

# EFFECTIVENESS OF KIRKS SPINAL STRETCHING EXERCISE ALONG WITH ABDOMINAL MUSCLE STRENGTHENING EXERCISE REGIME FOCUSING ON LOW BACK PAIN AFTER LOWER SEGMENTAL CAESAREAN SECTION (LSCS) – A CASE STUDY

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## ABSTRACT

**BACKGROUND:** Postpartum Back Pain is common, with up to 75% of women experiencing back pain immediately following birth. Low Back Pain may cause due to spinal anesthesia after lower segmental caesarean section. Many parturient and their obstetricians believe that spinal anesthesia will cause Low Back Pain. However all Low Back Pain is not caused due to spinal anesthesia and we documented a case study about Low Back Pain after cesarean delivery. Therefore, she was unable to properly care for her newborn.

**Case report:** A 29 years old female presented a Low Back Pain that begins after delivery. Pain was 7 out of 10 on the numeric pain scale. There was no history of LBP or Pelvic girdle pain prior to or during her pregnancy. According to the hospital records, there were no issues associated with the administration of the epidural.

**Conclusion:** Postpartum Low Back Pain was reduced by giving Kirks Spinal Stretching and Abdominal Muscle Strengthening Exercise. The Spinal Range of Motion is also increased.

**Keywords:** Low Back Pain, Spinal Anesthesia, Kirks Spinal Stretching, Dead Bug Exercise and Posture

## 1.1 INTRODUCTION

Low Back Pain (LBP) is common during pregnancy and after delivery. According to most studies, at least half of the pregnant population is affected <sup>[1(2-4)]</sup>. Acute post spinal backache is a self-limiting condition that resolves within 7 days without any treatment in most patients, but the symptoms overlap with those of serious neurological complications like epidural abscess or epidural hematoma <sup>[5]</sup>. Persistence of Low Back Pain for at least 6 months after delivery <sup>[4, 6, 7]</sup>. Many parturient and their obstetricians believe that spinal anesthesia will cause Low Back Pain <sup>[8]</sup>. MacArthur et al proposed, the most plausible hypothesis is that the origin of the problem is postural. Stressed positions can occur in normal labor and independently give rise to subsequent backache. Such postural problems can be aggravated by muscular relaxation and abolition of pain associated with epidural anesthesia <sup>[9]</sup>. The nonselective nerve block induced by the epidural administration of a local anesthetic causes muscular relaxation in the lower back and legs, leading to immobility and long periods in stressed positions. In addition, movement under epidural anesthesia (EA) generally requires assistance, and a woman can remain in a potentially damaging position for several hours without complaining of any discomfort. Thus, epidural-related back pain could be initiated by the loss of normal joint protective reflexes due to anesthesia, leading to prolonged maintenance of poor posture and stressed positions during labour. Such stressed positions under epidural anesthesia may damage the back and lead to Chronic Low Back Pain. The pathogenesis of Low Back Pain is the presence of an epidural hematoma. Back pain is the usual presenting symptom in cases of epidural hematomas, either spontaneous in origin or associated with spinal or epidural procedures <sup>[11-13]</sup>. Specific nociceptors are found in intramuscular <sup>[14]</sup> and periosteal tissues <sup>[15]</sup>, and one cause of epidural-related back pain may be the activation of these nociceptors by the small hematomas associated with epidural needle insertion <sup>[10]</sup>. Brattebo G et al <sup>[16]</sup> found that the source of Low Back Pain is multifactorial which includes type and duration of surgery, duration of immobilization, and the position of the patient during spinal puncture. Other contributing factors include needle trauma, surgical positioning, and injection of saline or local anesthetic into the interspinous ligaments and development of a supraspinous hematoma. Excessive stretching of ligaments after relaxation of paraspinal muscles and localized trauma to the intervertebral disc has also been implicated in causing Low Back Pain <sup>[17, 18]</sup>. Many studies have demonstrated that recovery of Low Back Pain and Pelvic Girdle Pain after pregnancy is often incomplete and may persist for years after child- birth. Some studies show that the hot and cold massage with mild analgesics or tropically NSAIDs ointments may give rise to temporary relief to post spinal Low Back Pain <sup>[5]</sup>. The aim of this study is to reduce

postpartum Low Back Pain which will have caused by spinal anesthesia during caesarean, to reduce the risk of abdominal muscle weakness and to improve the Spinal Range of Motion.

This case study details a patient who experiences Low Back Pain several months after a cesarean section. Her condition was evaluated and treated successfully and conservatively with Physical Therapy.

## 2.1 A CASE REPORT:

Informed consent was signed by the patient for the examination, treatment, and the publication of her case. This case involved a 29 year old female with Low Back Pain. She had a history of Low Back Pain after cesarean section. The Low Back Pain begins 1 week after giving birth. The patient reported that the pain was excruciating and continued to progress until it was rated 7/10 on the visual analog scale (VAS). Patient also reported that sitting, standing and bending forward was painful and it was relieved when patient lying supine. Activities of daily living were compromised. Therefore, she was unable to properly care for her newborn. Sitting was uncomfortable; however it was better than standing. When she did sit, she could only tolerate minimal pressure on her back, as leaning against a backrest aggravated her condition. Position of relief was lying supine on the floor.

## 2.2 Prior to and during pregnancy:

There was no history of Low Back Pain or Pelvic Girdle Pain prior to or during her pregnancy. Prior to pregnancy she was very active; brisk walks 4 to 5 days a week. This was her first pregnancy; at delivery, she had any other complication.

## 2.3 Labour:

According to the hospital records, there were no issues associated with the administration of the epidural. The patient gave birth to a healthy girl baby. Immediately following birth, Three days following delivery the Low Back Pain began. The patient reported that her lower back felt swollen to the touch and she noticed some swelling at the level she was experiencing pain. This coincided with the injection site of the epidural. The area of complaint was not red or hot, nor was there any broken skin. As stated above, the pain was dull and achy and rated as 7/10 on the VAS.

## 3.1 Outcome measures:

**Abdomen Muscle Strength:** To measure the abdominal muscle strength by using Modified Sphygmomanometer. [20, 21, 22]

**Numeric Pain Scale** [23, 24]: The Numeric Pain Scale was a scale from 1 to 10 that was presented verbally used to measure the pain.

**Spinal Range of Motion** is measured by using Modified- Modified Schober Test (MMST) [25, 26] is a modified Schober test (MST) by Van Adrichen.

Although the Abdominal Muscle Strength were measured by using Modified Sphygmomanometer. Participant was positioned on prone position and inflatable bag was placed between the anterior superior iliac spine and navel. The bag was inflated to a pressure of 70 mmHg with the valve closed and participant was asked to breathe deeply using abdominal wall muscle, then the inflatable bag was adjusted to 70 mmHg again. After that the patient were asked to draw in her abdomen. The pressure manometer showed no decrease of pressure.

The severity of low back pain was measured by using numeric pain rating scale. In this the patient was showed 7/10 score before treatment. While the range of motion was measured by using Modified Modified -Schober Test, patient was instructed to expose her back from gluteal fold to mid thoracic spine with left and right posterior superior iliac spine. And then the patient was asked to stand erect with her eyes directed horizontally, arms at the side. After that the therapist should identified and mark the Posterior Superior Iliac Spine by marker then the final mark was marked on the lumbar spine 15 cm above the midline sacral mark. The measurement tape was kept firmly and then patient was asked to bend forward with instruction. It shows 17 cm before treatment.

## 4.1 Treatment protocol:

**4.1.1 Kirk's spinal stretching** (27, 28): The patient were asked to sit on a straight chair and instructed to place her feet on the floor; resting the palms of her hands over thighs above the knees. Ask her to get the head and chest forward by allowing the elbows to bend slightly outwards until a slight stretching sensation is felt in her low back. Asked her to hold this position for three full cycles of breathing and then asked to get back while breathing out. Repeat these for five times.

**4.1.2 Kirk's twisting spinal stretch:** Patient were asked to lie on her back, arms outstretched sideways, knees bent and flat feet on the floor. Patient were instructed to raise one leg, still slightly bent at the knee and cross it over the other leg, and allowing gravity to take that leg towards the floor until foot touches it. Asked to repeat this for five times, springing the twisted segments of the spine gently and then rest in this twisted position and this process on the other side of the body.

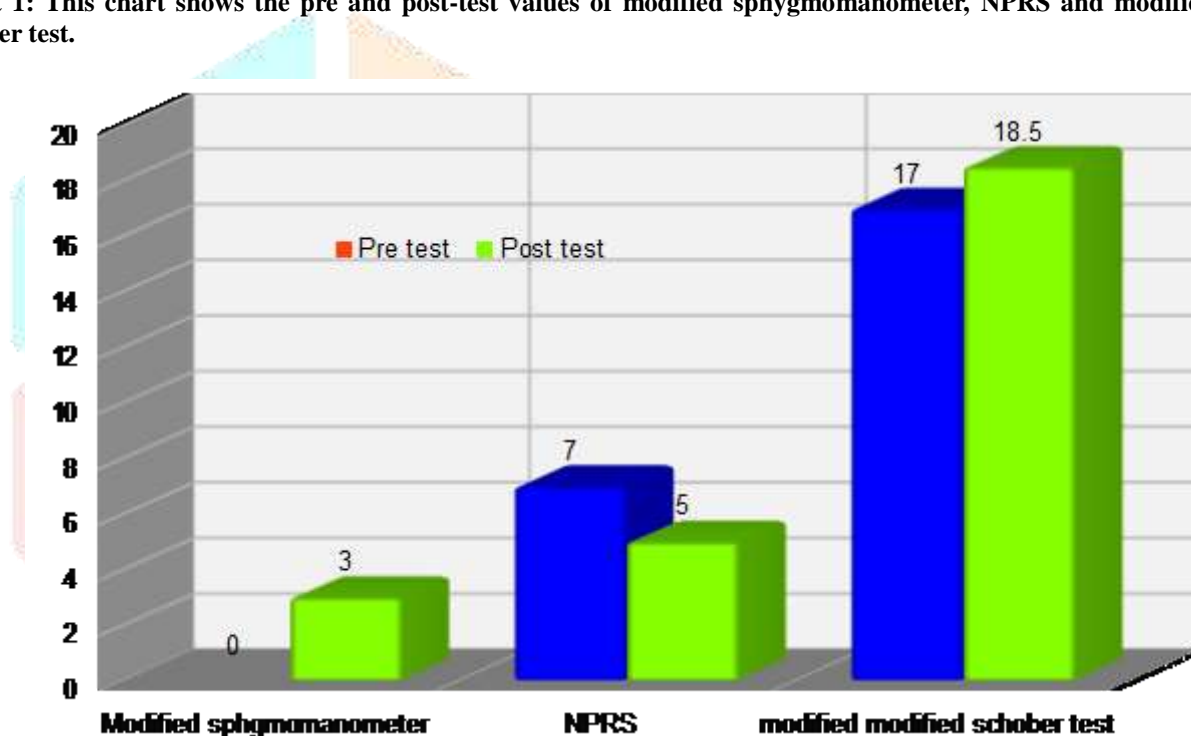
**4.1.3 Kirk’s spinal mobilization (prayer position):** patient instructed to get into her hands and knees, with her thighs and arms perpendicular to the floor and fingers pointing towards each other. Patient were asked to bend elbows to allow her head to drop towards the hands, but keep her head as upright as the position allows. Breathe normally and on an exhalation, take her chin as close to her hands as possible and asked her to slowly roll an invisible pea towards her knees with chin.

**4.1.4 Cat and camel exercise:** patient was instructed to kneel on a carpeted floor, weight on her knees and elbows for upper spine, and knees and hands for lower spine. During inhalation patient were instructed to arch her back upward while pulling navel toward her spine and asked her head to drop toward the floor; hold for 5 seconds. While exhalation patient asked to lower spine and lift head; hold for 5 seconds. Instruct to repeat this sequence 5 times in each direction.

**4.1.5 Dead bug abdominal muscle strengthening exercise<sup>(29)</sup>:** The subject should ask to lie on supine position with the spine maintained in neutral position. Prior to performing this exercise subjects were asked to slowly pull the abdomen towards the spine. Patient was asked to flex the shoulders in 90 degrees flexion and knee joint in 90 degree flexion. And then the patient was asked to move her both upper and lower extremities alternatively with the shoulder, hip and knees flexed to 90 degrees in flexion. Ask to perform this exercise at the speed of 40 beats per minutes for progression 60 beats per minutes.

The patient was reviewed after 6 week with these treatment protocols. The test result shows decreased 2 to 3 mmHg pressure on modified sphygmomanometer ; 6/10 score on numeric pain rating scale and 18.5 cm on modified modified schober test.

**Chart 1: This chart shows the pre and post-test values of modified sphygmomanometer, NPRS and modified modified schober test.**



**5.1 Results:**

Table 1: This table represent the pre and post-test values of outcome measures which was used in this study

Outcome measures	Modified sphygmomanometer	Numeric pain rating scale	Modified modified schober test
Pre-test value	0 mm Hg	7/10	17 cm
Post-test value	3 mm Hg	5/10	18.5 cm

This result shows the significant changes after the 6 weeks treatment protocol. The pain score was decreased significantly as mentioned above.

**6.1 Discussion:**

It is well known that back pain during the postpartum period is a common occurrence for new mothers. Result indicates that CD wit EA may be a factor for subsequent LBP. There are several possible explanations for this. First, as MacArthur et al proposed,

the plausible hypothesis is that the origin of the problem is postural. Stressed positions can occur in normal labor and independently give rise to subsequent backache. Such postural problems can be aggravated by muscular relaxation and abolition of pain associated with epidural administration of a local anesthetic causes muscular relaxation in the lower back and legs, leading to immobility and long periods in stressed positions. Thus epidural related back pain could be initiated by the loss of normal joint protective reflexes due to anesthesia, leading prolonged maintenance of poor posture and stressed positions during labor. Such stressed positions under epidural anesthesia may damage the back and lead to chronic LBP. The authors also found that many symptoms began in the first week after delivery, but in some women, LBP did not appear until several weeks after deliver, although it was still associated with Epidural anesthesia.

The association between EA and LBP has been hypothesized that poor posture during labor and delivery because of effective analgesia, muscular relaxation, immobility and stressed posture results in primarily postural pain. Enormously physical and physiological changes during pregnancy and after delivery such as lumbar lordosis, center of gravity rise and fall, loss of abdominal muscle support resulted in intense stretch on the lower back. Maternal workload such as repetitively lifting baby in bend forward and twisted positions, heavy physical work and other tedious housework should contribute to trigger LBP after delivery. Madeira HG et al revealed that women with urinary tract infection may have an increased risk factor for low back pain. In younger and older ages have been reported to be associated with an increased risk of persistent low back pain; this is possibly due to the more pronounced collagen laxity as result of higher sensitivity to the effects of hormones such as relaxin and estrogens. But our study suggest that this low back pain are preventable by strengthening the abdominal muscle and increased lumbar range of motion and some back care advise that is proper baby carrying positions, sitting positions and house hold activities.

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