54 - EFFECTS OF MANIPULATION OF THE ILIUM IN WEIGHT-BEARING HINDFOOT IN PATIENTS WITH SACROILIAC JOINT DYSFUNCTION

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INTRODUCTION

The sacroiliac joints (ASI) relate the sacrum and the ilium of the pelvis and serve as a connection between the axial skeleton and lower limbs. It is a synovial joint formed by auricular facets of the ilium and sacrum cited that have irregular elevations and depressions that fit together. This setting limits the mobility and helps stabilize the joint (KONIN, 2006). In the joint and ligaments, which are richly innervated by both nociceptors and by proprioceptors are encapsulated nerve endings and non-capsulated, making this combination becomes a possible source of pain (MOORE, 2001).

The recurring symptoms from the ASI may be referred to the lower back, buttocks, thigh, groin and around the lower limb (RIBEIRO, 2003; LEE, 2001). These joints reduce the impact force to the ground, absorbing the energies of inertia between the trunk and pelvis. During the march, a moment of deceleration is created in the initial touch of the heel. This force is transmitted to the pelvis where the leg meets the torso inertial moment.

Sacral iliac joints help absorb these competing forces and, through a counter-movement to reduce the transfer speed of rotation of the pelvis to the spine, keeping it stable. In general, the presence of the ASI (still possessing small movements) allows greater flexibility to the pelvis, providing a greater adaptability of the movement while allowing greater stability by reducing torsional forces (GRAY, 1988).

Sacro-iliac Dysfunction (DSI) is a term used to characterize biomechanical abnormalities of the anatomical positioning of one or both sacroiliac joints (ASI), for example, hypomobile fixation, subluxation or bad alignment. However, this condition is still controversial and several times not shared by many authors (RIBEIRO, 2003; BORIS, 2005). The iliac conducts two types of motion in rotation, which are anterior and posterior rotation speed, which move around the sacrum, slipping into a level set in the interosseous ligament.

When one of these movements is limited, this implies a dysfunction sacroiliac (RICARD, 2002). The iliac dysfunctions are related to the exaggeration of the physiological movements of the ilium relative to sacrum. The lesion was induced by force lower limbs.

The movements impacting the iliac limb through the joint iliofemoral and vice versa. The hip adduction provokes an anterior rotation along with a descent and approach the iliac wing. Since the abduction of the hip rotation causes a subsequent rise and separation of the iliac wing.

The extension and hip external rotation are responsible for a previous rotation of the ilium for placing tension in ilio-femoral ligaments earlier. A flexion with internal rotation of hip rotation produces a posterior iliac wing by placing strain on the plan later iliofemoral ligament (RICARD, 1991).

There are five types of dysfunctions ilio-sacral, iliac anterior, posterior, slip-up, out-in-flare and flare (RICARD, 2002). In our work we will study the anterior and posterior dysfunction. The pelvis is one of the most important regions to be treated on an osteopathic point of view, since many of vertebral disorders originate in imbalances in the pelvis (RICARD, 2002). "The footrests on the floor all the static condition.

There is still good without good support, are the deformations of the feet cause or consequence of poor static "(BIENFAIT, 1989). Still, "a strain or any asymmetry of the feet up and passed always require an adaptation of the postural system (BRICOT, 1998). The anatomical structures of the foot support and properly distribute the ground reaction force in both these situations (LeDOUX, 2002). Bienfait (1989) does not believe to be accurate allocation of forces in similar proportions between the rearfoot and forefoot received by talus.

The gravity line drawn from the center of gravity to the base of support falls on a line that reaches the intermediate cuneiform. It is at this level that exerts gravity and it splits into two equal forces. This force of gravity is further divided at the forefoot, about two-thirds of the first metatarsal head and a third for the head of the fifth. Clearly, depending on the shape of the foot and its alignment to the ground, these distributions are highly variable. Forces are descendants of the upper reach the top of the talus.

A percentage of that return, the remainder is then distributed in two ways: one following the fibers of the talar body system passes the thalamus and ends in the inferior calcaneal tuberosity (VEGA, 2003). The plantar pressure distribution is affected by various factors such as anatomical structures of the foot, body weight, gender and joint range of motion (KELLER, 2001). Cavanagh et al. (1987), the analysis of load distribution with a sample of 107 individuals in the standing position, found that 60.5% of the weight is distributed on your heels, 7.8% in the middle of the foot, 28.1% in the previous Foot and 3.6% in the toes. In the upright position 57% of body weight is distributed in the region of the calcaneus / hindfoot and 43% over the previous / forefoot (TRIBASTONE, 2001).

In a study with normal subjects, approximately 60% of body weight is distributed on the heels of 31% to 38% in the region of the metatarsal heads and 2% at most in the region of the fingers (Manfio, 2001). The normal pattern of load distribution plant is 35 to 40% of the pressure in the forefoot and 55 to 60% in the hindfoot (MERCZAK, 2004; SOUZA, 2005; LORENZETTI, 2006). So for all these authors, the highest peak pressure presents itself on the back foot. The pelvic girdle is considered a set that transmits forces to the spine and lower limbs.

The assembly formed by the spine, the sacrum, iliac and lower limbs constitute an articulated system: one in the femoral hip joint and the other, the sacroiliac joint (KAPANDJI, 2000). The pelvic girdle seen together transmits forces between the spine and lower limbs and through the soft tissue surrounding it allows a stable pelvic ring (LEDERMAN, 2001). To prove this interrelationship between the structures of the pelvis with legs, Baropodometric analysis is indicated, since it allows detection of biomechanical foot faults in static phase and during the march, either in prevention is the cure, showing the results of tripping external and surgical foot and lower limbs.

The use of elements placed under the foot and visualized with the aid of Pedometer can bring changes in indications and treatment. The baropodometry has sensors designed to measure and compare the pressures developed in different parts of

the plantar right and left regions of the forefoot, midfoot and hindfoot (Bankoff et al, 2004). Osteopathy is a manual therapy method relates the structure and function of the human body.

Offers a method of diagnosis and treatment of changes in a structure related to another in a global focus, the study of appropriate relations between different parts of the body. There is a wide variety of treatment techniques, including manipulation and mobilization (LOPEZ, 2001; CHAITOW, 1982).

One of the goals of therapy osteopathic manipulative (TOM) is to restore physiological movement in areas where there is restriction or dysfunction. The manipulation has its global importance as it directly addresses the cause not only the specific problem and can find the definitive cure (CHAITOW, 1982).

The body will be organized in relation to somatic dysfunction causing an alteration in the existing distribution line of gravity within the polygon of support. One area where this change will be reflected in the footprint of the individual (LOPEZ, 2001). The objective was to identify possible dysfunctions of the sacroiliac joints, analyze the rearfoot plantar pressure through baropodometry before and after handling, and treat disorders of the sacroiliac joints evaluated and detected.

METHODOLOGY

This study was approved by the Ethics Committee on Human Research of the State University of Paraná and is classified as a clinical trial. The volunteers were informed about the objectives of the study and signed a Letter of Consent. The study was conducted at the Rehabilitation Centre of the State University of Paraná, Cascavel - PR, between July and September 2009.

The sample group initially formed by 62 individuals of both sexes was approached at random and that the inclusion criteria were: the participant presenting the iliac dysfunction with the presence or absence of painful episodes related to it, an academic course of Physiotherapy UNIOESTE , aged between 18 and 30 years, not pregnant and not showing musculoskeletal disorders (osteoma, osteoporosis, osteoarthritis, amputation, among others). 12 subjects were excluded for not presenting the iliac dysfunction. To check the normality of the data we used the Kolmogorov-Smirnov test and for comparisons, the Student t test.

RATING

The pelvis of the individual was assessed using the Gillet test, (AV1) which the individual remained standing in front of a wall on which rested his hands. The examiner placed his thumb, one on the posterior superior iliac spine (PSIS) on one side and another on the basis of the same religious side.

Directed to the individual flex the hip and knee homolateral. If the thumb is on the pelvic did not fall when the subject flexed the ipsilateral lower limb, was a fixation of the iliac, later or earlier. After the evaluation and found some fixation of the sacroiliac joint, the subjects were assessed by Downing (ADL 1), where they were placed in the supine position, the assessor on the side of the pelvis of individual performed passively flexing the knee at 90 degrees. The hand held cephalad knee and hand held the caudal foot. The evaluator conducted an internal rotation of hip abduction and extension of the lower limb and lower limb was shorter.

The ilium then turned later. In the second stage of testing, the individual remained in the same position before the maneuver, however, the evaluator made a hip external rotation, adduction and extension of the lower limb and lower limb was longer, ie the iliac turned earlier. After these reviews and found some fixing of the sacroiliac joint was evaluated with Baropodometry AM3 coupled to a platform with 4800 sensors active at 120 cm (BARO 1) where it was found in the rearfoot plantar pressure.

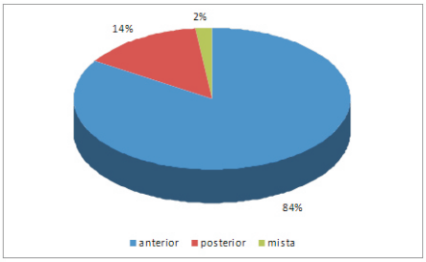
Next, the individual was placed in the prone (DV) on a table drop. If the ilium was positioned after the side to be manipulated was placed in hip extension and knee. The hand manipulated was positioned on the dorsal surface of the iliac crest (PSIS) and the hand that put the parameters rested on the ventral surface of the distal thigh, with support from the therapist to the individual's leg, the motion correction was applied in an oblique drop toward the table.

Whether the disorder was earlier, then took a hands overlapping contact with the ipsilateral buttock and made a push toward the ground (the Iliac Technique, Direct - TDI). After this manipulation (MAN), the test was done again Gillet (AV2) to validate or not the return of the biomechanics of the joint, and then reassessing Baropodometric (BARO 2) to verify the rearfoot plantar pressure after manipulation.

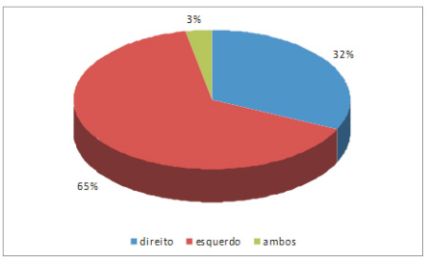
RESULTS

Figure 1 shows the prevalence of pelvic dysfunctions. The graph shows the prevalence of hand dysfunction. Figure 3 shows the prevalence of type and side of dysfunction, which may be: left anterior dysfunction (DEA), right anterior dysfunction (ADI), acute left posterior (DEP) and right posterior dysfunction (DDP). Twenty-nine individuals presented DEA (57%) ADD 14 (27%), five DEP (10%) and three DDP (6%). Regarding the presence of pain related to sacroiliac dysfunction, 38 subjects reported no pain associated (76%) and 12 reported pain in the lumbar region (24%).

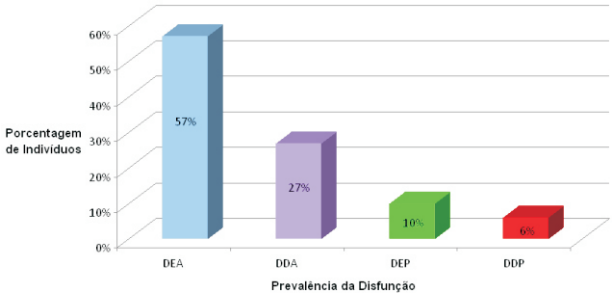
In the center of gravity, the average before the manipulation was 50.18% and after the manipulation was 49.12%, with no differences. Regarding the prevalence of dislocation after manipulation of the iliac, 47% shifted to earlier, 29% and 24% for later remained the same or not significantly different (> 3%).



Graph 1- Prevalence of disfunction before, after and mixed



Graph 2 – Prevalence and the side in relation the side the disfunction



Graph 3 – Prevalence of different disorders

DISCUSSION

The position of the bony parts of the body is determined by the tone of the muscles that are inserted in them and that the joint surfaces have their own mechanical axes that define the scope and direct the movements of the bone pieces. So, any change of tone subtle positional changes cause skeletal parts whose amplitudes come marked by the mechanical axes of the joints to which they belong. Because of this dual control, a change in tone at least trigger a cascade of topological changes on every set paratus from the sole of his foot to the pelvis (LOPEZ, 2001; Gagey, 2001). RICARD (2000), reporting on statistics about the percentage of iliac dysfunction, describes the relative frequency of sacroiliac joint dysfunction, which appear in 87.74% of the probability study.

Being most prevalent in decreasing order: left anterior iliac dysfunction (DEA) 41% of the sample, right posterior iliac dysfunction (DDP) 19%, left posterior iliac dysfunction (DEP) 19%, right anterior iliac (DDA) 13%. In our survey, figures were: 57% DEA, DDA 27%, 10% with DEP and DDP with 6% of the sample, agreeing with the prevalence of the study's author, because the DEA in our study was also the highest prevalence.

It can also analyze the percentage of the types of dysfunctions of ileum, since there is a higher prevalence in iliac dysfunction in prior (according to the study of OTOWICZ (2004) and Bianchi (2007). The painful episodes associated, there whether this low rate in the lumbar region reported by patients with sacroiliac dysfunction, and this rate of 24% of patients. These data, which goes beyond the retrospective study done by Cassidy et al (1997). Other studies have estimated that 22 5% of individuals with dysfunction of the sacroiliac joint had low back pain status, says Benatti (2003). While I agree with these studies, individuals with low back pain can be explained by the low average age of the patients analyzed.

After the manipulation was found a 47% percentage of weight loading above 29% for subsequent discharge to 24% without significant change in plantar pressure, showing that on average there is a tendency to anterior displacement of the body weight after manipulation of the ilium. From the observed events sees that the manipulation technique of ileum was effective, since back in 98% of the patients mobility sacroiliac immediately, according to the study by Tovo (2007) also achieved a high rate of return of joint mobility (93%).

CONCLUSION

Identified the possible dysfunctions of the sacroiliac joints and analyzed in the rearfoot plantar pressure baropodometry through the manipulation of the iliac ensured the correction of the anomalies identified. There was a relationship between the biomechanics sacroiliac joint and the foot rest on the ground, mainly due to the presence of changes in weight bearing immediately after correction of iliac dysfunction, and also because these changes occur in a high percentage in our sample. The weight bearing hindfoot after manipulation of the iliac decreased, but the results were not statistically significant. It is suggested that such treatment can prevent malfunctions in the rearfoot, reducing the pressure in this region.

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EFFECTS OF HANDLING ON DISCHARGE ILIAC HINDFOOT DYSFUNCTION IN INDIVIDUALS WITH SACRO ILIAC

ABSTRACT

Introduction: Sacro-iliac Dysfunction (DSI) is a term used to characterize the anatomical positioning biomechanical abnormalities in one or both sacroiliac joints (ASI). The aim of this study was to identify possible dysfunctions of the sacroiliac joints, analyze the rearfoot plantar pressure through baropodometry before and after handling, and treat disorders of the sacroiliac joints evaluated and detected. Promoting improvement of pelvic mobility through therapy osteopathic manipulative (TOM). Methods: The sample comprised 50 students from the State University of West of Paraná, campus of Cascavel. We conducted tests to diagnose specific orthopedic ISD being: Gillet test (AV1) and Test Downing (AVD1). Found some fixing in ASI, the patient was assessed with Baropodometry (BARO 1) which found in the rearfoot plantar pressure. Then there was the manipulation technique called the Direct Iliac (TDI), reassessing the iliac right after them with the Gillet test (AV2) to validate or not the return of the biomechanics of the joint. Were reassessed Baropodometric (BARO 2) to verify the rearfoot plantar pressure after manipulation. Results: The prevalence of type and hand dysfunction was 57% of the left anterior dysfunction (DEA), 27% of anterior right ventricular dysfunction (ADI), 10% of the left posterior dysfunction (DEP) and 6% of right posterior dysfunction (DDP). Regarding the prevalence of dislocation after manipulation of the iliac, 47% shifted to earlier, 29% and 24% for later remained the same or not significantly different (> 3%). Verified the effectiveness of manipulation of the iliac as it returned to 100% of the patients mobility sacroiliac immediately. Conclusion: The bearing hind foot after manipulation of the iliac decreased, but the results were not statistically significant.

EFFECTS DE LA MANIPULATION SUR LE DYSFUNCTIONNEMENT DECHANGE ARRIERÈ-PIED ILIAQUE CHEZ LES PERSONNES ATTEINTES SACRO-ILIAQUE

RÉSUMÉ

Introduction: La dysfonction sacro-iliaque (DSI) est un terme utilisé pour caractériser les anomalies de positionnement anatomique biomécaniques dans un ou deux articulations sacro-iliaques (ASI). Le but de cette étude était d'identifier les éventuels dysfonctionnements de l'articulation sacro-iliaque, l'analyse des pressions plantaires arrière-pied par baropodométrie avant et après la manipulation, et traitent les troubles de l'articulation sacro-iliaque évalués et détecté. Promouvoir l'amélioration de la mobilité du bassin grâce à la thérapie de manipulation ostéopathique (TOM). Méthodes: L'échantillon comprenait 50 étudiants de l'Université d'Etat de l'ouest du Paraná, Campus de Cascavel. Nous avons effectué des tests spécifiques pour diagnostiquer la DSI orthopédiques étant: test Gillet (AV1) et Test Downing (AVD1). Trouver une fixation à l'ASI, le patient a été évaluée avec baropodométrie (BARO 1) qui a trouvé dans la pression plantaire arrière-pied. Puis il ya eu la technique de manipulation appelée iliaque directe (TDI), la réévaluation de la iliaque droite après les avoir avec le test de Gillet (AV2) de valider ou non le retour de la biomécanique de l'articulation. Ont été réévalués baropodométrique (BARO 2) pour vérifier la pression plantaire arrière-pied après la manipulation. Résultats: La prévalence du type et de la dysfonction part était de 57% de la dysfonction antérieur gauche (DEA), 27% de dysfonction ventriculaire droite antérieure (ADI), 10% de la dysfonction postérieur gauche (DEP) et 6% de la dysfonction postérieur droit (DDP). En ce qui concerne la prévalence de la dislocation après la manipulation de l'iliaque, 47% étaient passées à l'heure, 29% et 24% pour plus tard, est resté le même ou pas significativement différentes (> 3%). Vérifié l'efficacité de la manipulation de l'iliaque comme il est revenu à 100% de la sacro-iliaque la mobilité des patients immédiatement. Conclusion: l'arriè-pied de port de poids après la manipulation de lìliaque diminué, mais les résultats n'étaient pas statistiquement significatives.

EFECTOS DE MANEJO DE LA DISFUNCIÓN DE DESCARGA RETROPIÉ ILÍACA EN LAS PERSONAS CON DISFUNCIÓN SACRAILÍACA

RESUMEN

Introducción: La disfunción sacroilíaca (DSI) es un término utilizado para caracterizar las anomalías de posicionamiento anatómico biomecánico en una o ambas articulaciones sacroilíacas (ASI). El objetivo del estudio fue identificar posibles disfunciones de las articulaciones sacroilíacas, analizar la presión plantar del retropié través baropodometría antes y después de manipular y tratar los trastornos de las articulaciones sacroilíacas evaluado y detectado. Promover la mejora de la movilidad de la pelvis a través de la terapia de manipulación osteopática (TOM). Métodos: La muestra está compuesta por 50 estudiantes de la Universidad Estatal del Oeste de Paraná, campus de Cascavel. Llevamos a cabo pruebas específicas para diagnosticar la DSI ortopédicos son: prueba de Gillet (AV1) y prueba de Downing (AVD1). Que se encuentran algunos que se fijan en la ASI, el paciente fue evaluado con baropodometría (BARO 1), que se encuentran en la presión plantar del retropié. Luego fue la técnica de manipulación llamada ilíaca directa (TDI), calcular de nuevo la ilíaca derecha después de ellos con la prueba de Gillet (AV2) para validar o no la devolución de la biomecánica de la articulación. Se evaluaron de nuevo Baropodometric (BARO 2) para verificar la presión plantar del retropié después de la manipulación. Resultados: La prevalencia del tipo y la disfunción de la mano fue de 57% de la disfunción anterior izquierda (DEA), el 27% de la anterior disfunción ventricular derecha (IDA), el 10% de la disfunción posterior izquierda (DEP) y el 6% de la disfunción posterior derecha (DDP). En cuanto a la prevalencia de la dislocación después de la manipulación de la ilíaca, el 47% pasó antes, el 29% y 24% para más tarde sigue siendo la misma o no significativamente diferente (> 3%). Verificada la eficacia de la manipulación de la ilíaca, ya que volvió a 100% de la sacroilíaca movilidad de los pacientes inmediatamente. Concluión: La parte posterior del pie que sopotan el peso después de la manipulación de la ilíaca disminuido, pero los resultados no fueron estadísticamente significativas.

EFEITOS DA MANIPULAÇÃO ILÍACA NA DESCARGA NO RETROPÉ EM INDIVÍDUOS COM DISFUNÇÃO SACRO-ILÍACA

RESUMO

Introdução: Disfunção Sacro-ilíaca (DSI) é um termo utilizado para caracterizar anormalidades biomecânicas do posicionamento anatômico em uma ou ambas articulações sacro-ilíacas (ASI). O objetivo deste estudo foi identificar possíveis disfunções das articulações sacro-ilíacas, analisar a pressão plantar no retropé através da baropodometria, antes e depois da manipulação, e tratar as disfunções das articulações sacro-ilíacas avaliadas e detectadas. Promover a melhora da mobilidade pélvica através da terapia osteopática manipulativa (TOM). Métodos: A amostra foi composta por 50 acadêmicos da Universidade Estadual do Oeste do Paraná, campus de Cascavel. Realizou-se testes ortopédicos específicos para diagnosticar DSI sendo estes: Teste de Gillet (AV1) e Teste de Downing (AVD1). Constatado alguma fixação na ASI, o paciente foi avaliado com o Baropodômetro (BARO 1) onde foi verificado a pressão plantar no retropé. Em seguida, realizou-se a manipulação denominada Técnica Direta do Ilíaco (TDI), reavaliando o ilíaco logo na seqüência com o Teste de Gillet (AV2) para comprovar ou não a devolução da biomecânica da articulação. Foi realizada a reavaliação baropodométrica (BARO 2) para verificar a pressão plantar no retropé após a manipulação. Resultados: a prevalência do tipo e do lado da disfunção foi de: 57% de disfunção esquerda anterior (DEA), 27% de disfunção direita anterior (DDA), 10% de disfunção esquerda posterior (DEP) e 6% de disfunção direita posterior (DDP). Quanto à prevalência de deslocamento após a manipulação do ilíaco, 47% deslocou-se para anterior, 29% para posterior e 24% manteve-se igual ou não apresentou diferença significativa (>3%). Verificou-se a eficácia da manipulação do ilíaco, uma vez que devolveu a 100% dos pacientes sua mobilidade sacro-ilíaca, de imediato. Conclusão: a descarga de peso no retropé após a manipulação do ilíaco diminuiu, porém os resultados não foram estatisticamente significativos.