process; the area of the greatest tenderness was treated in a linear design, starting at the point of maximal pain. At the end of the session, shock wave head and the skin of the treated area were cleaned and shock wave machine was turned off [18].

Fig. 1: Flow chart of the study.
• **Group (B):** It consisted of 20 postnatal women who received low level laser therapy with wavelength of 904nm, peak power of 75 mw, frequency of 1000 HZ and dosage of 4 joule/cm², 2 sessions per week, for 6 weeks. Each woman was advised to relax in prone lying position with affected sacroiliac joint directed toward the therapist, head was turned to one side and rested on her crossed forearm, the patient was covered by white sheet except the treated area which was cleaned firstly with a piece of cotton immersed in alcohol. Then, the treated area was divided into 3 shoots expressing the tender points, the laser probe was applied perpendicularly at each point for 30 seconds for 3 times, (about 4.5 minutes as a total time) [8,15].

**Outcome measures:**

• **VAS:** It was used to measure pain intensity for each woman in both groups (A & B). The VAS is usually presented as a 10-cm horizontal line on which the patient’s pain intensity is represented by a point between the extremes of “no pain at all” and “worst pain imaginable.” Its simplicity, reliability and validity, as well as its ratio scale properties make the VAS the optimal tool for describing pain intensity. Each women was asked to mark a point on the line between the extremes that related to her pain intensity [19].

• **Pressure Pain Threshold (PPT):** It was measured by using digital pressure algometry (Wagner model FPX, Germany) which was used to identify the pressure and/or force eliciting a pressure-pain threshold (PPT). It occurs at the minimum transition point when applied pressure (i.e., force) was sensed as pain. It is non-invasive, efficient and reliable tool in the exploration of physio-pathological mechanisms involved in muscle pain syndromes [20]. The PPTs for the sacroiliac joint has apparent face validity since it was used to measure a parameter (pressure pain) that is considered to be indicative for SIJ pain in clinical practice. The patient was asked to lie in prone position with affected sacroiliac joint directed toward the therapist, and the therapist applied pressure perpendicularly on each point of examination and asked patient to say “stop” as soon as a discernible sensation of pain was felt [21].

- The first examination point was marked on the skin 1 cm medially and caudally from the posterior superior iliac spine and 2 cm laterally, medially, cranially, and caudally from the first one. Anatomically, the second, i.e., lateral point, was located nearby the posterior superior iliac spine at the attachment of gluteus maximus muscle to the iliac crest. The third point (2 cm cranially) and the fourth point (2 cm medially) overlaid the erector spinae muscle and the deeper located posterior sacroiliac ligament. The fifth caudal point was located at the attachment of gluteus maximus muscle to faces posterior of the sacrum and posterior sacroiliac ligament (Figure 2). Three measuring times were taken for each point with 15 seconds rest in between. Then, the average of them was calculated [21, 22].

![Fig. (2): A: Pain pressure points of SIJ examination, B: Assessment of pain pressure threshold by digital pressure algometer.](image-url)

**Sample size calculation:**

Sample size calculation was performed using G*POWER statistical software (version 3.1.9.2; Universitat Kiel, Germany) based on data of VAS from pilot study on 5 participants in each group and revealed that the required size of each group was 20. The calculations were made using α=0.05, power 80% and effect size = 0.91.

**Statistical analysis:**

Unpaired t-test was conducted for the comparison of participants’ characteristics between groups. Normal distribution of data was checked using the Shapiro-Wilk test. Levene’s test for homogeneity of variances was
conducted to ensure the homogeneity between groups. Chi-squared test for the comparison of positive test results distribution between groups. Mixed MANOVA was conducted to compare the effect of time (pre versus post) and the effect of treatment (between groups), as well as the interaction between time and treatment on mean values of VAS and PPT between both groups. Post-hoc tests using the Bonferroni correction were carried out for subsequent multiple comparison. The level of significance for all statistical tests was set at \( p < 0.05 \). All statistical analysis was conducted through the statistical package for social studies (SPSS) version 25 for windows (IBM SPSS, Chicago, IL, USA).

### III- RESULTS

- **Participants’ characteristics:**

Table (1) showed the participants’ characteristics of the group A and B. There was no significant difference between groups in the mean age, weight, height, and BMI (\( p > 0.05 \)).

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>MD</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>31.9 ± 5.45</td>
<td>30.6 ± 4.41</td>
<td>1.3</td>
<td>0.82</td>
<td>0.41</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>78.67 ± 7.94</td>
<td>75.3 ± 7.64</td>
<td>3.37</td>
<td>1.36</td>
<td>0.17</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>165.3 ± 8.38</td>
<td>163.7 ± 8.02</td>
<td>1.6</td>
<td>0.61</td>
<td>0.54</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>28.73 ± 0.97</td>
<td>28.07 ± 1.64</td>
<td>0.66</td>
<td>1.55</td>
<td>0.12</td>
</tr>
</tbody>
</table>

SD, Standard deviation; MD, Mean difference; \( p \) value, Probability value

- **Special tests for sacroiliac joint:**

70% to 100% of participants of group A and B showed positive results of special tests of the sacroiliac joint. There was no significant difference in the results of joint distraction test, joint compression test, gaenslen maneuver test, faber test and thigh thrust test between groups (\( p > 0.05 \))(Table 2).

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>( \chi^2 )</th>
<th>( p ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint distraction test</td>
<td>20 (100%)</td>
<td>20 (100%)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Joint Compression test</td>
<td>16 (80%)</td>
<td>14 (70%)</td>
<td>0.53</td>
<td>0.46</td>
</tr>
<tr>
<td>Gaenslen maneuver test</td>
<td>14 (70%)</td>
<td>14 (70%)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Faber test</td>
<td>19 (95%)</td>
<td>19 (95%)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Thigh thrust test</td>
<td>16 (80%)</td>
<td>17 (85%)</td>
<td>0.17</td>
<td>0.67</td>
</tr>
</tbody>
</table>

\( \chi^2 \), Chi squared value, \( p \) value, Probability value

**Effect of treatment on VAS and PPT:**

Mixed MANOVA revealed that there was a significant interaction of treatment and time (\( F (6,33) = 8.18, \ p = 0.001 \)). There was a significant main effect of time (\( F (6,33) = 105.28, \ p = 0.001 \)). There was a significant main effect of treatment (\( F (6,33) = 3.11, \ p = 0.01 \)).

**Within group comparison**

There was a significant decrease in VAS post treatment in both groups compared with that of pre treatment (\( p > 0.001 \)). The percent of decrease in VAS of group A and B was 47.97 and 25.33% respectively (Table 3).

There was a significant increase in PPT of the five points post treatment in both groups compared with that of pre treatment (\( p > 0.001 \)). The percent of increase in PPT of point I., II, III, IV and V of group A was 42.9, 34.24, 34, 35.8 and 42.35% respectively and that in group B was 23.45, 24.85, 23.33, 22.64 and 26.01% respectively (Table 4).

**Between group comparison**

There was no significant difference between groups pre treatment (\( p > 0.05 \)). Comparison between groups post treatment revealed a significant decrease in VAS of group A compared with that of group B (\( p < 0.001 \)). Also, there was a significant increase in PPT of point I., II, III, IV and V of group A compared with that of group B post treatment (\( p < 0.01 \)) (Table 3,4).
Table 3. Mean VAS pre and post treatment of the group A and B:

<table>
<thead>
<tr>
<th>VAS</th>
<th>Group A</th>
<th>Group B</th>
<th>MD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre treatment</td>
<td>7.4 ± 0.82</td>
<td>7.5 ± 1.05</td>
<td>-0.1</td>
<td>0.73</td>
</tr>
<tr>
<td>Post treatment</td>
<td>3.85± 0.67</td>
<td>5.6 ± 0.82</td>
<td>-1.75</td>
<td>0.001</td>
</tr>
<tr>
<td>MD</td>
<td>3.55</td>
<td>1.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of change</td>
<td>47.97</td>
<td>25.33</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SD, Standard deviation; MD, Mean difference; p value, Probability value

Table 4. Mean PPT pre and post treatment of the group A and B:

<table>
<thead>
<tr>
<th>PPT (N)</th>
<th>Group A</th>
<th>Group B</th>
<th>MD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point I</td>
<td>76.09 ± 13.95</td>
<td>74.64 ± 12.35</td>
<td>1.45</td>
<td>0.73</td>
</tr>
<tr>
<td>Pre treatment</td>
<td>108.73 ± 13.81</td>
<td>92.14 ± 17.36</td>
<td>16.59</td>
<td>0.002</td>
</tr>
<tr>
<td>Post treatment</td>
<td>-32.64</td>
<td>-17.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD</td>
<td>-32.64</td>
<td>-17.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of change</td>
<td>42.90</td>
<td>23.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p = 0.001</td>
<td>p = 0.001</td>
<td>p = 0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Point II</td>
<td>79.42 ± 12</td>
<td>74.7 ± 12.47</td>
<td>4.72</td>
<td>0.23</td>
</tr>
<tr>
<td>Pre treatment</td>
<td>106.61 ± 17.57</td>
<td>93.26 ± 14.67</td>
<td>13.35</td>
<td>0.01</td>
</tr>
<tr>
<td>Post treatment</td>
<td>-27.19</td>
<td>-18.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD</td>
<td>-27.19</td>
<td>-18.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of change</td>
<td>34.24</td>
<td>24.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p = 0.001</td>
<td>p = 0.001</td>
<td>p = 0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Point III</td>
<td>81.21 ± 13.66</td>
<td>77.7 ± 10.52</td>
<td>3.51</td>
<td>0.36</td>
</tr>
<tr>
<td>Pre treatment</td>
<td>108.82 ± 17.23</td>
<td>95.83 ± 14.33</td>
<td>12.99</td>
<td>0.01</td>
</tr>
<tr>
<td>Post treatment</td>
<td>-27.61</td>
<td>-18.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD</td>
<td>-27.61</td>
<td>-18.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of change</td>
<td>34.00</td>
<td>23.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p = 0.001</td>
<td>p = 0.001</td>
<td>p = 0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Point IV</td>
<td>85.48 ± 14.17</td>
<td>83.12 ± 10.6</td>
<td>2.36</td>
<td>0.55</td>
</tr>
<tr>
<td>Pre treatment</td>
<td>116.08 ± 17.34</td>
<td>101.94 ± 14.32</td>
<td>14.14</td>
<td>0.008</td>
</tr>
<tr>
<td>Post treatment</td>
<td>-30.6</td>
<td>-18.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD</td>
<td>-30.6</td>
<td>-18.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of change</td>
<td>35.80</td>
<td>22.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p = 0.001</td>
<td>p = 0.001</td>
<td>p = 0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Point V</td>
<td>80.82 ± 7.53</td>
<td>78.66 ± 9.86</td>
<td>2.16</td>
<td>0.44</td>
</tr>
<tr>
<td>Pre treatment</td>
<td>115.05 ± 11.67</td>
<td>99.12 ± 12.78</td>
<td>15.93</td>
<td>0.001</td>
</tr>
<tr>
<td>Post treatment</td>
<td>-34.23</td>
<td>-20.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD</td>
<td>-34.23</td>
<td>-20.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of change</td>
<td>42.35</td>
<td>26.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IV- DISCUSSION

Increased pelvic asymmetry and pelvic position changes occurred during pregnancy are considered risk factors for sacroiliac joint pain in postpartum period [23]. ESWT induced physical alteration of small axons, as it stopped pain impulse conduction, induced chemical changes of pain receptor neurotransmitters, and reduced pain perception [24]. LLL had a direct effect on nerve structures which could increase the speed of recovery from conduction block or inhibit A delta and C fibers transmission [25]. The aim of the study was to compare the effect of shock wave therapy and low level laser on SIJ pain in postnatal women.

Regarding to within groups analysis, the results of the study revealed that there was a significant reduction in VAS and a significant increase in PPT in both groups after treatment compared to pre treatment. These results
showed that both ESWT and LLL were effective in decreasing postpartum SIJ pain. However the decrease of VAS and increase of PPT were significantly greater in the ESWT group.

This finding can be attributed to the effect of ESWT as it reduced pain by neovascularization, tissue regeneration, suppressive effects on nociceptors which affects the gate-control system by blocking it. Increasing blood flow to the tissue leads to decreased muscle tension and adhesions of the tissue [26-27].

Regarding ESWT results, the findings of this study are supported by Elhosary et al. [7] who studied the effect of ESWT on SIJ pain in postnatal women and showed that there was decrease in VAS in the study group who received ESWT added to exercises more than control group.

Also, the results of the study are confirmed by that of Saleh et al. [28] who compared between the effect of ESWT combined with Mulligan exercises versus Mulligan exercises only on functional disability, pain pressure threshold (PPT) and mobility index of the SIJ in patients with SIJD and showed that there was significant increase in PPT, decrease score of Oswestry disability index (ODI) and improve mobility index of study group more than control group.

Moreover, the results of the study come in agreement with that of El-Nahas et al. [17] who examined the effect of shock wave on decreasing postpartum low back pain and showed that there was decrease in VAS and increase in plasma serotonin level after the treatment program in both groups, however this decrease in VAS and increase in serotonin plasma level were more significant in study group who was treated by ESWT and exercises when compared to the control group.

Furthermore, the results of study are in link with Moon et al. [17] who investigated the effect of ESWT on decreasing SIJ pain and reported that there was decreased in numerical rating scale (NRS) and improved in ODI in study group more than control group.

However, the results of the study disagree with Walewicz et al. [29] who examined the effect of ESWT and stabilization training in patients with chronic low back pain and showed that the control group who received sham shock wave had a statistically significant reduction of pain over the ESWT group when was measured after five weeks of treatment. While the ESWT induced more significant improvement than sham shock wave when its effect measured on the long term.

Also, the results of this study aren’t supported with Engebretsen et al. [30] who compared the effect of ESWT treatment with that of supervised exercises in patients with shoulder pain and reported that the supervised exercises were more effective than extracorporeal shockwave in relieving pain and disability index in patients with shoulder pain.

Despite, the inter group superior effect of ESWT, LLL therapy group also has significant intra group improvements. These improvements are attributed to analgesic and anti-inflammatory effect of LLL therapy. Laser therapy uses a process called photobiomodulation which improves cellular metabolism and a decreases pain and inflammation [31].

Regarding to LLL results the findings of this study agree with Ohkuni et al. [15] who studied the effect of low level laser therapy on sacroiliac joint pain and concluded that there was significant improvement in VAS and trunk mobility in LLL group.

Also, these results are confirmed with that of Elbandrawy et al. [8] who compared between the effect of ultrasound and low level laser in treatment of postnatal low back pain and concluded that there was significant reduction of pain intensity in LLLT group more than that of ultrasound group.

In addition, the current results are supported with that of Longo et al. [32] and Soriano and Rios [33] who stated that LLLT was effective in reliving pain, function disability in patient with low back pain.

In contrast, the current findings disagree with that of Ay et al. [34] who studied the effect of (LLLT) on pain and functional ability in patients with acute and chronic low back pain caused by lumbar disk herniation and showed that there was no statistical differences between the LLL and placebo laser groups in all outcome measures in both acute and chronic low back pain patients.

Also, these results aren’t confirmed by Bingöl and Yurtkuran [35] who studied the effect of LLL on shoulder pain and reported that there was no significant improvement in pain, active range, and algometric sensitivity in laser treatment group compared to the control group.

Regarding between group comparison, the current results reported that ESWT is more effective than LLLT in reliving postnatal SIJ pain. These results agree with Király et al. [36] who compared between the ESWT and LLLT.
effects on patients with myofascial pain syndrome of the trapezius and concluded that ESWT and LLLT are effective in relieving myofascial pain however, ESWT had more beneficial effect than LLLT therapy.

Also, Güloğlu [37], compared the effect of ESWT versus LLLT on subacromial impingement syndrome and concluded that both of them are effective treatment methods. However ESWT was more prominent in relieving shoulder pain than LLLT.

In contrast, the current results aren’t linked with li et al. [38] who compared between the effect of extracorporeal shock wave, ultrasound, low-level laser therapy, noninvasive interactive neurostimulation, and pulsed radiofrequency treatment for treating plantar fasciitis and reported that, both ESWT and LLLT are effective treatment methods for plantar fasciitis in short-term and are not superior to each other.

Strengths and limitations:

This is the first study that compares between the effect of ESWT and LLL on postnatal SIJ pain, using an objective method to measure pain pressure threshold. Also, stratification by sex, randomised design and treatments procedures provided by experienced physiotherapists are additional strengths of this study.

However, this study is limited by some factors as it was conducted for short term without following up, pain tolerance differs from one patient to another, physical and psychological status of the patients which may affect the evaluation and treatment outcomes and environmental factors which may affect the patient’s response. Also, this study was conducted without control group. So, further studies are needed to investigate the long term effect of ESWT and LLLT on SIJ pain in postpartum, with follow up. Also, it is suggested to modulate study design to include two comparative study groups and a control one as a reference in the future studies.

V- CONCLUSION

From the previous findings, it can be concluded that both shock wave therapy and low level laser therapy are effective modalities for treating sacroiliac joint pain in postnatal women, with more beneficial effect of ESWT than LLLT.

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Conflict of interest:

The authors have no conflict of interest.

REFERENCES


