139 - PEAK TORQUE COMPARATION ISOKINETIC QUADRICEPS IN DOMINANT MEMBER AND NOT DOMINANT WITH AND WITHOUT FUNCTIONAL BANDAGE APPLICATION

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INTRODUCTION

The isokinetic dynamometer quantify parameters such as production capacity for torque, power, fatigue muscles and generating work for several muscles and is very important, the evidence provide objective that means the quantifying existing levels of muscular strength and became useful as a tool for diagnosis. (AMATUZZI, 2004; PRENTICE; VOIGHT, 2003).

The Examination of isokinetic knee, also to review or for rehabilitation can utilize angular velocities typically between 30°/s 300°/s. For the best study of peak torque (PT), it uses slow angular velocity, because the less the speed the higher the torque (DVIR, 2002; TERRENI et al., 2001).

The Kinesio tape, invented by Kenzo Kase in 1996, is an application that are elastic band that can be stretched up to 120-140% of its original length, without restrictions on the mechanism of contraction, reducing swelling, pain and spasms with larger use that prevents the injuries, the therapeutic effect of minimizing knee pain, increased muscle strength and improve gait pattern. (COOLS et al. 2002; HALSETH et al.;) 2004.

Before the questionnaires, it is important to analyze indicators for validity, reproducibility and specify the population that will be used, in this case the procedure of data processing the objectives for the assessment of energy expenditure or physical activity.

With regard to the options available for assessing levels of habitual physical activity, depending on the need and the criteria of standardization, recently the International Physical Activity Questionnaire (International Physical Activity Questionnaire - IPAQ) (GUEDES et al., 2005) receives special attention .

The study have the aim to analyze the behavior of the PT of the extensors knee with and without the application of taping evaluated in the volunteers.

METHODS

The research is a qualitative and quantitative that is conducted through an isokinetic evaluation with active volunteers. Data were obtained on the premises of UENP - CCS, more specifically in the Laboratory of Physical Assessment, where the evaluations were realiazed.

Before evaluation applied at the International Physical Activity Questionnaire (IPAQ) to check the level of activity at the volunteers.

The sample contained 10 active male volunteers aged 21.1 ± 2.1, weight of 78.1 kg and height of 1.76 m. Submitted twice to the same protocol of isokinetic evaluation, one week of break.

The first evaluation was performed without the application of taping, called CONCENTRIC FUNCTIONAL (FC), forming the Concentric Group (CG). In the second evaluation, performed was with them, began FUNCTIONAL BANDAGE (FB) where the application was done by taping, named Banding Group (GB).

During the second review the application of taping was done correctly by a professional with training on "Functional Elastic Bandage Course - Physio Taping Method. The method used was specific for strength increase with 25% and 50% strain placed on the taping the rectus femoris muscle of origin for insertion into the superior of the patella (Kase et al. 2003)

The evaluations were performed using an isokinetic dynamometer brand Biodex Medical Systems ® 4, model Biodex Multi-Joint System PRO ™.

We adopted some procedures and behaviors to guarantee the true of data (experience of the evaluator, the dynamometer calibration, temperature control and environment, rest of ratings), and the conditions of the volunteer (previous meal in a period of more than two hours, not present physical fatigue or signs of neurological, sensory and motor deficits).

Calibration was performed before the start of the assessments conducted and the heating cycle ergometer Monark ®, with an intensity of 50 Joules, where the volunteer maintains the speed between 20 to 25 km / h for 10 minutes.

The volunteer was positioned in the chair with the spine upright backrest fully supported in 90 ° of hip flexion, 90 ° of knee flexion. The equipment fixing was obtained by two tracks on the thorax, a track in the region of iliac crests, a track that sets the member evaluated in the thigh area to avoid compensatory movements and finally a track placed two fingers above the calcaneus fixation for distal .



Figure 1: Positioning and attachment
Source: Own

Before starting the test, the volunteers performed three submaximal repetitions to familiarize themselves with the procedures.

We used the isokinetic concentric / concentric (CON / CON), with protocol flexion and knee extension, initiated by the dominant member. Evaluations were bilateral at a speed of 60 °/ s with 5 consecutive maximum repetitions .

After the evaluation of isokinetic was make one performance at 2 sets of 30 seconds of passive static stretching and then compressive cryotherapy for 15 minutes on his knees.

The data were analyzed using the software BioEstat 5.0. The test was used with normality Shapiro-Wilk for the data parametric found at this time we used the Student T test. The analysis was performed between GC and GB.

RESULTS

Individuals were classified as actives, obtaining frequency (F) of moderate physical activity ≥ 5 days / week and duration (D) activity ≥ 30 min / day (min / day).

Table 1 - Amounts related to the frequency and duration of the physical activity level of individuals.

Walk		Moderate		Vigorous		Rating
F (days)	D (min)	F (days)	D (min)	F (days)	D (min)	ACTIVES
5	90	5	138	2	96	

Fonte: Própria

No significant differences p = NS between GC and GB both as MD for MND. The average PT GC for MD was 213.6 Nm and 212.9 Nm of the MND group GB For the average PT was 207.9 Nm and 206.5 Nm for MD and MND respectively. As shown in Table 2

Table 2 – Average Peak Torque of GC e BO

Average of PT	N.m	*P*	Differences (%)
MD GC	213,6		
MD BO	207,9	*p*=NS	2,6%
	212,9		
MÑD BO	206,5	*p*=NS	3%

Fonte: Própria

DISCUSSION

Evidences of using the taping was increasing concentric PT is still not known in the literature. Furthermore, the standardization and application of tests evaluated variety of speeds can lead to inconsistency between the results, making the comparison studies of the same nature. (TERRERI et al. 2001)

It is known that the sense of applying bandage influence on muscle tone, is in favor of applying the origin and insertion of the muscles evaluated. Regarding the application, the present study used the bandage in the origin of insertion of the quadriceps muscle with maximum voltage of 25-50% of its length (KASE, et al., 2003). In another study, Wong et al. (2012), applied in the same direction with a voltage of 75% of its length. Stefano Vercelli et al. (2012) placed the bandage below the origin of the rectus femoris without tension, mild to moderate (25% -50%) over the tape and the end of the two tails, without tension. The same occurred with Fu et al. (2007), the application was the dominant hand Y-shaped, but the tape was stretched to 120%. The three studies used the same application protocol that the present study, but in a different application, which was, taken from the original manual of Kase et al. (2003). Although these studies use different application forms, also showed no differences in concentric isokinetic PT increased.

These studies corroborate other authors found no increase in concentric isokinetic PT compared with and without use of banding functional. (VITHOULK et al., 2010; WONG et al., 2012).

However the bandage has other therapeutic effects. According Murray (2001) suggested as a possible proprioceptive facilitator in the acute phases of the process of lesion. In another study, the same author explains about the condition of taping a significant improvement in range of motion in individuals with reconstruction of the anterior cruciate ligament (ACL). Zajt-Kwiatkowska et al., (2007), a study was realized with the application of taping in sports injuries, where he found a significant decrease in pain, increase functional capacity, and reduced visible edema, thus concluding that the bandage is a good complementary method to physical therapy.

The effectiveness of functional banding is increasing in strength muscle that needs further investigation, therefore, applying the same towards a performance improvement was not supported by the current results, however the taping shows other therapeutic effects. According Murray (2001) suggested as a possible proprioceptive facilitator in the acute phases of the process of lesion. In another study, the same author explains about the condition of taping a significant improvement in range of motion in individuals with reconstruction of the anterior cruciate ligament (ACL). Zajt-Kwiatkowska et al., (2007), conducted a study with the application of taping in sports injuries, where he found a significant decrease in pain, increase functional capacity, and reduced visible edema, thus concluding that the bandage is a good complementary method to physical therapy.

CONCLUSION

Observed reliability and reproducibility of the results and there was no significant differences in concentric isokinetic peak torque of quadriceps active individuals when using functional bandage.

It is suggested that studies be conducted with a larger sample and standardizing the protocol application for better results.

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PEAK TORQUE COMPARATION ISOKINETIC QUADRICEPS IN DOMINANT MEMBER AND NOT DOMINANT WITH AND WITHOUT FUNCTIONAL BANDAGE APPLICATION

ABSTRACT

Introduction and object: The isokinetic dynamometer quantify parameters like torque production , muscular potential, fatigue and several muscular work, that becomes one important tool to highlight and provides objects to trace diagnostics. The Kinesio Tape is an application through a tape that can be stretched without restriction to the mechanism of contraction, dropsy reduction, pain and spasm with high utilization at prevention at e injuries. Therefore, analyzing the behavior of knee extenders muscles with or without functional bandage application. Methods: The sample contained 10 active volunteers, with 21,1 ± 2,1 years, 78,1kg e 1,76m, that was submitted twice to the protocol of isokinetic concentric evaluation of 60°/s to get the PT, compost by 4 steps, called heating, familarisation, evaluation and cooling, with one week of break and evaluations, the first application without functional bandage called Concentric Fase compost for the Concentric Group (GC) and the second application with functional bandage, called Bandage Fase, compost by the Bandage Group (GB). The data were analyzed in a software. BioEstat 5.0, working with normal test Shapiro-Wilk, parametrics values found in this moment used T Student test for analyzes between group GC and GB. Results: Didn't have differences p=NS, between GC and GB, both at dominant member (MD), both at not dominant member (MÑD). The average of PT and GC to the MD was 213,6 Nm and for MÑD was 212,9 Nm. For the GB group the average of PT was 207,9 Nm and 206,5 Nm to MD and MÑD. Conclusion: Not Observed differences between concentric isokinetic PT of the volunteers quadriceps when was used Functional Bandage. It is suggested for the work realization one big sample and one protocol patronization for better results.

KEYWORDS: Bandage, isokinetic, quadriceps.

COMPARAISON QUADRICEPS POINTE DE COUPLE ISOCINÉTIQUE MEMBRE DE DOMINANTE AVEC ET NON DOMINANTE ET SANS APPLICATION FONCTIONNELLE DE BANDAGE.

RÉSUMÉ

Introduction et objectif: Le dynamomètre isocinétique quantifier les paramètres tels que la production de couple, la force musculaire, de la fatigue et de travailler plusieurs groupes musculaires à devenir un outil important pour mettre en évidence et de fournir des moyens objectifs de retracer et de diagnostics. Le ruban Kinesio est appliquée par l'intermédiaire d'une bande qui peut être étiré sans restrictions sur le mécanisme de la contraction, ce qui réduit l'enflure, la douleur et les spasmes largement utilisé dans la prévention des blessures. L'intuition est donc d'analyser le comportement des muscles extenseurs du genou avec et sans application de ruban adhésif. Méthodes: L'échantillon contenait 10 bénévoles actifs, à 21,1 ± 2,1 ans, 78,1 kg et 1,76 m Soumis le double concentrique protocole d'évaluation isocinétique à 60 ° / s pour obtenir un couple de pointe (PT), composé de 4 étapes appelées chauffage, la familiarisation, d'évaluation et de refroidissement, avec une semaine d'intervalle entre les

évaluations, la première sans l'application de la phase enregistrement intitulé composée par Concentric Concentric Groupe (GC) et la seconde avec l'application du droit taping Bandage phase, Bandage faite par le Groupe (GB). Les données ont été analysées dans le logiciel BioEstat 5.0., Utilisant le test de normalité de Shapiro-Wilk, les données paramétriques trouvés à ce moment, nous avons utilisé le test t de Student pour l'analyse entre GC et GB. Résultats: Aucune différence significative p = NS entre GC et GB à la fois la dominante (MD) pour le membre non dominant (MND). La moyenne PT GC pour MD était 213,6 212,9 Nm Nm et de la GB MND groupe Pour la moyenne était de 207,9 Nm PT et 206,5 Nm pour MD et la DMN respectivement . Conclusion: Il y avait pas de différences dans PT bénévoles concentriques quadriceps isocinétiques utilisés lors de ruban adhésif. IL est suggéré d'effectuer des travaux d'échantillon plus large et la normalisation du protocole d'application pour obtenir les meilleurs résultats.

MOTS-CLÉS: Bandage, quadríceps, isocinétiques.

CUADRICEPS COMPARACIÓN TORQUE PICO ISOCINÉTICO EN MIEMBRO CON DOMINANTES Y NO DOMINANTES-Y SIN APLICACIÓN FUNCIONAL DE VENDAJE.

RESUMEN

Introducción y objetivos: El dinamómetro isocinético cuantificar parámetros como el par de salida, la fuerza muscular, la fatiga y trabajar varios grupos musculares para convertirse en una herramienta importante para destacar y proporcionar medios objetivos para rastrear y diagnósticos. La cinta Kinesio se aplica a través de una cinta que puede ser estirado sin restricciones en el mecanismo de contracción, la reducción de inflamación, dolor y espasmos en amplio uso en la prevención de lesiones. La intuición es, por tanto, analizar el comportamiento de los músculos extensores de la rodilla con y sin aplicación de grabación. Métodos: La muestra contenía 10 voluntarios activos, con 21,1 ± 2,1 años, 78,1 kg y 1,76 m Enviado protocolo isocinético concéntrico evaluación dos veces a 60 º / s para la obtención de par máximo (PT.), compuesto por 4 pasos llamados calefacción, la familiarización, la evaluación y la refrigeración, con intervalo de una semana entre las evaluaciones, la primera sin la aplicación de la fase de grabación titulada compuesto por concéntrico concéntrico Group (CG) y el segundo con la aplicación de la grabación titulada Vendaje fase, Venda hecha por el Grupo (GB). Los datos fueron analizados con el software BioEstat 5.0., Mediante la prueba de Shapiro-Wilk normalidad, los datos paramétricos se encuentran en este momento se utilizó la prueba t de Student para el análisis entre CG y GB. Resultados: No se observaron diferencias significativas p = NS entre GC y GB tanto en la dominante (MD) en cuanto a la extremidad no dominante (MND). El promedio de PT para GC MD fue 213,6 Nm y 212,9 Nm de la GB grupo MND Para el promedio de PT fue 207,9 Nm y 206,5 Nm para MD y MND respectivamente . Conclusión: No hubo diferencias en los voluntarios PT isocinéticos concéntricos cuádriceps utilizados al grabar. Se sugiere llevar a cabo un trabajo con una muestra más grande y estandarizar el protocolo de aplicación para obtener los mejores resultados.

COMPARAÇÃO DE PICO DE TORQUE DE QUADRÍCEPS EM MEMBRO DOMINANTE E NÃO DOMINANTE COM E SEM A APLICAÇÃO DE BADANGEM FUNCIONAL

RESUMO

Introdução e Objetivo: O dinamômetro isocinético quantifica vários parâmetros como a produção de torque, potência muscular, fadiga e trabalho muscular, tornando-se uma importante ferramenta para evidenciar e fornecer meios para traçar diagnósticos. O Kinesio Tape é uma aplicação através de uma fita que pode ser esticada sem restrição ao mecanismo de contração, apresentando com efeito terapêutico a redução de edema, dor e espasmo, com alta utilização na prevenção de lesões. Portanto, justifica-se a importância de se analisar o comportamento dos músculos extensores do joelho com e sem aplicação de bandagem funcional. Metodologia: A amostra conteve 10 voluntários ativos, com 21,1 ± 2,1 anos, 78,1 kg e 1,76 m, submetidos duas vezes ao protocolo de avaliação isocinética concêntrica de 60 °/s para obtenção do PT, composto por 4 etapas, denominadas aquecimento, familiarização, avaliação e resfriamento, com uma semana de intervalo entre avaliações. A primeira avaliação sem a aplicação da bandagem funcional chamado Fase Concêntrica compondo o Grupo concêntrico (GC) e segunda avaliação com a aplicação da bandagem funcional, intitulada Fase Bandagem, compondo o Grupo Bandagem (GB). Os dados foram analisados através do software BioEstat 5.0. Utilizou-se o teste de normalidade Shapiro-Wilk, para os dados paramétricos encontrados nesse momento usou-se o teste T Student para análise realizada entre os grupos GC e GB. Resultados: Não houve diferenças significativas p=NS, entre GC e GB tanto em membro dominante (MD) quanto para o membro não dominante (MÑD). A média do PT da GC para o MD foi de 213,6 Nm e para o MÑD de 212,9 Nm. Para o grupo GB a média do PT foi de 207,9 Nm e 206,5 Nm para MD e MÑD, respectivamente. Conclusão: Não se observou diferenças significativas no pico de torque concêntrico isocinético de quadríceps de indivíduos ativos quando utilizado bandagem funcional. Sugere-se que sejam realizados trabalhos com uma amostra maior e padronização no protocolo de aplicação a fim de melhores resultados.

PALAVRAS-CHAVE: Bandagem, isocinético, quadriceps.