

Systematic Review Article: Pregnancy-Related lumbosacral Pain; Etiology, Surgical and Non-surgical Management: Systematic Review

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ABSTRACT

Introduction: A woman's body undergoes physiological and anatomical changes during pregnancy that affect a number of systems, including the musculoskeletal system. These alterations may result in low back pain or low pelvic pain during or after pregnancy, impairing the movement of these structures and causing discomfort. **Material and methods:** Using the terms "low back pain," "pelvic girdle pain," "lumbopelvic pain," "posterior pelvic pain," "pregnancy-related low back pain," "pregnancy-related pelvic girdle pain," and "pregnancy-related lumbopelvic pain," we searched the literature in Pubmed, Cochrane Library, Ovid, and Google for articles in English, Portuguese, and Spanish published in the previous 20 years or older, as appropriate. **Results:** In this study we focus on terminology, epidemiology, risk factors, pathophysiology, prognosis, diagnosis, and treatment, the aim of this study was to discuss the diagnosis and treatment of pregnancy-related lumbosacral pain. **Conclusion:** One of the main causes of lumbosacral pain is pregnancy, which is also one of the most common illnesses during gestation. Pregnant women's quality of life is improved when this pathology is properly managed.

Introduction

Pregnancy alters a woman's body's physiology and anatomy and may have an impact on the cardiovascular, respiratory, endocrine, renal, and musculoskeletal systems, among other systems [1-3]. To meet the fetal needs, the pregnant woman's increased metabolic

demands, and to enable both parties to get ready for delivery, these changes are essential [4-6]. However, in many women, changes to the musculoskeletal system during pregnancy or the postpartum period result in lower back or pelvic pain, which prevents the normal movement of these structures and causes discomfort [7-9]. Being one of the most common diseases during pregnancy, pregnancy is one of the main causes

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of lumbosacral pain, which has gained attention in recent years due to the negative effects it has on the pregnant woman's life and the associated costs [10-12]. The degree of disability and pain intensity are directly correlated with absenteeism. When compared to other pregnant women, the absence rate for those who experience pelvic pain (PP) or low back pain (LBP) doubles³. The daily tasks of getting up, sitting for extended periods of time, walking farther distances, dressing, carrying weights, and even having sex are difficult for pregnant women with LBP and PP. Crutches or wheelchairs might be needed in more serious situations [13-15].

This study focused on the terminology, epidemiology, risk factors, pathophysiology, prognosis, diagnosis, and treatment of pregnancy-related lumbosacral pain (PRLSP), with the aim of addressing the diagnosis and management of this condition [16-18].

Material and methods

The terms "low back pain," "pelvic girdle pain," "lumbopelvic pain," "posterior pelvic pain,"

"pregnancy-related low back pain," "pregnancy-related pelvic girdle pain," and "pregnancy-related lumbopelvic pain" were used to search Pubmed, Cochrane Library, Ovid, and Google for articles published in English, Portuguese, and Spanish 20 years ago or more, as appropriate. The study only included the most pertinent articles on the subject [20-22].

PATHOPHYSIOLOGY

The etiology of PRLSP is unclear. Pain results from changes in the load pattern on the joints and other musculoskeletal structures brought on by weight gain during pregnancy, along with changes in posture needed to accommodate the larger abdomen and breasts. From a biomechanical perspective, an increase in uterine volume causes the abdominal muscles to stretch and weaken, increasing the strain on the lumbar muscles [23-25]. Additionally, the forward-shifting center of gravity brought on by the larger breast and abdomen alters posture, increasing lumbar lordosis and the load placed on the lumbar spine and sacroiliac ligaments (Fig 1).

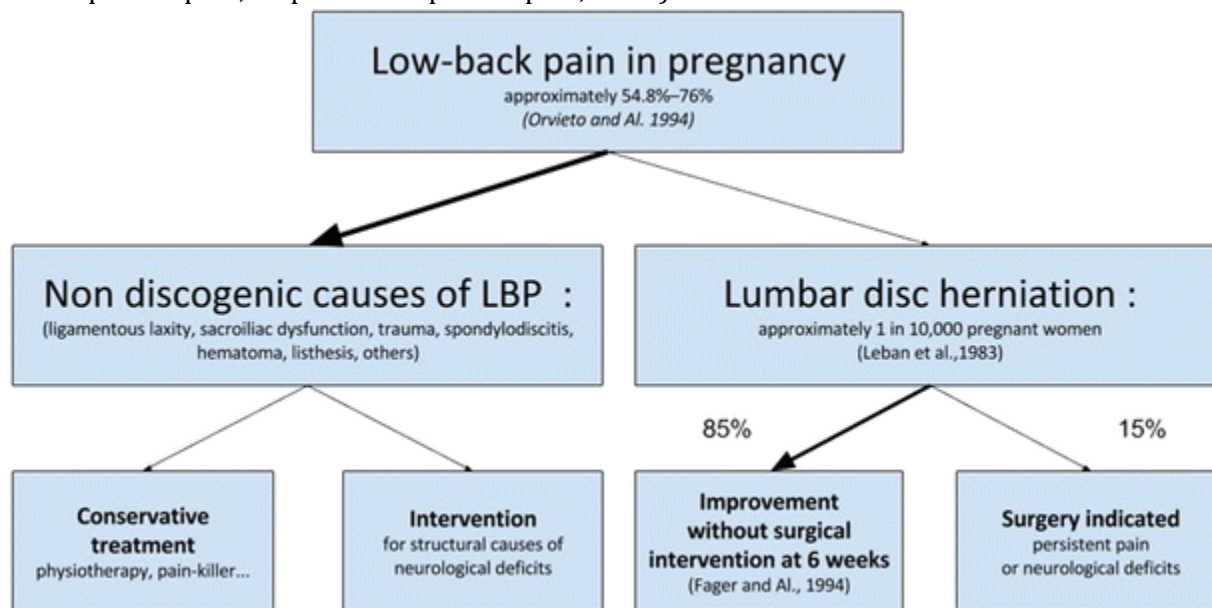


Figure 1: Pregnancy-related lumbosacral pain Pathophysiology

Intervertebral discs are compressed by the increased axial load, expelling fluid from the disc

and reducing its height, which may contribute to LBP. From an endocrine perspective, the

increased levels of progesterone, estrogen, and relaxin cause ligament laxity [26-28], which makes the hip and spine joints less stable. From a vascular perspective, the gravid uterus' compression of the large abdominal vessels leads to venous stasis and hypoxia, which impair the metabolic activity of the nerve structures and result in pain [29-31].

TERMINOLOGY

It is unclear whether the terms refer to the same condition because so many papers use different terminologies. Piliac pain, posterior low back pain, and combined pain were terms used by Madeira et al. Wu and others. introduced the term "pregnancy-related," noting that the symptoms may start following birth, and suggested the use of the terms "pregnancy-related pelvic girdle pain," "pregnancy-related low back pain," and "pregnancy-related lumbopelvic pain." [32-34]. The terms Wu et al recommended for this study were used [35-37].

EPIDEMIOLOGY

The incidence of PRLSP varies and ranges from 24 to 90% of pregnant women. Because there is no generally accepted taxonomy, the range of occurrence is wide [38-40]. In some studies, this prevalence can be as high as 95.23% of pregnant women [41-43]. A Cochrane review found that more than two-thirds of pregnant women had LRP and about a fifth had PP. It usually begins around week 18 of pregnancy and peaks between weeks 24 and 36. The prevalence of PRLSP between 12 and 18 weeks of gestation is approximately 62%, with 33% of pregnant

women having PP, 11% LBP, and 18% both. Around week 35 of pregnancy, the incidence of LBP reached 71.3% and that of PP reached 64.7%.

RISK FACTORS

Strenuous work during pregnancy and a history of PRLSP are two examples of factors that are predictive of lumbosacral pain. Pregnant women with advanced maternal age, a history of LBP in prior pregnancies, elevated body mass index (BMI), joint hypermobility, pain that gets worse when lying down for extended periods of time, and higher levels of anxiety have a higher incidence of LBP [44-46].

A strong predictor of recurrence in subsequent pregnancies, with a probability of about 85% [16], is the history of LBP in previous pregnancies. In terms of PP, demanding work, a history of low back pain or trauma to the pelvic bones, advanced pregnancy stages, a higher BMI, and higher depression scores are significant predictors [47-49].

Pain severity, catastrophizing pain levels, depression, and anxiety are all related. Pre-eclampsia, low birth weight, prematurity, and abortion are just a few of the complications that are linked to anxiety during pregnancy. Important risk factors for postpartum depression include depression and anxiety. When compared to pregnant women who are not experiencing pain, pregnant women with PRLSP have a three times higher likelihood of exhibiting postpartum depression symptoms (fig 2) [50-52].

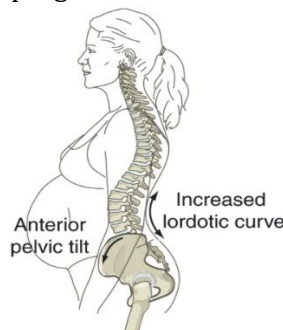


Figure 2: Risk Factors Associated with Low Back Pain among pregnancy**CLINICAL PRESENTATIONS**

PRLSP may present as PP, LBP, or as a combination of the two. Both become more severe as the pregnancy progresses, and in some cases the pain may spread to the gluteal area, thigh, leg, and foot. Since LBP and PP have different etiologies and call for different kinds of treatment approaches, it is crucial to distinguish between them. Specifically close to the sacroiliac joints, the posterior aspect of the thigh can be affected by pregnancy-related pelvic pain (PRPP), which is located between the gluteal fold and the posterior iliac crest [53-55].

Pubic symphysis pain can be present alone or in combination with other pains, and it may radiate to the front of the thigh. The pain is sporadic and can be brought on by prolonged postures, usually while performing daily activities like walking, sitting, or standing [56-58]. The topography of the sacroiliac joints, painful palpation of the gluteal musculature, and positive PP provocation tests are the first signs of pain during pregnancy [60-62].

Without the pubic symphysis component, the posterior PP is deemed low. It is distinguished by a burning pain in the gluteal area, distal and lateral to the L5 to S1 region, and may or may not radiate to the back of the thigh and knee. The posterior PP provocation test is positive, it is intermittent, typically related to weightlifting, and the hips and spine can move within their normal range. Pregnancy-related low back pain (PRLBP) affects the lower back and can radiate down the leg [63-65].

It is caused by the sacrum, the lateral borders of the erector muscle of the spine, and the upper region of the spinal process of the last thoracic vertebra. The pain is typically made worse by anterior flexion, restricts motion in the lumbar region, and is made worse by palpating the erector spinae muscles [66-68]. Before becoming pregnant, the first sign may appear.

The lumbar range of motion decreases, and the PP provocation tests come back negative.

There is typically no correlation between the condition and the ability to walk or carry out daily activities like sitting or standing. While PRLBP seems to be more severe and prevalent after birth, PRPP is more severe and incapacitating during pregnancy [69].

DIAGNOSIS

Pregnant women with PRLSP need a good history and physical examination to rule out other causes of pain, to differentiate between low back pain and low PP, to differentiate degrees of disability, and to recommend individualized treatment. Warning signs may include history of trauma, weight loss, malignancy, use of steroids and other immunosuppressive conditions, neurologic symptoms, and fever. These red flags can indicate the presence of underlying causes such as inflammation, infection, trauma, tumors, degenerative or metabolic causes [70].

Diagnosis of PRLSP is based on symptoms, as few tests are available. However, it is important to know the difference between PRLBP and PRPP because the management and prognosis of the two conditions are different. Testing for pain location, nature and intensity, triggers, and stimuli is helpful. In addition to the clinical picture described for PRPP, the European guidelines recommend performing a functional test (raising the right leg), four sacroiliac tests (PP, Patrick-Faber, Haenslen's posterior provocation and palpation of the dorsal ilium longus).

ligaments) and two pelvic girdle tests (palpation of the connecting leaf and a modified Trendelenburg test of the pelvic girdle). A diagnosis of PRPP is considered positive with either a positive functional test and a positive sacroiliac joint test or a positive combined test. PRPP is divided into five subgroups. 1) pelvic

girdle syndrome in which pain occurs in three hip joints; 2) bilateral hypochondriasis syndrome in case of pain in both temporomandibular joints; 3) unilateral temporomandibular joint syndrome with pain in an iliac joint; 4) Synthesis, when only the pelvic junction causes pain; and 5) others, with pain in one or more hip joints, but results were inconsistent. This classification is important because the number of joints involved appears to interfere with both pain intensity and pain function.

A variety of questionnaires have been applied to pregnant women with PRLSP to assess function and determine the most appropriate treatment in each case. Accordingly, pain impairment is commonly measured using the Quebec Back Pain Disability Scale.

This scale was developed to assess the degree of disability in patients with low back pain not related to pregnancy, but it has been adapted for this purpose¹⁶. Other assessment methods (such as Roland-Morris, Oswestry and Disability Rating Index (DRI)) have not been developed for this purpose and are used to assess the degree of disability and functional capacity of pregnant women. For example, the DRI used by Olsson and Nilsson-Wikmar, which assesses a pregnant woman's ability to perform one of 12 items, may not reflect the reality of most pregnant women, especially in the third trimester. The Pregnancy Mobility Index (PMI) is specifically designed to assess the ability of pregnant women with PRLSP to perform activities of daily living. It can assess the mobility and quality of life of pregnant women.

The Pelvic Girdle Questionnaire (PGQ) is a specific instrument for measuring pregnancy and postpartum PP. The Brazilian version of the questionnaire was validated in 2014 and, taking into account all the social and cultural contexts in which the questionnaire was brought, the PRPP will help to identify, as well as evaluate

and monitor the impact on the work of pregnant women.

A more appropriate way of planning treatment specific to this condition. Therefore, the development of a specific questionnaire for PRLSP and its subtypes may facilitate diagnosis and assist in appropriate treatment. The diagnosis of PRLSP is primarily clinical, but imaging studies may be necessary, especially if there are warning signs. It is good to choose one with non-ionizing radiation such as ultrasound or magnetic resonance imaging (MRI).

No change was seen with the 1.5T device, despite concerns that MRI could cause fetal malformations, acoustic damage and thermal effects. The safety of 3T devices has not yet been established. In 2013, the American College of Radiology recommended the use of MRI in pregnant women, regardless of gestational age, when the benefits outweigh the risks. In studies using ionizing radiation, doses of less than 50 mGy given at 2 or more weeks of gestation appear to be too low to be clinically detectable. Between 2 and 25 weeks, doses of 50 to 100 mGy can cause malformations, but not after 25 weeks of gestation. Doses exceeding 100 mGy may harm the fetus, especially in pregnant women, and may require further research, leading some authors to discuss indications for abortion.

PROGNOSIS

Chronic pain may result from improper management and follow-up of pregnant women with PRLBP and PRPP. Pregnancy symptoms have a direct correlation with persistent PRLSP, both recurrent and continuous. While the majority of pregnant women experience improvement within the first six months following delivery, some women will continue to experience the symptoms.

Activities that make LBP more intense, like lifting and carrying weight, are in higher demand after delivery. Due to the necessary care that the newborn requires, it is challenging to avoid

these activities. A study that looked at 464 pregnant women who had PRLSP during pregnancy found that 69% of them had continuous pain, 36% had recurrent pain, and 43% had pain six months after delivery.

Compared to pregnant women with less severe symptoms (recurrent pain), those with more severe symptoms (continuous pain) are more likely to miss work and use medical services. A specific subgroup of pregnant women with persistent PRPP may include those with more severe symptoms, and the prognosis for this group is less favorable. Serious repercussions may occur for years after pregnancy for pregnant women with PRPP.

In particular, those with a history of PRLSP in prior pregnancies, a higher percentage of positive tests for pain provocation and pressure tests on the pubic symphysis, and positive Trendelenburg or Faber tests, one in ten women may experience pain up to 11 years after giving birth. To prevent suffering, increase costs, and lessen the possibility of a transition to chronicity, the pregnant woman should be evaluated throughout her pregnancy and during the postpartum period and treated appropriately.

Identification and referral to particular treatments for subgroups of pregnant women with PRLSP is necessary. Since they have a higher intensity of symptoms and a higher chance of chronification, pregnant women who are classified as having combined pain (LBP and PP), especially at the beginning of pregnancy, should receive special attention.

TREATMENT

Due to the misconception that PRLSP is a typical pregnancy condition and the worry that the treatment will affect the pregnant woman and the fetus, treating PRLSP is a challenging task. Based on prevention, one of the treatment plans. For obvious reasons, conservative approaches are more frequently used for effective pain

management, even though their success rates are typically low. Physiotherapy, TENS, medication, acupuncture, and the use of pelvic belts are just a few of the treatment options available.

EXERCISES

The majority of PRLSP management plans include an exercise-based component. Following stabilization exercises, pelvic floor exercises, strengthening exercises, and repeated directional exercises are the techniques that are most frequently used.

In a 2015 Cochrane review that assessed the effects of any intervention to prevent or treat LBP, PP, or the association of both in women at any stage of pregnancy, soil exercises in their various formats decreased the pain scores and the functional impairment in pregnant women with LBP, with an additional improvement when information on pain management was provided to the pregnant woman.

When pregnant with LBP, hydrotherapy appears to lower the likelihood of absenteeism. When compared to standard prenatal care, physical activity does not appear to improve the prognosis for PP. Acupuncture also seems to be more effective than stabilization exercises in lowering PP.

PP's prognosis does not appear to be improved by the exercises when compared to standard prenatal care, despite the fact that LBP and PP are separate diseases and cannot be directly compared. These findings imply that the stabilization of the anatomical origin of the symptoms is essential for the effective management of the pain.

PHYSICAL MEASURES

In later stages of pregnancy, the use of straightforward tools like a nest-shaped pillow may help to lessen pain and insomnia. When a pregnant woman adopts the lateral decubitus position, the pillow supports the abdomen,

which appears to alleviate the symptoms. Another tool is a pelvic belt, which works by applying pressure to the joint surfaces to increase stability and decrease sacroiliac joint mobility while reducing pain. In comparison to stabilization exercises, the use of non-rigid pelvic belts significantly lowers pain scores and functional impairment. They ought to be used just briefly.

ACUPUNCTURE

Several studies have demonstrated acupuncture's analgesic potential in pregnant women with PRLSP when compared to control, and its use for the treatment of PRLSP has been growing over time. LBP and pelvic girdle pain during pregnancy appear to be reduced by acupuncture. Additionally, it helps people feel more capable of engaging in certain physical activities and reduces their need for drugs, which is a benefit during that time. The endogenous opioids system appears to be stimulated by acupuncture. The daily activities of pregnant women with PRLSP are improved when acupuncture is used as an adjuvant because it reduces pain more effectively than the standard treatment does by itself. Although acupuncture is thought to be a safe technique, it should only be carried out by trained professionals because certain points that supply the uterus and cervix should be avoided because they may trigger labor.

PHARMACOLOGICAL TREATMENT

The first-line analgesic for treating pain during pregnancy is paracetamol. It is a non-opioid analgesic that can inhibit central prostaglandin synthesis and modify serotonergic descending inhibitory pathways, though its exact mode of action is still unknown. It is safe to take paracetamol during pregnancy in the recommended doses. The second-line analgesics are typically nonsteroidal anti-inflammatory drugs (NSAIDs).

Use of NSAIDs during pregnancy must be done so cautiously due to the possibility of early fetal loss, oligohydramnios, fetal renal injury, and premature closure of the arterial duct. Clonidine can be a good substitute during pregnancy, along with antidepressants, anticonvulsants, local anesthetics, and other medications. Since amitriptyline was not linked to a higher incidence of malformations, it appears to be a good option for the treatment of neuropathic pain during pregnancy based on the length of use and the number of published studies.

Additionally, there seems to be no connection between venlafaxine and an increase in malformations. Neonatal withdrawal syndrome, however, can result from taking antidepressants in high doses during pregnancy or close to delivery. The alteration of neurological development is one potential teratogenic effect of sodium valproate.

Its usage in women who are pregnant or who are planning a family who have bipolar disorders has already been outlawed in some nations. There are only a few reports of pregnant women taking gabapentin, and there is no proof that this leads to more malformations. It might be associated with a higher risk of fetal loss, constrained intrauterine growth, and preterm birth. According to the Australian Drug Evaluation Committee (ADEC) and the Food and Drug Administration (FDA), it is categorized as B3 and C, respectively.

When used as a monotherapy in the first three months, pregabalin does not seem to be significantly associated with an increase in malformations. One of the most popular analgesics for the management of PRLSP is cyclobenzaprine, which is thought to be safe during pregnancy. It is frequently used in pregnant women despite a report of the arterial duct closing too soon. The FDA has assigned it a B classification. 50 percent of the drug is transferred to breast milk during lactation. The FDA classifies the majority of opioids as B or C

during pregnancy, with the third trimester being the main time when they are classified as D because of the possibility of neonatal withdrawal syndrome.

It is best to assess each drug separately, though. Codeine is categorized as A by ADEC and is not associated with a higher rate of malformations or fetal survival. When taken close to conception, tramadol appears to be linked to an increase in the likelihood of malformations (clubfoot and cardiovascular defects), but does not appear to have any significant effects when taken later in pregnancy. The FDA and ADEC classify it as Class C. Although there have been no reports of morphine-related malformations when it has been used in the first quarter, it should still be used with caution. Neonatal withdrawal syndrome is more likely to affect

newborns who have been exposed to opioids with shorter half-lives, such as morphine.

The FDA and ADEC both classify it as Class B. For the treatment of chronic pain during pregnancy and lactation, transdermal fentanyl appears to be a good option. It does not appear to pass into breast milk, despite the possibility of neonatal withdrawal syndrome when used in high doses or close to term. While the majority of opioid treatments given during pregnancy are brief, those given to women who regularly used opioids prior to getting pregnant often continue using them up until the term. Opioid long-term treatment during pregnancy is not advised, but it might be required for the management of chronic pain or dependence. To stop withdrawal syndrome, one could use methadone and buprenorphine(fig 3).

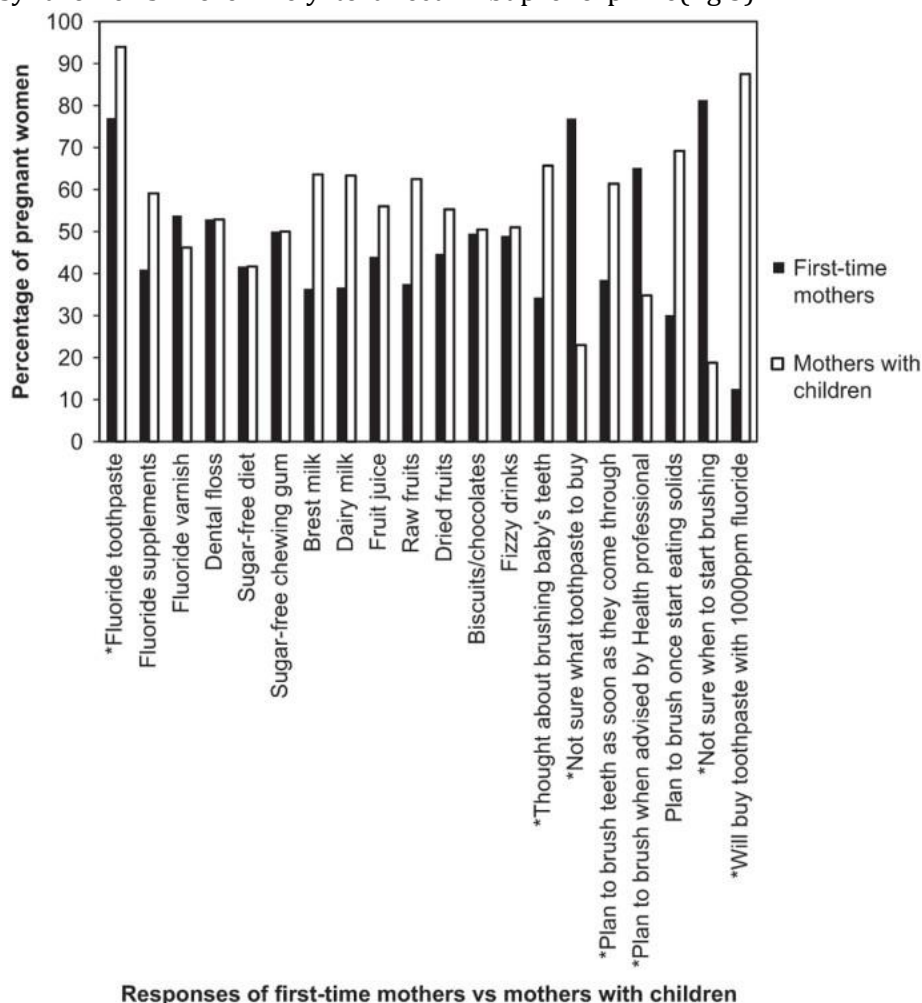


Figure 3: PHARMACOLOGICAL TREATMENT OF BACK PAIN RELATED PREGNANCY

NON-SURGICAL TREATMENTS

Although one dose poses little risk to the fetus, the use of steroids in the epidural space during pregnancy is debatable. Its use is recommended for expectant women who have newly developed symptoms that are consistent with compression of the lumbar nerves (such as unilateral loss of deep reflex, motor, and sensitive changes in the distribution of one dermatome).

There have been case reports of pregnant women with sciatica and signs of radicular pain receiving peridural steroids, which improved their pain perception. However, some of these cases required surgery because the neurological symptoms persisted or worsened, necessitating further treatment.

Given either as a single dose or for a brief period of time during the periods of increased pain, peridural analgesia appears to have a positive effect in patients with PRLSP. Whatever the situation, it should be regarded as a short-term pain relief strategy until delivery. It has also been reported that the pubic symphysis and sacroiliac joints respond well to the administration of steroids and local anesthetics.

SURGICAL TREATMENT

Surgery plays a limited part in the management of pregnancy-related PRLSP. When necessary, good coordination between the surgeon and the obstetrician is required. In the first quarter, you can use the prone position, but in the second, you can use the lateral decubitus on either side. Due to the gravid uterus' compression of the vena cava, the left lateral decubitus should be used during the third trimester. However, starting at week 34, the pregnancy interruption should be discussed. Fetal heart rate should be tracked starting in the 23rd week. In the literature, surgical procedures like discectomy, microdiscectomy, laminectomy, and endoscopic surgery have been reported as being used to

treat disc herniations that result in neurological deficits (sensory, motor, bladder, and/or intestinal alterations) during pregnancy. When surgery is appropriately indicated, there is a good chance of recovery of function and no rise in morbidity or mortality.

CONCLUSION

Most pregnant women are susceptible to the common pathological condition known as PRLSP. Despite this, there are still concerns regarding the identification and effective treatment of this condition. On the other hand, since the location of the pain is common to other conditions, it is crucial to look for any early warning signs, such as leg pain, neurological deficits (paresthesia and/or weakness), changes in intestinal and urogenital function, fever, and others.

Even though clinical diagnosis is more frequent and reliable, there are some situations where imaging tests, preferably those that don't involve non-ionizing radiation (ultrasound and MRI), are required. Because PRLSP is regarded as a normal pregnancy condition, treating it can be challenging due to concerns that the pregnant woman or fetus may change as a result of the medication. Prevention is the foundation of one of the treatment plans. For obvious reasons, conservative approaches are more frequently used for effective pain management, even though their success rates are typically low. The most widely used medications are NSAIDs and paracetamol.

Opioids can be used for more severe pain, but they shouldn't be given for very long or close to the term. Joint blockades or epidural anesthesia have been used with positive reported outcomes. Surgery is only used to treat more severe cases, but when it is indicated, it has a good success rate and restores function while having no negative effects on morbidity or mortality. Therefore, it is crucial that medical

professionals are aware of safe management techniques for PRLSP that lessen suffering and provide comfort to the expectant mother.

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