Evaluation of Lumbo-Pelvic Stabilizing Exercises in the Treatment of Backache after Normal Labour.

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Abstract: This study was designed to evaluate the effect of Lumbo-pelvic stabilizing exercises in the treatment of post partum backache. Twenty volunteers women diagnosed with post partum backache, their ages ranged from 25-35years, they were delivered normally and received stabilizing exercises for lumbo-pelvic muscles (24 sessions), 3 sessions per week for 8 week. All women were evaluated before and after the end of the treatment progrmme using visual analogue scale for pain assessment and Oswestry disability questionnaire for the assessment of functional disability The obtained results showed highly statistically significant decrease in pain intensity.($p<0.001$), and improve the functional disability ($p<0.01$) at the end of the study Accordingly, it could be concluded that lumbo-pelvic stabilizing exercises appears to be effective in the management of post partum backache.
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1. Introduction:

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 (Darryl et al., 2007).

The classical hypothesis of low back pain postulates that weight gain experienced during pregnancy results in postural changes that produce pain. Due to the anterior displacement of the center of gravity of the trunk and abdomen, women may unconsciously shift their head and upper body posteriorly over their pelvis, inducing hyperlordosis of the lumbar spine. This shift generates stress on intervertebral disks, facet joints and ligaments, promoting joint inflammation. Inflammation and distension of the joint capsule create pain and increase sensitivity to movement (Macevilly and Buggy, 1996).

On the 917 women, who entered the study, 817(89%) responded completely, the presence of back pain at the time of delivery was reported by 67% of these. At follow up, 63% stated that they had no back pain, whereas 37% still had some. Although 26% were in the “much better” group, 4% were in the ”somewhat improved” group, as compared to immediately after delivery,7% of the women said they had serious back pain 18 months after delivery. The pain was most often in the posterior pelvic and lumbar areas and was, on average, 3.2 on the visual analogue scale, which ranged from 0= no pain to 10=severe and intolerable pain (Ostgaard and Andersson, 1992).

Back pain after the birth can come from several sources. Muscle Strain during the actual birth can occur. 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 a 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) (Ostgaard and Andersson, 1992).

Recent research has focused on the importance of activation of muscles for motor control and stability of the lumbo-pelvic region (Vleeming et al., 1997).

Specific stabilizing exercise program in women with post partum pelvic pain improved functional status and reduced pain (Stuge et al., 2004).

The stabilizing sequence includes strengthening of the segmental muscles, neutral spine stabilization and finally strengthening the prime movers. The inter segmental muscles act as tonic or postural stabilizers of the spine, tending to be fatigued and atrophied after spinal injury. Therefore initial stabilization exercises are directed toward these muscles, which can control individual segmental mobility. The next phase is the stability training; it involves direct and indirect strengthening of muscle groups in neutral spine posture. Training begins with exercises designed to locate the neutral spine in a variety of body positions as prone lying, sitting and jumping which increase the awareness of lumbar and pelvic motion .This is followed by exercises of extremities while maintaining neutral spine and later with addition of resistance to the extremities, either manually or with weights. These exercises are performed slowly with the emphasis on precise pelvic control. This will facilitate neuromuscular coordination, enhance endurance, strength and also emphasize the smaller postural stabilizer (Weinstein et al., 1998).

Finally, strengthening the prime movers. Strengthening of the large and more superficial muscles of the trunk. These muscles are not only involved in moving the spine, but are also responsible for transferring load directly between the thoracic cage and the pelvis .The main function of the global muscles is to balance the external loads applied to the trunk so that the residual forces transferred to the lumbar spine can be handled by the local muscles (Britt et al., 2004).

The stabilization exercises were created to address the following goals: to focus training on particular muscles that are important for increasing stability, to represent the full range of potential levels of difficulty and to provide clear increase in difficulty based on increasing moment to the muscles stabilizing the lumbar spine. Lumber stabilization exercise should focus on the transverses abdominis and multifidus, because these muscles are the primary stabilizers of the spine (Wohlfart et al., (1993).

Contraction of the transversus abdominis significantly decreases the laxity of the sacroiliac joint in non pregnant women, and it might therefore be better to postpone the exercises until the post partum period (Richardson et al., 1999).

The co-contraction of the transversus abdominus and multifidi muscles occurred prior to any movement of the limbs. This suggests that these muscles anticipate dynamic forces, which may act on the lumbar spine and stabilize the area prior to any movement. They also showed that the timing of co-ordination of these muscles was very significant, and that back injury patients were unable to recruit their transversus abdominus and multifidi muscles early enough to stabilize the spine prior to movement. Furthermore, the multifidi muscle showed poor recruitment in back injury patients, again showing how the recruitment of these deep trunk muscles is very important (Saal and Saal 1989).

Mike et al. (2009) defined dynamic stabilization as the stability of the patient to be active through the day without increasing symptoms, a corner stone of this approach is to make every attempt to work the patient as vigorously as possible without increasing symptoms. As the patients progress in their ability to control the spinal functional position during various exercises, there should be a corresponding increase in the ability to perform activities of daily living without increasing symptoms.

The stabilizing sequence includes strengthening of the segmental muscles, neutral spine stabilization, and finally strengthening of the prime movers. The inter-segmental muscles act as tonic or postural stabilizers of the spine, tending to fatigue and atrophy after spinal injury. Therefore initial stabilization exercises are directed toward these muscles, which can control individual segmental mobility. The next phase is the stability training involves direct and indirect strengthening of muscle groups in neutral spine posture. Training begins with exercises designed to help locate the neutral spine in a variety of body positions such as prone, lying, standing, sitting and jumping which increases the awareness of lumbar and pelvic motion. This is followed by exercises of the extremities while maintaining neutral spine and later with addition of resistance to the extremities, either manually or with weights. These exercises are performed slowly with the emphasis on precise pelvic control. This will facilitate neuromuscular coordination, enhance endurance and strength, and also emphasize the smaller postural stabilizers (Weinstein et al., 1998).

Because of the higher incidence of post partum backache which may reach to 37% of women after normal labour. It has a profound psychosocial impact not only on women but also, on their families as it has an effect on their performance of the daily living activities and decrease their ability to maintain an independent life style, so it adversely affects all aspects of life. Accordingly, it seems to be important to find out a safe effective exercises program to treat post partum backache.

2. Subjects, Material and Methods

Subject's Criteria: -

This study was carried out on 20 patients, their ages ranged from 25-35 years old, their BMI ranged from 30-35 kg/ m2 and the number of parity

not more than three times. All patients were referred from orthopedic after examination at least two months after delivery. None of the patients took any medication or specific treatment for low back pain during the study. Patients were free from any diseases which cause low back pain (disc prolapse, spondylosis,….) confirmed by X- Ray Patients were delivered normally without epidural anesthesia. They were treated by stabilizing exercises, three sessions per week for eight weeks (24sessions), and repetition 10-15 of each exercise. The duration of this study was six months.

Instrumentation:

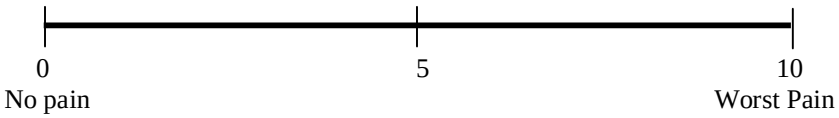
1) Weight –height scale to estimate the patient body weight and height to calculate the body mass index (BMI) for each patient.
2) Visual Analogue Scale (VAS) for measuring pain intensity in clinical practice.
3) Oswestry disability questionnaire for measuring functional disability

Methods: -

Each patient in this study was instructed about the different evaluation and treatment procedures to gain her confidence and cooperation through the study. Methods for patient evaluation were done before starting and after the end of the treatment (2months) for all patients participated in this study as following: A detailed medical and gynaecological history was taken from each patient including number of deliveries (not more than 3 times) , age, weight and history of neurological disorder.

Assessment of low back pain severity: Pain assessed by Visual Analog Scale (VAS).

VAS is a scale that allows continuous data analysis and uses a 10cm line with 0 (no pain) and 10 (worst pain) on the other end. Patients were asked to place a mark along the line to denote the level of pain (Scrimashaw and Maher, 2001).



(Visual analogue scale)

Assessment of functional disability:

Functional disability of each patient was assessed by Oswestery disability questionnaire. It is valid and reliable. It consists of 10 multiple choice questions for back pain; patient select one sentence out of six that best describe her pain, higher scores indicated great pain

The treatment procedure:

Each patient performed stabilizing exercises program every other day for 2 months (24sessions), repetition of each exercise between 10-15 times (10 times in first 12 sessions after that they were 15 times at others 12 sessions)and 3 session per week. Lumbo-pelvic stabilizing exercises training program consisted of abdominal hollowing ,quadruped abdominal hollowing, ,unilateral abduction ,unilateral knee raise, bilateral knee raise ,unilateral heel slide , bilateral heel hover and bilateral heel slide

Statistical analysis:

The collected data were statistically analyzed by using t-test for comparing before and after treatment programme. Significance level of 0.05 was used throughout all statistical tests within this study; p-value <0.05will indicate a significant result, p-value<0.01 will indicate a highly significant result (Bendate and Piersol, 1991).

3. Results

In this study twenty patients were suffering from post partum backache, they received stabilization exercises. Medical and gyaecological history had been taken at the beginning of the study and after the end (after 2 months) of the treatment programme. All data had been collected and statistically analyzed.

I-Physical characteristics of the patients

The mean values of patients' age, weight, height and BMI were 28.35±1.84 yrs, 80.20±1.88 Kgs, 155.85 ±3.01Cms and 32.95 ±1.50Kg/m2 respectively.

II- Pain Severity.

As observed in table (1) the mean value of pain severity for patients before starting the study was 7.30±1.08 and it was decreased after the end of the treatment programme to3.15±1.18with mean difference of 4.150. The difference is highly statistically significant (p<0.001) with percentage of 56.85% improvement in pain severity at the end of the programme (Fig.1).

	Pre-treatment	Post-treatment
X	7.30±1.08	3.15±1.18
Mean diff	4.150	
% of change	56.85%	
T-Value	21.208	
P-Value	0.001	
Significance	High significance	

Table (1): Mean value of pain severity at pre and post treatment for patients.

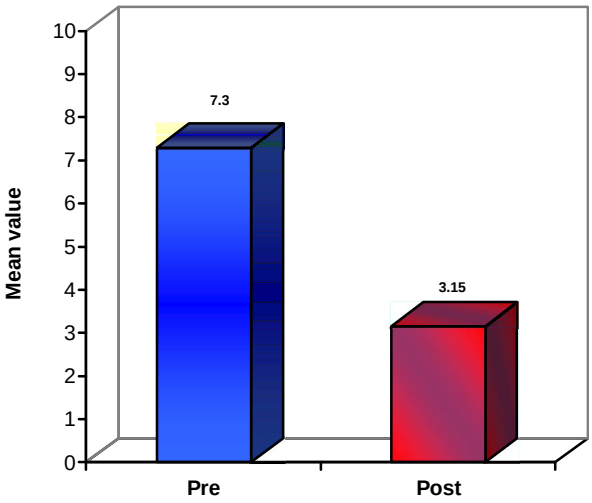


Fig. (1):. Mean value of pain severity at pre and post treatment for patient

III-Oswestery functional disability.

As observed in table (2); the mean value of oswestery disability for patients before starting the study was 60.25±15.21 and it decreased after the end of the treatment programme to 35.65±11.25 with the mean difference of 24.600. The difference is highly statistically significant (p<.001) increase with percentage of 40.85% improvement in functional disability at the end of treatment programme (Fig.2).

	Pre-treatment	Post-treatment
X	60.25±15.21	35.65±11.25
Mean diff	24.600	
% of change	40.85%	
T-Value	9.440	
P-Value	0.001	
Significance	High significance	

Table (2): Mean value of Oswestery functional disability test at pre and post treatment for patients.

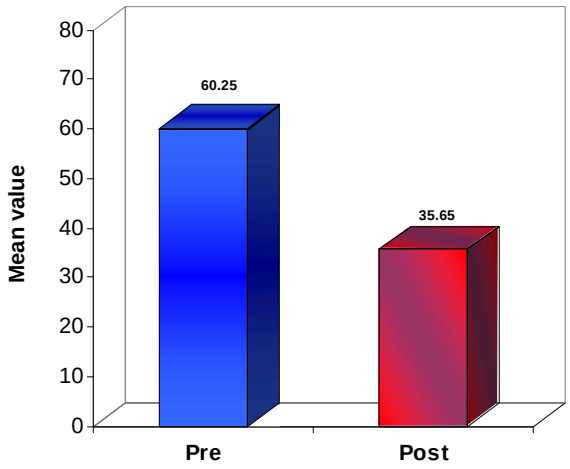


Fig. (2): Mean value of Oswestery disability at pre and post treatment for patients.

4. Discussion:

Post partum lumbo-pelvic pain is a serious problem for the women, as it has an effect on their performance of the daily living activities so that, it has an effect on her family and society (Britt et al .,2004).

More than 50%of women complain of low back pain post partum and backache may persist up to one year (Darryl et al., 2007).

A specific stabilizing exercises program in women with post partum pelvic pain improve the functional status, reduce low back pain and improve the quality of life (Stuge et al.,2004).

Lumbar stabilization exercises that are directed at the local muscle system have been advocated by physiotherapists as an effective means of treating chronic low back pain by enhancing the dynamic stability of the lumbar spine (Richardson and Jull, 1995).

In this study twenty patients were suffering from post partum low back pain and received stabilization exercises. Result of this study showed a highly statistically significant ($p<0.01$) decrease in pain severity , this result agree with Hides et al., (1996) who compared between lumbar stabilization exercises and medical treatment on 39 patients complaining from acute low back pain . They measured pain severity by visual analogue scale and pain diaries they reported significant decrease in pain severity in both the lumbar stabilization exercise program and control group.

Also Taimela et al .,(2000) conducted a study to examine the effect of lumbar stabilization exercises on low back pain patients .They used visual analogue scale to measure pain intensity .They reported decrease in low back pain severity .

Also the results showed significant differences in function disability , this agree with Richardson and Jull (1995) who reported that he specific sub maximal training of lumbar stability muscles of lumbar spine and integration of this training into functional tasks decrease both pain severity and functional disability in patients suffering from low back pain.

The results were also supported by O'Sullivan et al., (1997) who used Oswestry disability questionnaire to assess patient's level of functional disability; they reported decrease in functional disability in stabilizing exercise group. A accordingly, it was found that lumbar stabilizing exercise for lumbo-pelvic muscles were effective in decreasing pain intensity and improving the functional disability.

5. Conclusion:

It can be concluded that lumbar stabilizing exercises for lumbo-pelvic muscles decrease the pain intensity, and improve the function disability postnatal.

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Oswestery disability Questionnaire

Section 1: Pain Intensity

I have no pain at the moment
The pain is very mild at the moment
The pain is moderate at the moment
The pain is fairly severe at the moment
The pain is very severe at the moment
The pain is the worst imaginable at the moment

Section 2: Personal Care (eg. washing, dressing)

I can look after myself normally without causing extra pain
I can look after myself normally but it causes extra pain
It is painful to look after myself and I am slow and careful
I need some help but can manage most of my personal care
I need help every day in most aspects of self-care
I do not get dressed, wash with difficulty and stay in bed

Section 3: Lifting

I can lift heavy weights without extra pain
I can lift heavy weights but it gives me extra pain
Pain prevents me lifting heavy weights off the floor but I can manage if they are conveniently placed eg. on a table
Pain prevents me lifting heavy weights but I can manage light to medium weights if they are conveniently positioned
I can only lift very light weights
I cannot lift or carry anything

Section 4: Walking

Pain does not prevent me walking any distance
Pain prevents me from walking more than 2 kilometres
Pain prevents me from walking more than 1 kilometre
Pain prevents me from walking more than 500 metres
I can only walk using a stick or crutches
I am in bed most of the time

Section 5: Sitting

I can sit in any chair as long as I like
I can only sit in my favourite chair as long as I like
Pain prevents me sitting more than one hour
Pain prevents me from sitting more than 30 minutes
Pain prevents me from sitting more than 10 minutes
Pain prevents me from sitting at all

Section 6: Standing

I can stand as long as I want without extra pain
I can stand as long as I want but it gives me extra pain
Pain prevents me from standing for more than 1 hour
Pain prevents me from standing for more than 30 minutes
Pain prevents me from standing for more than 10 minutes
Pain prevents me from standing at all

Section 7: Sleeping

My sleep is never disturbed by pain
My sleep is occasionally disturbed by pain
Because of pain I have less than 6 hours sleep
Because of pain I have less than 4 hours sleep
Because of pain I have less than 2 hours sleep
Pain prevents me from sleeping at all

Section 8: Sex Life (if applicable)

My sex life is normal and causes no extra pain
My sex life is normal but causes some extra pain
My sex life is nearly normal but is very painful
My sex life is severely restricted by pain
My sex life is nearly absent because of pain
Pain prevents any sex life at all

Section 9: Social Life

My social life is normal and gives me no extra pain
My social life is normal but increases the degree of pain
Pain has no significant effect on my social life apart from limiting my more energetic interests e.g. sport
Pain has restricted my social life and I do not go out as often
Pain has restricted my social life to my home
I have no social life because of pain

Section 10: Travelling

I can travel anywhere without pain
I can travel anywhere but it gives me extra pain
Pain is bad but I manage journeys over two hours
Pain restricts me to journeys of less than one hour
Pain restricts me to short necessary journeys under 30 minutes

Pain prevents me from travelling except to receive treatment

Score: / x 100 = %

Scoring: For each section the total possible score is 5: if the first statement is marked the section score = 0, if the last statement is marked it = 5. If all ten sections are completed the score is calculated as follows:

Example: 16 (total scored)

50 (total possible score) /50 x 100 = 32%

If one section is missed or not applicable the score is calculated: 16 (total scored) 45 (total possible score) x 100 = 35.5%

Minimum detectable change (90% confidence): 10%points (Change of less than this may be attributable to error in the measurement) .

- Scores (0-20%) (Minimal disability).
- Scores (20%-40%) (Moderate).
- Scores (40%-60%) (Severe)
- Scores (60%-80%) (Crippled).
- Scores (80%-100%) (Patients are confined to bed**). (Fairbank and Pynsent,2000).**

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