Sacroiliac infiltration in pregnant women guided by ultrasound. Case report

Infiltração sacroilíaca em gestante guiada por ultrassom. Relato de caso

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ABSTRACT

BACKGROUND AND OBJECTIVES: Pregnancy-related pelvic pain (PRPP) is one of the most frequent causes of pain during pregnancy, which can result in significant physical disability. It is often undertreated, as it is a condition considered normal during pregnancy and there is fear that the treatment may cause changes in the pregnant woman and the fetus. The objective of this study was to report a case of PRPP, its treatment with sacroiliac joint infiltration guided by ultrasound and to perform a literature review.

CASE REPORT: Pregnant woman at 35 weeks of gestation, developing PRPP originating from the left sacroiliac joint. She underwent ultrasound-guided joint infiltration with 5mL of 0.5% ropivacaine and 20mg of methylprednisolone. The patient had no pain after the procedure and remained so after delivery.

CONCLUSION: Despite the few cases described in the literature, the use of pain intervention treatment in pregnant women seems safe and effective.

Keywords: Pelvic girdle pain, Pregnancy, Sacroiliac joint, Ultrasonography interventional.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A dor pélvica relacionada à gestação (DPRG) é uma das causas mais frequentes de dor, podendo causar incapacidade física significativa. É muitas vezes subtratada, pois é uma condição considerada normal durante a gestação e há receio de que o tratamento possa causar alterações na gestante e no feto. O objetivo deste estudo foi relatar o caso de gestante com DPRG; e o tratamento com infiltração de articulação sacroilíaca guiada por ultrassom e realizar revisão da literatura.

RELATO DO CASO: Gestante com 35 semanas, evoluindo com DPRG com origem em articulação sacroilíaca esquerda. Foi submetida à infiltração da articulação guiada por ultrassom com 5mL de ropivacaína a 0,5% e 20mg de metilprednisolona. A paciente apresentou ausência de dor após o procedimento, permanecendo assim após o parto.

CONCLUSÃO: Apesar de poucos casos descritos na literatura, a utilização do tratamento de intervenção em dor em gestantes parece seguro e eficaz.

Descritores: Articulação sacroilíaca, Dor da cintura pélvica, Gravidez, Ultrassonografia de intervenção.

INTRODUCTION

During pregnancy, anatomical and physiological changes in the body occur that are necessary to meet the mother's increased metabolic demand, to meet fetal needs, and to allow the pregnant woman and the fetus to be prepare for birth. These alterations also affect the musculoskeletal system[1] and, during pregnancy or in the postpartum period, they can cause low back or pelvic pain, preventing the normal movement of these structures and causing suffering. Pregnancy is one of the main causes of lumbosacral pain and is one of the most frequent diseases during pregnancy. It has been gaining importance in recent years because of the impact it has on the pregnant woman's life and the costs involved[2]. Pregnant women with lumbosacral pain present difficulties in performing daily activities, such as standing up, sitting for prolonged periods, walking longer distances, dressing, carrying weights, and even sexual difficulties. In more severe cases, crutches or wheelchairs may be necessary[3,4]. About 76% of pregnant women may have pregnancy-related lumbosacral pain, that is, pregnancy-related low back pain, pregnancy-related pelvic pain (PRPP), or a combination of both during pregnancy[5], and about 80% experience improvement in the postpartum period. However, about 20% of pregnant women continue to experience pain six months after delivery or for three years or more[6].

The PRPP is defined as pain located between the posterior iliac crest and the gluteal fold, particularly near the sacroiliac joints, and may radiate to the posterior thigh fascia. Symphysis pubis pain may occur in association or in isolation, with possible irradiation to the anterior fascia of the thigh. Pain is intermittent and can be precipitated by prolonged standing, usually occurring during daily tasks such as walking, sitting, or standing up. Posterior pelvic pain is defined as low pelvic pain without the symphysis pubis component. It is characterized by acute stabbing pain in the gluteal region, distal and lateral to the area from L5 to S1, which may or may not radiate to the posterior fascia of the thigh

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and knee, intermittent, usually associated with lifting weight, with range of motion of the spine and hips within the normal range, and positive posterior pelvic pain provocation tests[7].

The PRPP may result in significant physical disability and has important psychosocial implications, including prolonged leave from work during pregnancy, poorer quality of life, and predisposition to chronic pain syndromes[8].

The objective of the present study was to present the case of a pregnant woman with PRPP submitted to interventional pain treatment by ultrasound-guided infiltration of the sacroiliac joint and to perform a literature review on the subject.

CASE REPORT

A 42-year-old pregnant woman at her 35th week of gestation, a cake maker, was admitted to the obstetric emergency department with PRPP without a specific triggering event, with a pain score of 10 on the visual analogue scale, limping gait, and needing aid to walk. The patient reported low back pain, more intense between the left posterior inferior iliac spine and the left gluteal fold, irradiating to the posterior fascia of the left thigh, which had started about a week before. She was taking dipyrone on demand and the muscle relaxant cyclobenzaprine 5mg a day, prescribed by the obstetrician, in addition to resting.

At first, the patient showed improvement, and then presented progressive pain. Due to severe pain that did not respond to the intravenous administration of 100mg tramadol, she was referred to Clínica de Dor. She reported no fever, paresthesias, weight loss or other warning signs. Upon physical examination, the patient was 97kg, 1.60m tall, body mass index (BMI) of 37.89; presented limping gait, difficulty standing, and pain on palpation in left sacroiliac joint topography.

Among the pain provocation tests, the patient had a significant limitation in the Active Straight Leg Raise Test, positive FABER, positive posterior pelvic pain provocation test (4P) and painful palpation of the dorsal long sacroiliac ligament. The Pelvic Girdle Questionnaire (PGQ) score was 80%. Ultrasound-guided infiltration of the left sacroiliac joint was prescribed.

For the procedure, due to the increased uterine volume, the patient was positioned in the right lateral decubitus. A low frequency, convex transducer (Sonsonite, M turbo, 2-5 MHz, Bothwell, WA) was used to localize the left sacroiliac joint. After asepsis and antisepsis with the transducer in a sterile sleeve with ultrasound gel, the lower third of the left sacroiliac joint was identified at the S2 level after cephalic scanning from the sacral hiatus in the transverse plane; after identification of the left sacral cornua, the transducer was then moved laterally in the transverse position, identifying the lateral border of the sacrum and subsequently the ileum; the gap between the bony structures represented the posterior aspect of the sacroiliac joint.

A 110mm Stimuplex A 21G needle (B. BRAUN, Melsungen, Germany) was then flatly introduced, in the medial to lateral direction under direct visualization until the tip was positioned on the sacroiliac joint, and a solution with 5mL of 0.5% ropivacaine and 20mg methylprednisolone was administered. The patient reported complete improvement of pain immediately after the procedure, and was able to walk unaided. She remained in the post-anesthetic recovery room for 45 minutes and was discharged. The patient was instructed to perform physical therapy until delivery. Three weeks after the anesthesia, she underwent an elective cesarean section under spinal anesthesia with no complications. On the day of discharge and at the return visit seven days after the cesarean section she still had no pelvic pain, and was able to take care of the baby without difficulties and with no need for analgesics.

DISCUSSION

The prevalence of PRPP is around 20%, depending on the method used in the study[9,10]. In Brazil, the occurrence of pelvic girdle pain alone or combined with low back pain during pregnancy is 23.7%[11]. Pregnant women with PRPP often have impaired mobility, requiring the use of crutches or wheelchairs between 7 and 12.5% of the cases[12], and is associated with greater disability than low back pain[13]. Pregnant women with pelvic pain may have severe consequences several years after pregnancy. One in ten may present pain up to 11 years after delivery, especially those with a history of lumbosacral pain in previous pregnancies, a higher number of positive pain provocation tests and positive Trendelenburg, Faber or pressure tests on the pubic symphysis[14]. There is an important association between depression and pregnancy-related low back pain, which can negatively affect mental health and cause limitations in the pregnant woman's daily life activities. On the other hand, persistent pain in the prenatal period can be a triggering factor for chronic pain, which is commonly associated with depression and anxiety[11].

The development of PRPP is multifactorial, and it can be associated to hormonal, biomechanical, traumatic, metabolic, genetic or degenerative factors that are present during pregnancy[8]. Weight gain during pregnancy, associated with changes in posture required to accommodate the increased abdominal volume, leads to changes in the load pattern in joints and other musculoskeletal structures, which may lead to pain[15].

From the biomechanical point of view, the increase in uterine volume leads to stretching and weakening of the abdominal muscles, generating increased tension in the lumbar muscles. In addition, the breasts and abdomen volume increase shift the center of gravity forward, causing posture changes with pelvic anteversion and increased lumbar lordosis, leading to increased load on the lumbar spine and sacroiliac ligaments. The increased axial load causes compression of the intervertebral discs, leading to the expulsion of disc fluids and decreasing their height, and may contribute to lumbar pain[16]. From the endocrine point of view, ligament laxity associated with increased levels of progesterone, estrogen, and relaxin occurs, making the hip and spine joints less stable[17]. From the vascular point of view, the compression of the great abdominal vessels by the gravid uterus causes venous stasis and hypoxemia, compromising the metabolic activity of the nervous structures, causing pain[18].

Among the predictive factors, exhausting work, history of low back pain, pelvic pain or pelvic bone trauma, advanced pregnancy stages, higher BMI and higher depression scores seem to increase the chance of developing PRPP[10,19]. It is controversial,

but higher maternal age seems to be associated with increased risk of pelvic pain. It is known that with aging the joint flexibility decreases, and the distension of the pelvic girdle joints may cause more pain among older pregnant women[11].

In pregnant women with PRPP, a good anamnesis and physical examination are necessary, with the objective of excluding other causes of pain, differentiating low back pain and pelvic pain, disability level and proposing individualized treatment. Warning signs such as history of trauma, weight loss, history of cancer, use of steroids and other immunosuppressive states, neurological symptoms, fever, among others, may indicate the presence of hidden causes such as inflammatory, infectious, traumatic, neoplasic, degenerative, or metabolic causes, and those must be investigated[20].

In addition to the clinical scenario already described, the European Guideline recommends a functional test (straight leg raising), four tests for the sacroiliac (posterior pelvic pain provocation, Patrick-Fabere, Gaenslen and palpation of the dorsal long sacroiliac ligament) and two tests for the pubic symphysis (pubic symphysis palpation and modified Trendelenburg test of the pelvic girdle)[21]. Three or more positive provocation tests increase the sensitivity and specificity of diagnosis[22].

PRPP can be classified into five subgroups: 1) Pelvic girdle syndrome, when pain is present in all three pelvic joints; 2) Bilateral sacroiliac syndrome, whose pain is referred in both sacroiliac joints; 3) Unilateral sacroiliac syndrome, with pain present in a single sacroiliac joint; 4) Symphysiolysis, when only the pubic symphysis presents pain; and 5) Miscellaneous group, when there is pain in one or more pelvic joints, but with inconsistent findings. This classification is important because the number of joints involved seems to affect both pain intensity and functionality[23].

Although the diagnosis is basically clinical, the use of imaging tests may be necessary, especially when warning signs are present. Tests with non-ionizing radiation are preferable, such as ultrasonography and nuclear magnetic resonance. Despite this, there is concern that MRI could induce teratogenicity, acoustic injury, and heating effects, however, no changes have been evidenced when devices with 1.5T were used. The safety of 3T equipments has not yet been established[24]. The American College of Radiology recommended in 2013 that MRI should be used in pregnant women, regardless of gestational age, when the benefits are greater than the risk[25].

Several questionnaires have been applied in pregnant women with PRPP, with the purpose of evaluating the functionality of pregnant women and directing the most appropriate treatment for each case. The disability resulting from pain is usually measured through the Quebec back pain disability scale. Although this scale was developed to assess the degree of disability in patients with non-pregnancy-related low back pain, it has been adapted for this purpose[26].

The PGQ is a specific tool that measures pelvic pain during pregnancy and postpartum. The Brazilian version of the questionnaire was validated in 2014 and helps in the evaluation and follow-up of the impact that PRPP may cause in the functionality of pregnant women, considering the whole social and cultural context in which they live, besides contributing to find more appropriate ways to plan a specific treatment for this condition[27]. Therefore, the development of specific questionnaires for PRPP and its subtypes can facilitate the diagnosis and aid in the appropriate treatment.

Treatment of PRPP is a difficult task, due to the myth that it's a normal condition during pregnancy and the fear of the treatment causing changes in the pregnant woman and the fetus. Part of the treatment strategies is based on prevention. When seeking effective pain management, conservative measures are most often used for obvious reasons, although these treatments typically do not have high success rates. Treatment options include physical therapy, transcutaneous nerve stimulation, pharmacological treatment, acupuncture, the use of pelvic belts, interventional pain management, and surgery, among others[7].

INTERVENTIONAL PAIN MANAGEMENT

The use of steroids in the epidural space during pregnancy is controversial, despite the low risk to the fetus. Its use is indicated in pregnant women with new symptoms, consistent with lumbar nerve compression, for example, with unilateral loss of deep reflexes and motor and sensory alterations in the distribution of a dermatome[28]. There are case reports describing epidural administration of steroids in pregnant women with lumbosciatalgia and signs of radicular pain with improvement of the pain condition, but one part had to be submitted to surgical treatment due to recurrence or progression of neurological symptoms. In patients with PRPP, epidural analgesia seems to have a good result, administered either as a single dose or for a short interval of time in periods when pain increases. Nevertheless, in all cases it should be considered as a temporary method of pain relief until the date of birth[19].

ULTRASOUND-GUIDED INFILTRATION OF THE SACROILIAC JOINT FOR THE TREATMENT OF PRPP

Ultrasound-guided infiltration of the sacroiliac joint has a high rate of clinical success, even when the injection is extra-articular[29]. The administration of steroids and local anesthetics in the pubic symphysis and sacroiliac joints in pregnant women with PRPP has been reported to have a good analgesic response[30]. Despite reports of good results, interventional pain treatment is not often performed in pregnant women with PRPP.

Study[31] reported a case of a pregnant woman with posterior pelvic pain and pain in the pubic symphysis starting at the 12th week of pregnancy, requiring crutches. The patient was submitted to infiltration of the sacroiliac joint with "lidocaine and corticoid" in the immediate postpartum period, remaining with pain improvement for only "a few weeks" (the drugs and time of improvement are not specified). The procedure was performed with no complications and no adverse effects were reported. The patient had experienced PRPP in a previous pregnancy which had persisted for about two years[31].

Authors[32] reported 4 parturient women with PRPP whose histories and physical exams indicated that the origin of pain was the sacroiliac joints. All had failed conservative treatment, were more than 14 weeks into gestation, and had a BMI greater than 35 kg/m^2. They were submitted to ultrasound-guided infiltration of the

sacroiliac joint with 6mg betamethasone in 2mL of 1% lidocaine. There were no reports of adverse effects to treatment. Pain scores decreased by more than 3 points by the fourth week after the procedure and no analgesic supplements was needed before delivery.

Study[33] reported a case of a pregnant woman at 20 weeks of gestation, presenting PRPP refractory to conservative treatment. The patient had a history of similar pain in a previous pregnancy and on physical examination presented bilaterally positive pain provocation tests, indicating the sacroiliac joint as the source of pain. She underwent ultrasound-guided infiltration of the sacroiliac joints with 20mg of triamcinolone and 5mL of 1% lidocaine. After the procedure, the patient presented no pain; after two weeks, she presented pain with a score of 2 out of 10; thereafter, no pain was reported until delivery. There are no reports of adverse effects to treatment.

Study[34] reported six cases of pregnant women at the second trimester of pregnancy with PRPP, with pain originating in the sacroiliac joint. The patients were submitted to MRI, and it was found that all of them had joint edema, and two of them had sacral stress fractures in addition to the edema. The pregnant women underwent ultrasound-guided infiltration of the sacroiliac joint with 40mg of methylprednisolone and 5mL of 2% lidocaine. All patients achieved had good pain control and were monitored until the first month postpartum. The Oswestry Disability Index and the VAS presented significant improvement, and there were no reports of adverse effects[34].

Although PRPP is a very common complaint, it is undertreated. Prolonged bed rest or inadequate treatments are associated with decreased physical activity. This not only increases the risk of obstetric complications, but also the risk of cesarean sections. There are few safe therapeutic options for the treatment of pain during pregnancy, and physical therapies have limited effectiveness[34].

Even with few reported cases, interventional pain treatment seems to be adequate in pregnant women, because it uses drugs with low incidence of adverse effects on both pregnant woman and fetus and with satisfactory results in pain reduction. Remission rates lasting 1 to 6 months have been reported in 60 to 80% of patients who underwent infiltration of the sacroiliac joint[35]. In a study of over 1 million pregnant women, about 1:5 was prescribed opioids[36]. These results not only reflect the high prevalence of pain syndromes during pregnancy, but also show an increasing trend of opioid use in this group of patients, making it evident that multimodal and more balanced pain management strategies should be prioritized[37].

There are no reports that steroids associated with lidocaine during the 2nd and 3th trimesters of pregnancy cause significant adverse effects in this group of patients. Studies investigating the association of first trimester steroid use and increased incidence of malformations have shown a possible increase in the incidence of cleft lip with or without cleft palate, however, the information is conflicting, and the contribution of underlying maternal conditions is unclear[38]. There is little evidence of increased risk of preterm birth, low birth weight, or preeclampsia due to chronic use of systemic corticosteroids during pregnancy. In addition, evidence of an association between corticosteroid use and the development of gestational diabetes mellitus is lacking[34]. These are drugs that are often used during pregnancy, for example, for pulmonary maturation of the fetus, when there is a risk of premature labor, and present safety[38].

Corticoids are powerful anti-inflammatory and immunosuppressive drugs used in the treatment of several diseases. The use of corticoids during pregnancy may have maternal (autoimmune diseases, asthma, and others) and fetal (fetal lung maturation, congenital adrenal hyperplasia, autoimmune fetal thrombocytopenia, among others) indications. Dexamethasone and betamethasone, drugs that can easily cross the placenta, are more appropriate when there are fetal indications. Prednisone and methylprednisolone have limited transplacental passage and, therefore, are more appropriate for the treatment of maternal diseases[40,41].

The use of local anesthetics during pregnancy does not increase the risk of teratogenicity, and lidocaine is the most commonly used[39]. Despite the existence of few studies, ropivacaine has a B1 classification (*"Drugs that have been taken by a limited number of pregnant women and women of childbearing age, with no observed increased frequency of malformations or other direct or indirect harmful effects on the human fetus. Animal studies have shown no evidence of increased occurrence of fetal injury"*) by the Australian Classification of Drugs in Pregnancy, seeming to be safe for use in pregnant women[42], with a longer duration of block profile.

CONCLUSION

Pelvic pain is a frequent symptom during pregnancy, it can occur in more than 20% of pregnant women and there are several treatment options, from more conservative and less invasive therapies to interventional procedures. Nevertheless, questions remain about the diagnosis and proper management of this condition. The treatment of PRPP is difficult because of the fear that the treatment may cause changes in the pregnant woman and the fetus. Conservative measures are most often used, but despite the few cases described in the literature, joint blocks have been described as an effective and promising treatment. The use of ultrasound to guide the joint block can increase the efficacy and safety for the patient.

AUTHORS CONTRIBUTION

Fábio Farias de-Aragão
Data Collection, Writing - Preparation of the original

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