18 - ANALYSIS OF THE DEFORMITY'S OF KNEE AND OF Q ANGLE IN INDIVIDUAL'S CARRIERS OF CHONDROMALACIA PATELLAR.

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Introduction

The articulation patellofemoral is a major source of pain and dysfunction of the knee joint. The primary functions of the patella are to increase the effectiveness of the quadriceps muscles and provide the protection prior to the femur bone (Weber et al., 2000).

According Weber et al. (2000), the pain in the knee, or more commonly patellofemural that the pain is related to the impairment of articulation patellofemoral, is one of the pathologies of the knee that affects more people, especially athletes.

The pain in the region patellofemoral may be due to a trauma or can be insidious as occurs in the beginning of overuse injuries. After an injury or surgery of the hip, knee or ankle, the pain patellofemoral may occur due to changes in the mechanics of lower limb. It is most prevalent complications after knee surgery (Weber et al., 2000). To Nissen et al. (1998) patellofemoral pain is not fully understood. But many factors have been proposed, among them the bad alignment of the lower limbs that can generate a biomechanical imbalance and hence an increase in the angle "Q".

The biomechanical imbalance caused by postural changes will bring bad alignment of the patella on the femur (Silva 2002). Postural changes found in the knee is the knee valgus, varus, flexo and recurvatum (Calliet, 2001).

These deviations may cause changes in the functioning of the patella, which depends on a delicate balance between ligaments and muscles. Because of its instability bone and when this balance is affected, is a shift of the patella inappropriate, and the lateral deviation the most common (Weber et al., 2000). This bias in turn is caused by an imbalance between the vectors of force of the quadriceps muscle, especially when the muscle broad side is more developed than the vast muscle and medial muscle fibers wide medial oblique (Kapandji, 1990).

The lateral deviation of the patella can increase the value of the angle "Q" that can be measured. To this should be an imaginary line drawn from the anterior-superior iliac spine through the center of the patella and another line that stretches from the previous tuberosity of the tibia to the average pole of the patella. The angle "Q" is the variation between these two lines. Hebert, et al. (2003), states that the normal value of the angle Q "is 10 degrees.

The lack of normalcy to the angle "Q" certainly will have consequences in the amendment of the cartilage joint. This condition is often associated with chondromalacia patellar (Camanho, 1996). The chondromalacia patellar develops with a friction, softening, fissuring and wear of cartilage joint on the side of the patella mainly medial appearing erosions and where cracks are formed pieces of cartilage and fibrous tissue (Turek, 1991).

The symptoms of chondromalacia are related to the roar (caused by a compression and a passive movement of the patella generating a sound of great feeling of vengeance to examine), blocks (which can feel pain in the anterior aspect of the knee for not slide easily on the femoral condyles) and pain (of a deep, pain anterior , aggravated by sporting activities involving support with load in the knee bending or up and down stairs to increase compression between the femur and patella) (Thomson et al., 1994).

From the analysis of the causes of pain anterior appeared to be curious to try to elucidate if there is any association between the deformities of the knee and a greater or lesser risk of having patellar chondromalacia. This study aimed to examine the postural deformities of the knee, the angle "Q" and the relationship of these with chondromalacia patellar.

Methods and materials

For the participation of the research were selected 28 individuals totaling 56 knees, 79% of these had chondromalacia bilateral and unilateral 21%, and 61% (17) of the genus female and 39% (11) of the male, aged between 13 to 57 years, average of 28 years, they had the diagnosis of disease chondromalacia patellar, in the period from February to May of 2005.

All participants signed a term of free and informed consent, and procedures of the research were made after the approval of the Ethics Committee of University of Fortaleza - UNIFOR.

The material used is: the Scoreboard of the patient, tape measure, universal goniometer in *Brand Carci* ® and table evaluation.

On previously scheduled, the subjects of the research have been forwarded to the place of the examination, wearing the proper clothing. They were acquired personal information, body mass, stature, latch of mass body (BMI), measured the angle Q and observation of deformities of the knees.

The postural deformities were evaluated following the items below:

In the sagittal plane: The patient remains standing, keeping the feet in a position to step. The therapist palpa the region's largest femoral trochanter and marks the central point of this prominence bone, the central point between the groove of the femoral biceps and the outer edge of the patella, which corresponds approximately to the center of the femoral condyle externally. In the region of the foot therapist marks the center of the apex external and with a long slit, the therapist paves the way that meets the point corresponding to the center of the trochanter external condyle, and the way that meets the center of the apex to apex external (Santos, 2001).

The diagnosis was prepared as follows: If the surface is touch and maleollos not, the therapist notes the distance between them using a ruler, the knee is considered vague. If the maleollos touch and knees if not, notes to the distance between them by using a ruler, the knee is considered varus.

Measure the angle Q: performed with the patient in decubitus back, knee in full extension and quadriceps contracted. An imaginary line was drawn from the anterior-superior iliac spine through the center of the patella and another line that stretches from the previous tuberosity of the tibia to the average pole of the patella. We measured the angulation between those lines. It is the normal value of 10 ° (Hebert, 2003).

Test-Waldron helps diagnose the chondromalacia patellar. The individual begins this test in the upright position. While the examiner the patella, the individual is instructed to sit several deep knee or crouched a slow and controlled manner. The examiner should palpate the patella, indicating where pain is perceived in the range of motion and where it is identified a sigh. For this test is positive for chondromalacia, the pain and the crepitis should occur simultaneously. The trajectory of the patella should

also be observed during this procedure (Palmer, 2000).

The tabulation and analysis of the data were made in the SPSS statistical software (Statical Package for Social Sciencies) version 10.0, and the tests used non parametric Fisher's Exat, with a significance level of 5%.

Results

In Table 1 are shown the correlation oh chondromalacia patellar with the test Waldron, in the member with and without chondromalacia.

Table 01 – Correlation Chondromalacia Patellar with the Teste Waldron

	Teste de Waldron	
	Positivo	Negativo
Chondromalacia	11	32
Healthy	0	13

Level of significance, p= 0.039

In Tables 2 and 3 are presented correlations with patellar chondromalacia of the pain anterior, in the member with and without chondromalacia, and the correlation with patellar chondromalacia of the angle Q.

Table 02 – Correlation Chondromalacia Patellar with Retopatellar pain

	Retropatelar Pain	
	With Pain	Without Pain
Chondromalacia	28	15
Healthy	0	13

Level of significance, p<0.001

Table 03 – Correlation Q Angle With Chondromalacia Patellar

	Q Angle	
	=10°	>10°
Chondromalacia	5	38
Healty	2	11

Level of significance, p= 0.519

In Tables 4 and 5 are shown the correlation of chondromalacia patellar with deformities of the knees in the sagittal plane and in the front in the member with and without chondromalacia patellar.

Table 04 – Correlation Chondromalacia Patellar with Knee Flexo or Recurve

	Knee	
	Flexo	Recurve
Chondromalacia	32	11
Healthy	12	1

Level of significance, p=0.161

Table 05 – Correlation Chondromalacia Patellar With Knee Valgo or Varo

	Knee	
	Valgo	Varo
Chondromalacia	13	43
Healthy	4	13

Level of significance, p= 0.611

Discussion

At table 01, can be observed that there was a significant correlation of test Waldron with patellar chondromalacia. Palmer (2000) describes this as efficiently test to assess the subject bearers of chondromalacia patellar. This test possibly had positive correlation, because the way it is done makes the patella attrite with condyle femoral side, which may cause pain and simulate situations which the subject feels the pain, as extremism, up and down stairs, among other.

At table 02, it is observed that there was a significant correlation between pain anterior the chondromalacia patellar. This result was expected because the degeneration and the softening of the cartilage joint causes a synovitis and edema. The synovia is rich in supply nervous, is irritated and causes pain (Doucette and Goble 1992).

However, contrary to what expected, has been in Table 5 that there was no significant correlation between the angle "Q" and the chondromalacia. This fact may have occurred because it is believed that the change of angle "Q" does not necessarily characterizes a state of chondromalacia patellar since the angle "Q" is one of the factors that may predispose to chondromalacia patellar and not the sole cause. Moller et al. (1983) found that the majority of patients studied with pain in the patellar lacked vision axial misalignment. Melo de Paula et al. (2004) also found no statistically significant correlation between previous knee pain and increase in the angle "Q". Linvingston and Mandigo (1999) in their study evaluated 75 subjects, who were divided into three groups, asymptomatic, symptomatic unilateral and bilateral symptomatic, where they found significant differences between the right leg x left were seen by the groups (p <0, 001). Only a relationship weak, however significant angles between the "Q" D and E was noted (r = 0.53, p <0.001). There was no correlation between the measures of angle "Q" and the value of the discomfort experienced in unilateral knee pain, however when tested bilaterally happened a little correlation.

According Silva (2002) found the deviations in the knee, alter the biomechanical articulate and overload will cause the knee joint. This study was verified that most individuals presented knee flexo 79% (22), while the knee recurve occurred in only 21% (6). Meanwhile, Silva (2002) observed in his study play a predominant largest of knee recurve 63.9%. These changes found in the knee, due to overload articulate, can cause injuries and have as a consequence the chondromalacia patellar. Kapandji (2000) reports that the knee recurvatum may entail a lower cooption strength of the patella, which can off of the patella femoral trochlear, moving it sideways. The lateral displacement of the patella can cause a chondromalacia patellar. Unlike the knee flexo generates greater cooption the patella with femoral trochlear increased the pressure between the patella and the femoral condyle, which can also generate susceptibility to chondromalacia.

Unlike expected when held the correlation knee recurve or flexo with chondromalacia patellar, it has not produced significant correlation. This may have happened because the number of the sample was very small and heterogeneous both in age and in relation to gender.

On the front, to correlate the valgus and varus deformity with chondromalacia, showed no significant correlation. Indo according to studies already undertaken, as the Silva (2002) in order to examine the qualitative stance knee noted an increased prevalence of knees varus (61.1%) on the presence of knees valgus (38.9%). Melgarejo Carreón 1994, to examine the radiographs of individuals bearers of chondromalacia patellar symptomatic and asymptomatic with valgus and varus deformity in the knee, it is noted that the 30 subjects assessed: 17 owned knee valgus, these 14 had increased valgus, 5. 5; and 11 had varus, these five have more than 5 ° varus; no significant difference between asymptomatic subjects and not asymptomatic. Author, too, to correlate the angle Q with symptomatic and asymptomatic individuals, showed that there is no correlation, going to meet with our study.

Conclusion

The study showed that the test of Waldron is efficient to test the chondromalacia patellar.

The correlation between pain and chondromalacia patellar happened, as was expected. However different from the original event, there was no correlation between angle "Q" and chondromalacia patellar.

For deformity of the knee there was no relationship to the individual to develop chondromalacia patellar.

Apart from these achievements can conclude that the increase in the angle "Q" and postural deviations of the knee are not the only variables to be examined by physiotherapist in chondromalacia patellar.

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ANALYSIS OF THE DEFORMITY'S OF KNEE AND OF Q ANGLE IN INDIVIDUAL'S CARRIERS OF CHONDROMALACIA PATELLAR.

The proposal of this study was to analysis the correlation of the deformity's postural of knee and of “Q” angle with chondromalacia patellar in individual's carriers of chondromalacia patellar. The research was carried through in the sector of physiotherapy of the clinics in study in the period of February to May. Twenty-eight (28) individuals where analyzed that they possessed the diagnostic of chondromalacia patellar. Of these, 61% of feminine sex and 39% of the masculine sex, with average age of 28 years. An evaluation was performed, which was anamneses and physical examination, where this test consisted of Waldron, postural deformities evaluation of the knees and measure the angle "Q". For the analysis of the data was used to test non parametric Fisher's Exact. By making the correlation of test Waldron with chondromalacia patellar, that presented significance (p = 0,039). The same happened in pain retropatelar correlation with chondromalacia (p <0.001). When conducted on the correlation angle "Q" with chondromalacia, this has not produced significance (p = 0,519). In correlation knee flexo or recurve with chondromalacia patellar, there was no significance (p = 0,161). The same happened to make the correlation with chondromalacia patellar of the knee varus or valgus (p = 0,611). From these results we conclude that the test is Waldron efficiently to test the chondromalacia patellar, and that the increase in the Q angle and postural deformities of the knees, are not the only variables to be analyzed by the physiotherapist.

ANALYSE DES DÉFAUTS DE FORME POSTURAIS ET DE L'ANGLE "Q" DANS DES PERSONNES PORTEUSES DE CHONDROMALACIE PATELLAIRE.

À proposition de cette étude ce a été analyser corrélation des défauts de forme posturais des genoux et de l'angle "Q" avec la chondromalacie patellaire dans des idivíduos porteuses de chondromalacie patelar. La recherche a été réalisée dans le secteur de physiothérapie des clíncas le étude de février au mai. Ont été analysées 28 personnes, qui possédaient le diagnostic de chondromalacie patellaire. De ceux-ci, 61% était du sexe féminin et de 39% du sexe masculin, avec âge moyen de 28 ans. A été réalisée une évaluation, qui consistait anamnèse et examen physique, où dans celui-ci a consisté essai de Waldron, évaluation des défauts de forme porteuses des genoux et mesure de l'angle "Q". Pour l'analyse des données a été utilisé l'essai non paramétrique Fisher's Exact. À deréaliser la corrélation de l'essai de Waldron avec la chondromalacie patellaire, cette il a présenté importance (p=0.039). Le même est arrivé dans la corrélation douleur retropatelar avec la chondromalacie (p<0.001). Quand réalisée la corrélation de l'angle "Q" avec la chondromalacie, celle-ci n'a pas présenté importance (p=0.519). Déjà dans la corrélation du genou flexo ou recurvado avec la chondromalacie patellaire, n'a pas eu importance (p = 0.161). Le même s'est

produit à defaire la corrélation de la chondromalacie patelar avec le genou valgo ou échoue (p = 0.611). À partir de ces résultats nous pouvons conclure que l'essai de Waldron est eficiênte pour expérimenter la chondromalacie patelar, et que l'augmentation de l'angle Q et les défauts de forme posturais des genoux, ne sont pas les seules variables à être des analizadas par l'o physiothérapeute.

ANÁLISIS DE LAS DEFORMIDADES POSTURAIS DE LA RODILLA Y DEL ÁNGULO "Q" EN INDIVÍDUOS PORTADORES DE CONDROMALACIA DE LA RÓTULA.

La propuesta de este estudio fue analisar las deformidades posturais de las rodillas y del ángulo "Q" *vs* condromalacia de la rótula en individuos portadores de condromalacia de la rótula. La investigación se caracterizó como un estudio descriptivo, observacional y transversal. La colecta fue realizada en el sector de fisioterapia de las clínicas en estudio de febrero a mayo. Fueron analizados 28 individuos, que poseían el diagnóstico de condromalacia, donde estés respondieron a una ficha de evaluación en la cual constaba anamnesia y examen físico. Estés, 61% eran del sexo femenino y 39% del sexo masculino, con edad media de 28 años. El ángulo "Q" varió entre 10° a 20°, con media de 13,6º. Al realizar el análisis de la posible relación entre el ángulo "Q" y la condromalacia de la rótula bilateral, podemos decir que el propio no tiene correlación (p= 0,4685), lo mismo se puede decir del ángulo "Q" y la condromalacia de la rótula unilateral (p= 0,8539), pero la correlación entre el sexo femenino y la rodilla flexo, fue concluido con 95% de seguridad, que los valores observados de las variables nos permiten inducir que existe implicación entre ellas (p=0,0265). Lo mismo sucedió en la relación sexo femenino y rodilla varo (p=0,0019). Al realizar el análisis de la posible relación entre la edad y las deformidades anatómicas de la rodilla tanto en el plano frontal como en el sagital atreves de los tests no parametritos que resultó en elevados valores de los parámetros (rodilla flexo p=0,7578); (rodilla recurvado p=0,2231); (rodilla valgo p= 1); (rodilla varo p=0,2231), lo que puede nos inducir, con 95% de seguridad que la edad parece no influenciar. De acuerdo con los resultados este nos induce a decir que no hay correlación entre el ángulo "Q" y la condromalacia de la rótula, y que los individuos con rodilla recurvada están mas susceptibles a desenvolver la condromalacia de la rótula de los que poseen rodilla flexo.

ANÁLISE DAS DEFORMIDADES POSTURAIS E DO ÂNGULO "Q" EM INDIVÍDUOS PORTADORES DE CONDROMALÁCIA PATELAR.

A proposta deste estudo foi analisar correlação das deformidades posturais do joelhos e do ângulo "Q" com a condromalácia patelar em idivíduos portadores de condromalácia patelar. A pesquisa foi realizada no setor de fisioterapia das clíncas em estudo de fevereiro à maio. Foram analisados 28 indivíduos, que possuíssem o diagnóstico de condromalácia patelar. Destes, 61% eram do sexo feminino e 39% do sexo masculino, com idade média de 28 anos. Foi realizada uma avaliação, a qual constava anamnese e exame físico, onde neste constou teste de Waldron, avaliação das deformidades posturais dos joelhos e medida do ângulo "Q". Para a análise dos dados foi utilizado o teste não paramétrico Fisher's Exact. Ao realizar a correlação do teste de Waldron com a condromalácia patelar, esse apresentetou significância (p= 0.039). O mesmo aconteceu na correlação dor retropatelar com a condromalácia (p<0.001). Quando realizada a correlação do ângulo "Q" com a condromalácia, esta não apresentou significância (p= 0.519). Já na correlação do joelho flexo ou recurvado com a condromalácia patelar, não houve significância (p= 0.161). O mesmo ocorreu ao fazer a correlação da condromalácia patelar com o joelho valgo ou varo (p= 0.611). A partir desses resultados podemos concluir que o teste de Waldron é eficiênte para testar a condromalácia patelar, e que o aumento do ângulo Q e as deformidades posturais dos joelhos, não são as únicas variáveis a serem analizadas pelo o fisioterapeuta.