

## Effect of Shock Wave Therapy on Postpartum Low Back Pain

DOAA Sh. AHMED, M.Sc.; ENGY M. NAHAS, Ph.D.; FAYIZ F. EL-SHAMY, Ph.D. and  
MAGDA S. MORSY, Ph.D.

*The Department of Physical Therapy for Women Health, Faculty of Physical Therapy, Cairo University*

### Abstract

**Background:** Almost 50 percent of women suffer from lower back pain in the first few months after having baby; Shock Wave Therapy (SWT) is effective in numerous types of musculoskeletal disorders.

**Aim of the Study:** This study was conducted to determine the effect of shock wave therapy in treating postpartum low back pain.

**Patients and Methods:** Thirty volunteers multiparous women suffering from postpartum low back pain for at least 3 months following delivery were participated in this study. They were referred from the Outpatient Clinic of Orthopedic and Outpatient Clinic of Gynecology in Al-Agouza Police Authority Hospital. Their age ranged from 25-35 years old with a mean value  $29.3 \pm 2.4$  years. Parity ranged from (2-3) and their body mass index not exceed  $30 \text{ kg/m}^2$  with a mean value  $(26.11 \pm 1.76) \text{ kg/m}^2$ . The patients were divided randomly into two equal Groups (A & B). Patients in Group A (study group) were treated by shock wave on the lumbar region in addition to abdominal and back exercise together with postural correction training, 2 times per week for 8 sessions. All patients in both Groups (A & B) were evaluated by Visual Analogue Scale (VAS) and plasma serotonin level before starting and after the end of treatment program.

**Results:** Showed a highly significant ( $p=0.000$ ) decrease in VAS and increase in plasma serotonin level after the treatment program in both groups, yet this decrease in VAS and increase in serotonin plasma level was more pronounced and statistically significant ( $p=0.000$ ) in the study group when compared to the control group.

**Conclusion:** Shock wave therapy is an effective modality in alleviating postpartum low back pain.

**Key Words:** Postnatal – Shock wave – Low back pain – Visual analogue scale – Plasma serotonin level.

### Introduction

LOW Back Pain (L.B.P) and pelvic girdle pain are common during pregnancy in many countries.

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**Correspondence to:** Dr. Doaa Sh. Ahmed, The Department of Physical Therapy for Women Health, Faculty of Physical Therapy, Cairo University

The prevalence rates are variable depending on the criteria used for diagnosing the pain. Several studies have shown that approximately 50% of women have low back pain during pregnancy. Often the pain disappears within 1 to 3 months after delivery, however a substantial number of women do not recover after delivery [1].

More than 50% of women complain of some degree of low back pain during pregnancy, and many describe pubic, pelvic, hip, knee and various other joint discomforts. Backache often persists after delivery and may last up to one year. While the etiology of low back pain during pregnancy remains theoretical, three mechanisms regularly are described biomechanical, musculoskeletal, hormonal and vascular [2].

Relaxin is a polypeptide hormone produced by the corpus luteum, implicated in pregnancy-related low back pain. Current theory suggests that high levels of relaxin in the first trimester, which stimulates collagens, may increase joint laxity and promote low back pain. The remodeling of collagen decreases the tensile strength of ligaments, allowing for an increased Range of Motion (ROM) of most joints [3].

These changes may lead to ischemia and metabolic disturbances, which can induce low back pain. This type of pain is generally exertional in nature because of the increased metabolic demands of the structures involved [4].

Back pain after birth is because muscle strain during actual birth. The lower back muscles are used, along with the pelvic muscles, during a vaginal birth. Sometimes this pushing can strain the muscles or ligaments in the lumbar region of the back. Coccyx pain is sometimes the result of the vaginal birth. The coccyx is flexible during

labor and is supposed to move out of the way of the birth passage, allowing an easier delivery. Sometimes, the coccyx is more in the way than out of it and can be injured. These injuries occur mostly from the baby's head, as the baby descends the birth canal. Coccyx injuries can be very painful. Psychological back pain can begin or carry over as a continuation of pregnancy back pain. The subconscious mind might take the opportunity to use the end of pregnancy as a chance to start a psychologically induced pain syndrome (include depression, fatigue, listlessness, pain, malaise and anger) [5].

Extracorporeal shock waves are pressure waves generated outside the body that can be focused at a specific site within the body. ESWT are sound waves that are generated by a source that creates vibration which are then transported through tissue via fluid and solid particles interaction [6]. Extracorporeal Shock Wave Therapy (ESWT) differs from ultrasound wave that it is typically biphasic and has a peak pressure of 0.5 bar, the peak pressure of shock is approximately 1000 times that of ultrasound wave [7].

Shock waves are pulsed acoustic waves characterized by short duration (<1 microsecond) very high pressure amplitudes [8].

Extracorporeal shock wave therapy has been used for the treatment of neumerous musculoskeletal disorders, including calcified tendonitis of shoulder, lateral epiconylities, achilles and patellar tendinopathies, chronic planter fasciitis, osteonecrosis of the femoral head, and delayed union and nonunion of fractures [5]. The rational for the use of ESWT for these conditions is based on stimulation of soft tissue healing by local hyperemia, revascularization. Reduction of calcifications, inhibition of pain to achieve pain relief and persistent healing of chronic inflammatory process [10].

Radial shockwaves are also referred to as Radial Pressure Waves. They are pulses generated by compressed air which converts into acoustic energy. The acoustic pulses are then transmitted into the tissue of the affected area. Each treatment works to increase the metabolic activity at the injury or site of pain, stimulating the body's natural healing process, thus reducing pain [11].

The sources of shockwave generation include electrohydraulic, electromagnetic and piezoelectric principles. The piezoelectric system utilizes a crystalline material, that when stimulated with

high voltage electricity can expand or contract to initiate a pressure wave in the surrounding fluid. The electromagnetic mechanism has a coil that creates opposite magnetic fields when an electric current is applied to them causing a submerged to move, starting a pressure wave within the fluid. The pressure wave is reflected by the parabolic design toward the focal point. Electrohydraulic shockwaves are high-energy acoustic waves generated under water explosion with high voltage electrode [12].

Shockwave in urology (lithotripsy) is primarily used to disintegrate urolithiasis, whereas shockwave in orthopedics (orthotripsy) is not used to disintegrate tissues, rather to induce tissue repair and regeneration [8].

The application of Extracorporeal Shockwave Therapy (ESWT) in musculoskeletal disorders has been around for more than a decade and is primarily used in the treatment of sports related over-use tendinopathies such as proximal plantar fasciitis of the heel, lateral epicondylitis of the elbow, calcific or non-calcific tendonitis of the shoulder and patellar tendinopathy etc. The success rate ranged from 65% to 91%, and the complications were low and negligible [13].

ESWT is also utilized in the treatment of non-union of long bone fracture, avascular necrosis of femoral head, chronic diabetic and non-diabetic ulcers and ischemic heart disease. The vast majority of the published papers showed positive and beneficial effects. Food and Drug Administration (FDA) in United States of America (USA) first approved ESWT for the treatment of proximal plantar fasciitis in 2000 and lateral epicondylitis in 2002. ESWT is a novel non-invasive therapeutic modality without surgery or surgical risks, and the clinical application of ESWT steadily increases over the years [14].

Many interventions such as electrotherapy, manipulation and hydrotherapy for the management of low back pain exist, however most have modest efficacy at best, and there are few with clearly demonstrated benefits once pain becomes chronic. Therapeutic exercises, on the other hand, does appear to have significant benefits for managing patients with Chronic Low Back Pain (CLBP) because of the higher incidence of sacral pain postpartum which may reach to more than 50% of women after delivery [15]. It seems reasonable to use treatment modalities aimed at rapid recovery rate with a minimum number of sessions [16].

Abdominal muscles have many important functions, including breathing, coughing and maintaining posture. The anterior abdominal wall is made up of four muscles-the rectus abdominal muscle, the external and internal obliques, and the transversus abdominal. Low back pain may be partly caused by weak abdominal muscles. If the abdominal muscles are weak, the other structures supporting spine (back muscles) will have to work harder. By developing strong core muscles, mother will be less likely to injure or strain her back muscles. Good posture and developing core strength are few key techniques that may help mother steer clear of back pain [3].

Significant reduced strength of the transversus abdominis, internal oblique, pelvic floor, lumbar multifidus and inadequate coordination of all lumbopelvic muscles is often observed in patients with pregnancy related chronic pelvic pain [13].

The study was conducted to investigate the effect of shock wave therapy in alleviating post-

partum low back pain, so that, this might answer a question about the effect of shock wave therapy on postpartum low back pain.

## Subjects and Methods

Thirty multiparous women suffering from postpartum low back pain (3 months after delivery), were participated in this study. They were selected from the Outpatient Clinic of Orthopedic and Outpatient Clinic Gynecology in Al-Agouza Police Authority Hospital, all participants were free from any gynecological diseases (uterine prolapse, retroversion flexion of the uterus or chronic pelvic pain), spinal diseases such as (spondylosis, spondylolithesis and disc prolapse) and (spinal or pelvic tumor). Their ages ranged from 25-35 years old, their Body Mass Index (BMI) was not exceed  $30\text{kg}/\text{m}^2$  and their number of parity was ranged from 2-3 children. The type of delivery was normal and cesarean section [as shown in (Table 1)].

Table (1): Mean values and standard deviation of physical characteristics of all participants in both Groups (A & B).

Variables	Group (A) $\bar{X} \pm \text{SD}$	Group (B) $\bar{X} \pm \text{SD}$	MD	<i>p</i> -value	<i>t</i> -value	Significance
Age (years)	29.40±2.67	29.20±3.05	0.20	0.850	0.191	NS
Weight (kg)	70.00±9.13	67.73±8.00	2.27	0.476	0.723	NS
Height (cm)	161.60±6.12	161.73±3.86	-0.13	0.944	-0.071	NS
BMI ( $\text{kg}/\text{m}^2$ )	26.68±1.77	25.81±1.97	0.87	0.215	1.270	NS

Practical work was done in the period from July 2016 to May 2017.

All the women were randomly divided into two groups equal in number, study group (Group A) and control group (Group B).

*Study group (Group A):* They were consisted of 15 women, each woman in this group received shock wave therapy for 5 minutes (2000 shocks), 2 times per week for 4 weeks. After that she was asked to perform abdominal strengthening exercise, postural correction exercises and posterior pelvic tilting exercise for 60 minutes 2 times per week for 4 weeks.

*Control group (Group B):* This group consisted of 15 women, each woman in this group was asked to perform abdominal strengthening exercise, pos-

tural correction exercises and posterior pelvic tilting exercise for 60 minutes 2 times per week for 4 week.

*A- Recording data sheet:* All data of each woman in both Groups (A & B) were recorded in a data sheet including: Name, age, occupation, weight, height, BMI, parity, type of delivery, chief complaint, diagnosis, past and present history.

*B- Visual Analogue Scale (VAS):* Graphic rating scale with numerical values that allows continuous data analysis and uses a 100mm line with one anchor (no pain) and the other anchor (worst pain) on the end. Patients were asked to place a mark along the line to denote their level of pain. It is found to be a valid and reliable method for pain assessment. The distance from apart of no pain to the point the patient had made was measured.

*C- Syringes:* They were used to draw blood samples from all women in both Groups (A & B) before and after the treatment course to measure serotonin level. Three ml blood from antecubital vein will be taken before starting treatment sessions and before breakfast for all patients, immediately after end of 8<sup>th</sup> session of shock wave therapy in Group (A & B). A Radioimmunoassay (RIA) method was used for assessment of serotonin level in blood provided by Commercial kits derived from Disorin USA Company in National Research Institute.

*D- Weight-height scale:* It was used to measure the BMI for each woman before starting the study.  $BMI = \text{weight (kg)} / \text{Height m}^2$  (meter square). It is a valid, reliable and standard weight and height scale.

*E- Plinth:* It was used for performing exercises and shock wave sessions on it.

*F- Cotton, alcohol:* They were used for sterilization and cleaning the skin before and after shock wave session and gel was used as a mediator.

*G- Shock wave device:* It was used treatment all women in Group A. It was made by Storz who are world leader in shock wave technology. It is solid unit made with a metal frame and case. The front is a large touch screen. The unit can provide shock wave from 0, 1 to 4 bar and shock rate from 1hz to 17hz. It is connected to electrical main supply 100/240vg, single phase 50/80Hz and 10/5A.

H- Informed consent form.

*I- Mirror:* It was used during postural exercise.

*J- White sheet:* It was used for covering women during session.

#### *Evaluating procedures:*

- 1- All data for each woman in both Groups (A & B) were recorded in a recording sheet before starting the treatment course (4 weeks).
- 2- Weight and height of each mother in both Groups (A & B) were taken before course and BMI was calculated.
- 3- Each woman was asked to sit on arm chair. The antecubital area was cleaned with alcohol. A blood sample 3cm was drawn from the antecubital vein from each mother in both groups by disposable sterile syringe. All samples were collected in the morning before breakfast for all cases in both Groups (A & B) before and after treatment course (4 weeks) and were sent immediately to the Laboratory Centre for analysis.

- 4- Each mother was asked to put a mark on Visual Analogue Scale (VAS) before and after the treatment course (4 weeks) to detect her level of pain.

#### *I- Treatment procedures:*

##### *Study group (Group A):*

Each woman in this group was asked to lie in prone lying position, head turned to one side and rested on the hands, she was covered by a white sheet except the treated area (the painful area). Before starting the treatment, complete explanation was given to patient about what would be done for two groups. Be sure that the patient didn't take certain medications that affect serotonin level in blood such as (morphine, analgesic and antidepressants drugs). Take care that the patient should be free of alcohol intake, caffeine and imbalance caused by other hormones.

After exposing and cleaning the treated area with alcohol, adequate amount of gel was placed on the lower back region, and the machine was adjusted at (2000 shock per session, 8 sessions 2 per week for 4 weeks, energy flux density 0,18mJ per mm square, 2 bars of pressure, frequency 10hz). With using 20mm D-Actor head.

During the treatment the proximal end of the applicator is in contact with skin of the patient and applies a pressure pulse to the skin and the underlying tissue. Pressure waves generated by this mechanism are transmitted radially, decreasing in energy proportional to the square of the distance from the surface. Shock wave application is a dynamic process. With use of the principle of clinical focusing, the area of maximal tenderness was treated in a linear pattern, starting at the point of maximal pain. The mean size of the area of the treatment will be approximately 8cm in width and 8cm in length. The shock wave applicator was slightly pushed against the area to be treated and the start button was pressed on the shock wave gun.

At the end of treatment session, shock wave head as well as the skin of the treated region were cleaned and shock wave machine was switched off.

After finishing the shock wave session, each mother in this group was asked to perform abdominal strengthening exercise, posterior pelvic tilting and postural correction exercises for 60 minutes (2 times/week for 4 weeks) as the following:

##### *Abdominal strengthening exercises:*

*A- Static abdominal exercise:* The mother was asked to lie in crock lying position. The therapist

was stride standing beside her, the inner hand of the therapist under the back of the mother while outer hand above the abdomen. Then therapist asked the mother to contract abdominal muscles firmly and press the lumber region down on his hand, hold then relax. This exercise was repeated for several times.

*B- Hip shrugging exercise:* The mother was asked to lie in half crock lying position. The therapist was stride standing beside her, the inner hand of the therapist was on the anterolateral aspect of knee of the extended limb, while the outer hand above the ankle joint of the mother. The therapist asked the mother to contract her abdominal muscles and draw the extended limb toward her ribs to seem shorter then push it down to seem longer, return to starting position then relax. This exercise was repeated to the other leg and done from standing position and from sitting on outstretched hand for several times.

*C- Lateral flexion of the trunk:* The mother was asked to lie in supine lying position, while the therapist was stride standing beside her, then the therapist asked the mother to contract her abdominal muscles and touch with tips of her fingers the farthest points on her leg while her head follow the movement and her eyes looking behind her shoulder, hold then relax. This exercise was repeated to the other side and also was done from sitting position, stride standing and from side lying position.

*D- Pelvic rotation exercise:* The mother was asked to lie in crock lying position, while the therapist was stride standing beside her, the inner hand was on the lateral aspect of the right knee of the mother while his outer hand was on ankle joint of the mother, then the therapist asked the mother to contract her abdominal muscles and try to touch the left side of the plinth with her flexed knees, hold then return to the starting position and relax. This exercise was repeated to the other side and also was done from half crock lying position.

*E- Trunk rotation exercise:* The mother was asked to sit on a stool putting her hands around her waist while the therapist was stride standing in front of the mother, then the therapist asked the mother to contract her abdominal muscles and turn her trunk to the right side as much as she can while her head follow the movement and her eyes looking behind her shoulder, hold then return to the starting position and relax. This exercise was repeated to the other side and also was done from standing

position, prone kneeling position and crock lying position.

*F- The antero-posterior flexion of the trunk:* The mother was asked to lie in supine lying position, while the therapist was stride standing beside her, then the therapist asked the mother to do the following:

- Contract abdominal muscles and raise her head and look at her feet, hold then relax.
- Contract abdominal muscles and raise her head, her shoulders and look at her feet, hold then relax.
- Contract abdominal muscles and raise her head, her shoulders and come to sitting position with outstretched hands, hold then relax.
- Contract abdominal muscles and come to sitting position while her hands crossed on her chest, hold then relax.
- Repeat the previous exercise while her hands under her head then put them in u shape.
- The mother was asked to contract abdominal muscles and raises one lower limb up, hold then relaxes.
- This exercise was repeated to the other lower limb then to both lower limbs, hold then relax.
- The last step of this exercise, the mother was asked to contract abdominal and come to sitting position with outstretched hands while raising both lower limbs up, hold then relax.

*- Posterior pelvic tilting exercise:*

This exercise was done from crock lying, standing against the wall and from prone kneeling position. From crock lying position:

The mother was asked to lie in crock lying position while the therapist was stride standing beside her. His thumbs were on the anterior superior iliac spines of the mother and other fingers were fanning on the lateral aspect of her pelvic. Then the therapist asked the mother to contract her glutei, contract her abdominal muscles and press her lumber region on the plinth, hold then relax.

*- Postural correction exercise:*

This exercise was done from crock lying position, supine lying position and from standing in front of mirror as the following:

*From standing in front of the mirror:*

The mother was asked to stand in erect position in front of mirror while the therapist was stride standing beside her. The mother was asked to chin

in, then take deep breath from her nose and open her chest, contract abdominal muscles, contract glutei, extend her knees, feel that her body weight is transmitted to the lateral malleolus, to the lateral border of the feet, then to the ball of the big toe, hold then relax.

- Control group (group B):

Each woman in this group was asked to perform only abdominal strengthening exercises, posterior pelvic tilting exercises and postural correction exercises for 60 minutes 3 times/week for 4 weeks.

**Results**

The mean, SD, MD and percentage of improvement in pain sensation in the study and control group pre and post-treatment. The mean  $\pm$  SD of VAS scores for the study group pre-treatment was  $(8.07 \pm 1.25)$  and it was  $(1.96 \pm 1.12)$  post-treatment while percentage of improvement in pain sensation after treatment was 75.79%. On the other hand, the mean value  $\pm$ SD of VAS scores for the control group pre-treatment was  $(8.73 \pm 1.18)$  and it was  $(3.90 \pm 1.39)$  post-treatment while percentage of improvement in pain sensation after treatment was 55.33% (Table 2) & Fig. (1).

Table (2): The mean values and SD of (VAS) scores and percentage of improvement before and after treatment course for the study group (group A) and control group (group B).

Statistics	Group (A)		Group (B)	
	Pre-treatment	Post-treatment	Pre-treatment	Post-treatment
$\bar{x}$	8.07	1.96	8.73	3.90
$\pm$ SD	$\pm 1.25$	$\pm 1.12$	$\pm 1.18$	$\pm 1.39$
MD	6.11		4.83	
% of improvement	75.71%		55.33%	
t-value	22.934		15.930	
p-value	0.000		0.000	
Significance	S		S	

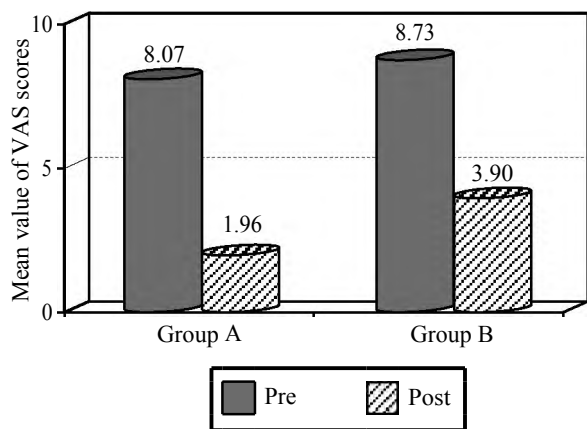


Fig. (1): The mean value VAS scores pre and post-treatment for study and control Group (A & B).

On comparing the mean values of (VAS) in patients of the study Group (A) to that of the control Group (B), a highly statistically significant ( $p=0,000$ ) decrease in the study group was found.

The percentage of decrease in VAS in the study Group (A) after treatment was 75.71% and in control Group (B) was 55.33% after treatment program as shown in Fig. (2).

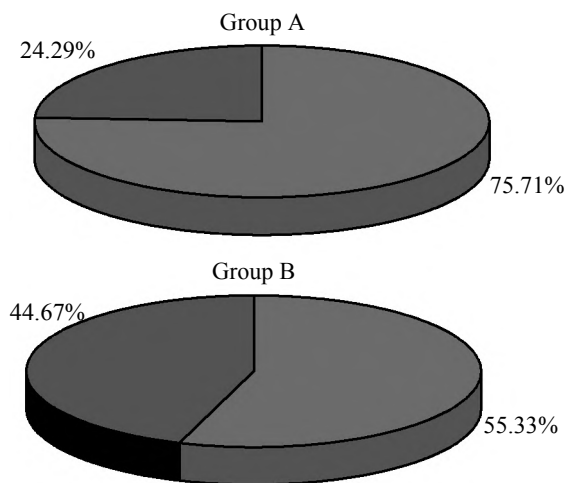


Fig. (2): The percentage of improvement in pain sensation after treatment in both group (Group A & B).

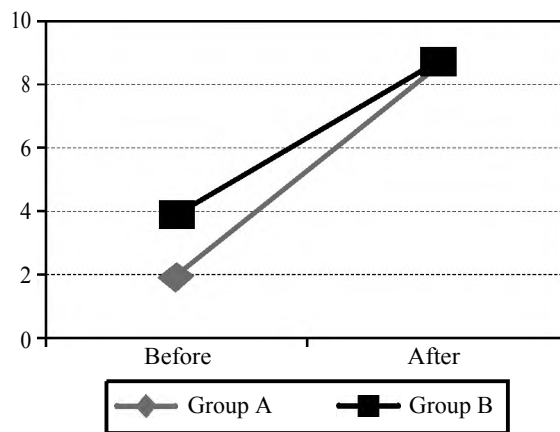


Fig. (3): Average of improvement of mean value of (VAS) in both groups.

Table (3): Mean value and SD of plasma serotonin level and percentage of increase in plasma serotonin level before and after treatment course for the study and control Group (A & B).

Statistics	Group (A)		Group (B)	
	Pre-treatment	Post-treatment	Pre-treatment	Post-treatment
$\bar{x}$	118.77	252.36	116.95	166.26
$\pm$ SD	$\pm 19.55$	$\pm 30.71$	$\pm 17.29$	$\pm 30.22$
MD	-133.59		-49.31	
% of improvement	112.48%		42.16%	
t-value	-12.713		-5.879	
p-value	0.000		0.000	
Significance	S		S	

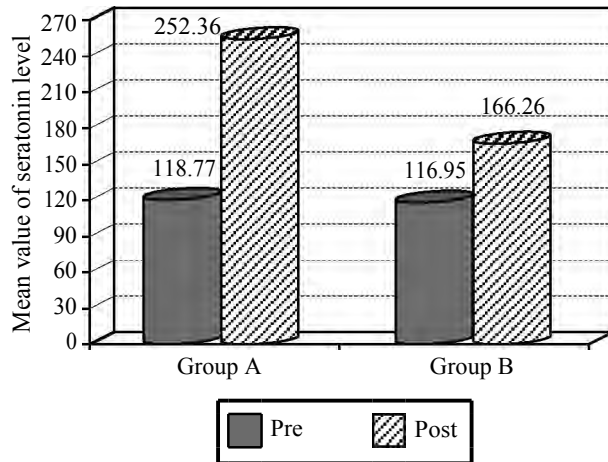


Fig. (4): The serotonin level pre and post-treatment for study and control Groups (A & B).

Table (3) showed that the mean, SD, MD and percentage of increase in plasma serotonin level in the study group and control pre and post-treatment. The mean  $\pm$  SD of plasma serotonin level for the study group pre-treatment was  $(118 \pm 19.55)$  and it was  $(252.36 \pm 30.71)$  post-treatment while percentage of increase in plasma serotonin level after treatment was 112.48%. On other hand, the mean value  $\pm$ SD of plasma serotonin level for the control group pre-treatment was  $(116.95 \pm 17.29)$  and it was  $(166.26 \pm 30.22)$  post-treatment while percentage of increase in plasma serotonin level after treatment was 42.9% as shown in Fig. (4).

Plasma serotonin level before starting and after the end of treatment for both Groups (A & B) as shown in Fig. (5).

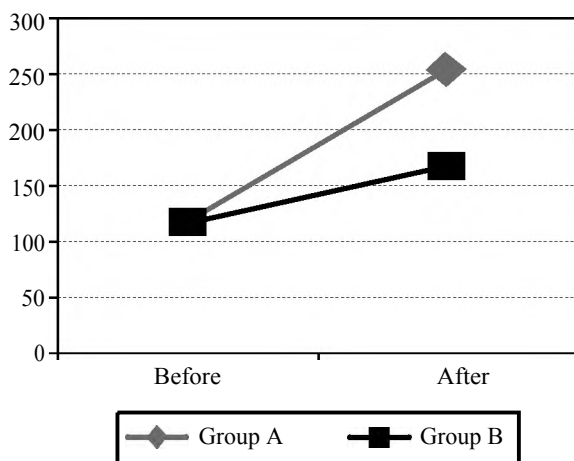


Fig. (5): Average of improvement of mean value of serotonin plasma level in both group.

By comparison between 2 groups it was found the mean value of serotonin level was highly increased in the study group after treatment greater than control group Fig. (5). This means that, shock

wave combined with strengthening exercises for abdominal muscles, posterior pelvic tilting and postural correction exercises were better than using strengthening exercises for abdominal muscles, posterior pelvic tilting and postural correction exercises alone in relieving low back pain post-treatment.

### Discussion

Low Back Pain (LBP) and Posterior Pelvic Pain (PPP) previously were considered one entity, and past research has grouped these two conditions under the single classification of "LBP". More recently, they have been discretely described and measured, and it is now evident that they require individual consideration for diagnosis and management [2].

Posterior pelvic pain is four times more prevalent than lumbar pain in pregnancy. It is a deep pain felt below and to the side at the waist line, and/or below the waist line on either side across the tailbone (sacrum). This type of pain may be experienced on one or both sides. It can extend down into the buttock and upper portion of the posterior thighs, and does not usually radiate below the knees. It can be associated with pubic pain. The pain does not quickly resolve with rest and morning stiffness may also be present [2].

Radial Shock Wave Therapy (RSWT) is a very effective alternative to conservative treatment in lower back pain. RSWT combined with the exercise program relieved chronic low back pain [17].

The results of this study came in agreement with the results of Rompe JD et al., 2010 who studied the effect of Extracorporeal Shock Wave Therapy (ESWT) on medial stress syndrome. The results of his study showed that Radial shock wave therapy as applied was an effective treatment for MTSS (Medial Tibial Stress Syndrome) [18].

The results of the study came in agreement with the results of Furia JP et al., 2009 who studied the effect of low energy ESWT as a treatment for greater trochanteric pain syndrome. The results showed that ESWT is a safe and effective treatment for greater trochanteric pain syndrome [19].

The results of the study were confirmed with that Zimmermann et al., 2009 who concluded that "the application of low energy extracorporeal shock wave showed statically highly significant improvement of pain [20].

The results of the study were in line with Marwan et al., 2014 who reported that three sessions

of extracorporeal shock wave therapy is effective in relieving pain and pain didn't recur during one year follow-up period [21].

The study of this study were in line with Young, 2007 who studied that exercise is one of the most effective strategies for boosting serotonin levels, physical activity and deep breathing exercise may increase the rate at which serotonin neurons in the brain fire, which stimulate the production of the mood elevating chemical [22].

The results of this study were in line with Ko J.K., 2007 who concluded that strengthening exercise for lower back would be an effective nursing intervention [23].

The results of this study came in agreement with Chung et al., 2015 who concluded that "all the core strength training strategies assist in alleviation of chronic low back pain [24].

The results of this study came in agreement with Joan JH et al., 2012 who concluded that "the ESWT in patients with Myofascial Pain Syndrome (MPS) in trapezius muscle are as effective as Trigger Point Injection (TPI) and Transcutaneous Electrical Nerve Stimulation (TENS) for the purpose of pain relief and improving range of motion" [25].

Also in agreement with the results of the present study, Seco J et al., 2011 had concluded that patients with acute low back pain and leg pain who were treated with shock wave had similar results with patient who was treated with ultrasound, traction and laser [17].

In summary, this study concluded that using shock wave combined with strengthening exercises for abdominal muscles, posterior pelvic tilting and postural correction exercises is much better than using strengthening exercises for abdominal muscles, posterior pelvic tilting and postural correction exercises alone in relieving low back pain after delivery.

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## تأثير العلاج بالموجات التصادمية على آلام أسفل الظهر بعد الولادة

تهدف هذه الدراسة إلى تقييم مدى تأثير الموجات التصادمية في علاج آلام أسفل الظهر لدى السيدات بعد الولادة. تم إجراء هذه الدراسة على ثلاثين سيدة متطوعة تعانين من آلام أسفل الظهر بعد الولادة وكانت أعمارهن تتراوح ما بين ٢٥-٣٠ عاماً وعدد مرات الولادة بين ٢-٣ مرات ولا يزيد معدل كتلة الجسم لأى منهن عن ٣٠ كجم/م<sup>٢</sup>. تم إختيارهن من العيادة الخارجية لقسم النساء والتوليد بمستشفى الشرطة بالعجوزة وقد تم تقييم المريضات عشوائياً إلى مجموعتين متساويتين في العدد (أ & ب) تم علاج المريضات في المجموعة أ (مجموعة الدراسة) بواسطة الموجات التصادمية على أسفل الظهر بالإضافة إلى تمارين تقوية عضلات البطن والظهر مع تمارين تعديل القوام لعدد ٨ جلسات بواقع جلستين أسبوعياً لمدة أربع أسابيع، بينما تم علاج المريضات في المجموعة ب (المجموعة الضابطة) بواسطة تمارين تقوية عضلات البطن، والظهر مع تمارين تعديل القوام لنفس الفترة الزمنية، وقد تم تقييم المريضات في المجموعتين عن طريق مقياس شدة الألم وكذلك قياس نسبة السيروتونين في الدم قبل بداية وبعد الإنتهاء من البرنامج العلاجي (٨ جلسات) وقد أسفرت النتائج عن وجود نقص ذو دلالة معنوية في الإحساس بشدة آلام أسفل الظهر وكذلك زيادة في نسبة السيروتونين في الدم بعد البرنامج العلاجي للمريضات في كلتا المجموعتين غير أن الزيادة في نسبة السيروتونين والنقص في مقياس شدة الألم كان أكثر وضوحاً ودلالة في مجموعة الدراسة عند مقارنتها بالمجموعة الضابطة مما يمكن معه إستخلاص أن الموجات التصادمية لها تأثير فعال في علاج آلام أسفل الظهر لحالات ما بعد الولادة ويمكن التوصية بإستخدامها كعلاج فعال مثل هذه الحالات كبديل للوسائل العلاجية الأخرى مثل العقاقير التي قد ينتج عنها آثار جانبية خطيرة.