IPNFA ® RESEARCH COMMITTEE NEWSLETTER

INTERNATIONAL PNF ASSOCIATION by IPNFA®

FEBRUARY 2024

Dear IPNFA®Members, Dear Friends

We present the next IPNFA® Newsletter prepared by the Research Committee. Below you will find the newest articles approved by the members of our committee. You can find also information about newest events in the field of our PNF. Enjoy by reading it

NEW PNF BOOK BY GEN MATSUDA

Our colleague, Gen Matsuda, has finished work over new PNF book. It is available in Japanese and will be translated into Chinese and Korean. Title : Clinical usefull PNF.

Good Job Gen ! 頑張れ松田さん !

IPNFA POLAND ORGANISES PNF WORKSHOPS FOR ACADEMIC STUDENTS

November 25 2023, there were inspiring workshops for students organized by our Association!

🎓 In Warsaw we had the pleasure of hosting students from several renowned universities. For several fascinating hours, we explored the secrets of gait disorders in various patients and discussed the possibilities of therapeutic approaches to improving gait. 🚶 We also discussed the specificity of individual walking phases, and an interesting addition to the workshops were practical classes, during which we presented therapeutic suggestions and exercised together with the participants! 💪

IPNFA Poland represented by: Agnieszka Stępień, Katarzyna Fountoukidis Polańska, Monika Piwnicka, Joanna Jaczewska Bogacka, Kuba Marciński

Exercise-Induced Hypoalgesia Following Proprioceptive Neuromuscular Facilitation and Resistance Training Among Individuals With Shoulder Myofascial Pain: Randomized Controlled Trial.

Xu ZH, An N, Wang ZR.

JMIRx Med. 2022 Dec 27;3(4):e40747. doi: 10.2196/40747.

MID: 37725522; PMCID: PMC10414395.

Abstract

Background:

Various exercises can attenuate pain perception in healthy individuals and may interact with the descending pain modulation in the central nervous system. However, the analgesic effects of exercise in patients with myofascial pain can be disrupted by the pathological changes during chronic pain conditions. Thus, the exercises targeted on the facilitation of the sensory-motor interaction may have a positive impact on the restoration of the descending pain modulation and the analgesia effects.

Objective:

This paper estimates the effect of proprioceptive neuromuscular facilitation (PNF) and resistance training on exercise-induced hypoalgesia (EIH) and conditioned pain modulation (CPM) among patients with myofascial pain syndrome.

Methods:

A total of 76 female patients with myofascial pain syndrome (aged 18-30 years), with the pain in the upper trapezius and a visual analog scale score of greater than 30/100 mm, were enrolled in the study. Participants were randomly assigned into 3 intervention groups, including isometric (n=18, 24%), isotonic (n=19, 25%), and PNF (n=20, 26%) exercises, as well as 1 control group (n=19, 25%) with no intervention. Pressure pain threshold and the CPM responses at the myofascial trigger point, arm, and leg sites were assessed before and after the exercise session. The effective EIH response was reflected in the improvement of pressure pain thresholds.

Results:

There was an increase in pressure pain thresholds and CPM responses at trigger point (P<.001 and P<.001), arm (P<.001 and P<.001), and leg sites (P<.001 and P=.03) in participants who performed PNF and isotonic exercise, while the isometric exercise only increased pressure pain thresholds at leg sites (P=.03). Compared with the control group, both the isotonic (P=.02) and PNF (P<.001) groups showed greater EIH responses at the trigger points. In comparison to the control group, only the PNF exercise (P=.01) significantly improved pressure pain thresholds and CPM responses at arm and leg sites compared to the control group.

Conclusions:
PNF, isotonic, and isometric exercises could lead to local and global EIH effects. The improvement in CPM response following PNF and isotonic exercises suggested that the EIH mechanisms of different resistance exercises may be attributed to the enhancement of the endogenous pain modulation via the motor-sensory interaction from the additional eccentric and dynamic muscle contraction.

Trial Registration:
Chinese Clinical Trial Registry ChiCtr2021110908191661 65; https://tinyurl.com/2ab93p7n

JMIRx Med 2022;3(4):e40747

doi:10.2196/40747

Case Reports J Phys Ther Sci
2017 Jan;29(1):163-167. doi: 10.1589/jpts.29.163. Epub 2017 Jan 30.

The effects of therapeutic exercise using PNF on the size of calcium deposits, pain self-awareness, and shoulder joint function in a calcific tendinitis patient: a case study

Dong-Gun Oh , Kyung-Tae Yoo
Affiliations expand

PMID: 28210065 PMCID: PMC5300831 DOI: 10.1589/jpts.29.163

Abstract

[Purpose] The purpose of this case study was to identify the effects of independent and intensive therapeutic exercise using Proprioceptive neuromuscular facilitation on the size of calcium deposits, pain self-awareness, and shoulder joint function in a patient with calcific tendonitis.

[Subject and Methods] The subject was a 42-year-old female patient with calcific tendonitis and acute pain who had difficulty with active movement and problems with general function. The independent and intensive Proprioceptive neuromuscular facilitation exercise was applied for 40 min twice a day five times a week for two weeks for a total of 20 times. An X-ray, the visual analog scale, a simple shoulder test, the Constant-Murley Scale, and passive range of motion was used to evaluate the patient's change.

[Results] The size of the calcium deposit, the visual analog scale score, and the simple shoulder test score decreased. The Constant-Murley Scale score and the passive range of motion were increased.

[Conclusion] The results of this study suggested that intensive and independent therapeutic short-term exercise without any other exercise reduced pain and produced positive effects in shoulder function in a patient with the calcific tendonitis, which could confirm the importance of therapeutic exercise in the treatment of calcific tendonitis.

Effects of conventional physical therapy with and without proprioceptive neuromuscular facilitation on balance, gait, and function in patients with Parkinson's disease

Tahzeeb Mazhar , Ayesha Jameel , Faiza Sharif , Momna Asghar

Randomized Controlled Trial J Pak Med Assoc.
2023 Jun;73(6):1280-1283. doi: 10.47391/JPMA.6710.

Abstract

Objective:

The study was conducted at University of Lahore Teaching Hospital and Sir Ganga Ram Hospital, Lahore, using non-probability convenience sampling. Thirty-eight patients of Parkinson's disease were allocated by randomisation into two groups.

Methods: PNF Group (group A) performed proprioceptive neuromuscular facilitation incorporated with conservative treatment, while for the conventional therapy group (group B) only conservative treatment was followed. Berg Balance Scale, Freezing of Gait questionnaire, and Functional Independence measure were used as outcome measuring tool.

Results:

Berg balance scale values were significantly improved in group A at 12th week as compared to group B. Freezing of gait and functional independence was more significantly reduced in group A at sixth and 12th week as compared to group B.

Conclusion:

Hence, it is concluded that Proprioceptive neuromuscular facilitation combined with routine treatment regime improves balance, gait, and function of Parkinson's patients more effectively as compared with routine treatment protocol only.

Keywords: Balance, Functional Independence, Gait, Parkinson disease, Proprioceptive Neuromuscular Facilitation..

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Keywords: Balance, Functional Independence, Gait, Parkinson disease, Proprioceptive Neuromuscular Facilitation..

Nafees K, Baig AAM, Ali SS, Ishaque F. Dynamic soft tissue mobilization versus proprioceptive neuromuscular facilitation in reducing hamstring muscle tightness in patients with knee osteoarthritis:
a randomized control trial. BMC Musculoskelet Disord. 2023 Jun 2;24(1):447.
doi: 10.1186/s12891-023-06571-y. PMID: 37268961; PMCID: PMC10236696.

Abstract

Background

Objective

Knee osteoarthritis (KOA) considered as one of the most common degenerative diseases of synovial joint. KOA is mostly managed by physical therapy, focused on pain management, the range of motion and muscle strengthening but muscle flexibility is usually neglected. A study was conducted to evaluate the effectiveness of dynamic soft tissue mobilization (DSTM) in comparison with the proprioceptive neuromuscular facilitation (PNF) stretching in the management of hamstring tightness, reduction of pain intensity and improvement of physical functionality in KOA.

Methods

Forty eight patients with KOA were randomly allocated to group A receiving DTSM and group B receiving PNF stretching. The cryotherapy and isometric strengthening exercises were also given to both groups. Total treatment duration consisted of 4 weeks, 3 sessions per week and total 12 sessions per patient. Each treatment session comprised of 30 min. At baseline and post treatment, Active knee extension test(AKET), Visual analogue scale (VAS), and Knee Injury and Osteoarthritis Outcome Score (KOOS) were used to assess hamstring flexibility, pain intensity level and physical functional capability respectively. The continuous variables were shown as mean and standard deviations. For the comparison of outcome within and between groups, paired sample and independent t-test was applied. Considerable p value was less than 0.05.

Results

The between group analysis of VAS, right AKE test, and left AKE test showed non-significant ($p > 0.05$) mean difference as 0.2 (95% CI= -0.29, 0.70), 1.79 (95% CI= -1.84, 4.59), 1.78 (95% CI= -1.6, 5.19) respectively. KOOS domains of symptom, pain, ADLs, sports and recreational, and quality of life had also non-significant ($p > 0.05$) mean difference as 1.12 (95% CI= -4.05, 6.3), -5.12 (95% CI= -12.71, 2.46), -2.55 (95% CI= -7.47, 2.38), -2.7 (95% CI= -9.72, 4.3), and – 0.68 (95% CI= -7.69, 6.36) respectively. Significant ($p < 0.001$) improvement was shown in both groups for all outcome measures after 12 sessions.

Conclusion

DSTM and PNF stretching, both treatments are equally beneficial in KOA for hamstring flexibility, pain reduction and functional mobility in terms of AKET, VAS, and KOOS respectively.

Chronic effects of stretching on range of motion with consideration of potential moderating variables: A systematic review with meta-analysis.

Konrad A, Alizadeh S, Daneshjoo A, Anvar SH, Graham A, Zahiri A, Goudini R, Edwards C, Scharf C, Behm DG.

J Sport Health Sci. 2023 Jun 8:S2095-2546(23)00057-1. doi: 10.1016/j.jshs.2023.06.002. Epub ahead of print. PMID: 37301370.

Abstract

Objective:

Background: It is well known that stretch training can induce prolonged increases in joint range of motion (ROM). However, to date more information is needed regarding which training variables might have greater influence on improvements in flexibility. Thus, the purpose of this meta-analysis was to investigate the effects of stretch training on ROM in healthy participants by considering potential moderating variables, such as stretching technique, intensity, duration, frequency, and muscles stretched, as well as sex-specific, age-specific, and/or trained state-specific adaptations to stretch training.

Methods: We searched through PubMed, Scopus, Web of Science, and SportDiscus to find eligible studies and, finally, assessed the results from 77 studies and 186 effect sizes by applying a random-effect meta-analysis. Moreover, by applying a mixed-effect model, we performed the respective subgroup analyses. To find potential relationships between stretch duration or age and effect sizes, we performed a meta-regression.

Results: We found a significant overall effect, indicating that stretch training can increase ROM with a moderate effect compared to the controls (effect size = -1.002; Z = -12.074; 95% confidence interval: -1.165 to -0.840; $p < 0.001$; $I2 = 74.97$). Subgroup analysis showed a significant difference between the stretching techniques ($p = 0.01$) indicating that proprioceptive neuromuscular facilitation and static stretching produced greater ROM than did ballistic/dynamic stretching. Moreover, there was a significant effect between the sexes ($p = 0.04$), indicating that females showed higher gains in ROM compared to males. However, further moderating analysis showed no significant relation or difference.

Conclusion: When the goal is to maximize ROM in the long term, proprioceptive neuromuscular facilitation or static stretching, rather than ballistic/dynamic stretching, should be applied. Something to consider in future research as well as sports practice is that neither volume, intensity, nor frequency of stretching were found to play a significant role in ROM yields.

Keywords: Flexibility; Long-term stretching; Stretch training.

Effect of proprioceptive neuromuscular facilitation and cranio-cervical flexor training on pain and function in chronic mechanical neck pain: A randomized clinical trial

Vaishnavi Suresh, Prem Venkatesan, Karthik Babu

Randomized Controlled Trial Physiother Res Int
. 2024 Jan;29(1):e2058. doi: 10.1002/pri.2058. Epub 2023 Nov 6.

Abstract

Background: Chronic neck pain is known to be caused by the weakness of the deep neck flexors and disturbances in the mechanoreceptors and the proprioceptors of the cervical spine. Proprioceptive neuromuscular facilitation (PNF) is hypothesized to balance the relative stiffness and weakness of the muscles and activate the mechanoreceptors and proprioceptors.

Objective: To investigate PNF techniques and the craniocervical flexor training (CCFT) techniques for pain and function in chronic neck pain.

Methods: A randomized clinical trial was conducted on 66 chronic mechanical neck pain patients randomly assigned to either the PNF or CCFT groups using block randomization for a duration of 4 weeks. Numerical Pain Rating Scale (NPRS), Neck disability Index (NDI) and Active cervical range of motion (ACROM) were measured at baseline and after 4 weeks of intervention. Data were analysed using independent t test and MANOVA.

Results: The mean difference scores for NPRS and NDI were 2.18 and 15.72 in PNF group and 2.26 and 15.76 in the CCFT groups, respectively. Both the groups showed a change that was statistically significant. Also, the mean differences for the ACROM in all the planes in both the groups were statistically significant. However, the between group changes did not reveal any statistical significance in this study except for the right rotation in the CCFT group ($p = 0.01$).

Conclusions: This study concluded that the PNF treatment is also beneficial to pain and function in treating chronic mechanical neck pain patients as its results stand similar to the CCFT treatment, which is already established to be a reliable tool to treat this condition.

Keywords: chronic mechanical neck pain; craniocervical flexor training; proprioceptive neuromuscular facilitation.

Efficacy of proprioceptive neuromuscular facilitation on functioning in patients with bilateral hip osteoarthritis: A pilot randomized controlled trial

Alessandro de Sire, Nicola Marotta , Riccardo Spanó , Stefano Fasano, Maria Sgro, Lorenzo Lippi , Marco Invernizzi , Antonio Ammendolia

J Back Musculoskelet Rehabil. 2023 Oct 25. doi: 10.3233/BMR-230148. Online ahead of print.

Abstract

Background: Hip osteoarthritis (OA) is a chronic progressive disease that impresses a noticeable burden to society and healthcare systems. Physical exercise constitutes the first-line hip OA treatment approach, nevertheless, there is currently no gold standard method to treat this disease.

Objective: To evaluate the efficacy of proprioceptive neuromuscular facilitation (PNF) on functioning in patients with hip OA.

Method: A pilot randomized controlled trial (RCT) was carried out on patients with painful bilateral hip OA with a body mass index (BMI) < 30 kg/m2. After the randomization, the experimental group was treated with PNF protocol and the control group with conventional physical therapy (10 sessions of manual therapy, 5 sessions/week for 2 weeks). The Harris Hip Score (HHS) was the primary outcome, whereas we assessed as secondary outcomes: pain, range of motion, and muscle strength of hip, physical performance, and quality of life.

Results: Twenty patients (40 hips) were enrolled and randomized into two groups: PNF group (mean age: 70.7 ± 8.07; BMI: 25.1 ± 3.07; 7 females and 3 males) and control group (mean age: 74.9 ± 10.72; BMI: 26.8 ± 3.78; 6 females and 4 males). The results showed a statistically significant improvement of HHS in the study group (T1: 90.6 ± 5.63) than in the control group (T1: 77.3 ± 10.9) (between-group p value < 0.001). Three months after the treatment we have statistically significant maintenance in the PNF group (T2:89.6±6.32, within-group ΔT0-T2 p< 0.01) while the control group did not maintain the improvements recorded at T1 (T2: 71.4 ± 15.8).

Conclusion: The results of this pilot RCT showed that incorporating PNF exercises into the rehabilitation program yielded notable enhancements in improving lower limb function, strength and ROM in hip OA patients. Nonetheless, further prospective studies including wider sample size are needed to implement scientific knowledge on this physical therapy approach, in patients with hip osteoarthritis.

Keywords: Osteoarthritis; pain; physical therapy; proprioceptive neuromuscular facilitation; rehabilitation.

The effect of proprioceptive neuromuscular facilitation technique on treating cervical radiculopathy

ARBNORE IBRAHIMAJ GASHI , TINE KOVAČIČ , FEIM GASHI , ARJETA AZEMI

Journal of Physical Education and Sport ® (JPES), Vol. 23 (issue 3), Art 89, pp. 722 - 729, March 2023 online

ISSN: 2247 - 806X; p-ISSN: 2247 – 8051; ISSN - L = 2247 - 8051

DOI:10.7752/jpes.2023.03089

Abstract

Objective:

Electronic products such as computers and cell phones have raised the prevalence of cervical radiculopathy (CR). As the sedentary life of the population is increasing as well as the disorders in the cervical region, it is necessary to explore more effective ways of specific physiotherapeutic treatment protocols.

Methods:

This study aims to compare two different physiotherapeutic protocols for CR. This is a prospective nonrandomized research study, conducted in the Center For Physical Therapy and Rehabilitation "Banja Kllokotit", and the private clinic Fizio -Ana in Ferizaj, Kosovo, in 2022. The ethical approval was received by the rehabilitation center (no. 01/22) from the Kosovo Chamber of physiotherapists (no. 169), and the patients also provided informed consent. These are preliminary findings, and thirty patients of ages 20 to 80 were used. In the test group (N = 15), passive mobilizations, proprioceptive neuromuscular facilitation (PNF) contract-relax technique, cupping massage, thermotherapy, and transcutaneous electrical nerve stimulation were applied. The control group (N = 15) combined isometric-strengthening exercises and passive stretching with electrotherapy and hydrotherapy. The visual analog scale was applied on day one, day seven, and day ten, while the Neck Disability Index (NDI) was used before treatment.

Results:

The experimental group had a decrease in pain on average of 1.73 (p-value = 0.006) in VAS 2. Even in VAS 3, we have the test F = 2.837 (p-value = 0.000).

Conclusion:

These findings demonstrate substantial variations between groups, while the NDI results revealed moderate disability during daily life activities in the control (3.20±0.77) and experimental groups (3.27±0.79). Passive mobilization combined with PNF technique is an extremely effective physiotherapeutic protocol for patients suffering from CR.

Keywords: Neck pain, passive mobilization, cupping massage, isometric exercise, stretching

Effects of proprioceptive neuromuscular facilitation on components of functional physical activity in patients with Parkinson’s disease

Jung Ho Lee

journal of medical pharmaceutical and allied sciences
DOI: 10.55522/jmpas.V12I2.5079

ABSTRACT

Objective:
The purpose of this study was to investigate the effect of proprioceptive neuromuscular facilitation on the balance and gait required for functional activities in patients with Parkinson's disease.

Methods:
16 patients were randomly assigned to an experimental group receiving Proprioceptive neuromuscular facilitation (PNF) and a control group receiving functional electrical stimulation. BBS, POMA, and TUG were used before and after intervention to evaluate balance and walking ability required for functional activities of patients.

Results:
In the study results, all groups showed a significant increase in intra-group evaluation using BBS, POMA, and TUG, and in the analysis to investigate the difference in treatment effect between groups, there was a significant difference in POMA and TUG in the experimental group compared to the control group.

Conclusion:
In conclusion, the intervention method using PNF has a positive effect on the functional activity of Parkinson's patients.

Keywords: Parkinson's disease, PNF, Balance, Gait.

Functional Electrical Stimulation in Conjunction With Proprioceptive Neuromuscular Facilitation (PNF) Technique to Improve Upper Limb Function in Traumatic Brachial Plexus Injury: A Case Report

Nishigandha P Deodhe, Pooja Dhage, Pallavi Harjpal

Case Reports Cureus. 2023 Oct 2;15(10):e46386. doi: 10.7759/cureus.46386. eCollection 2023 Oct.

Abstract

Objective:

Traumatic brachial plexus injuries (TBPIs) in the adult population are primarily a result of road traffic accidents or falls on a shoulder, which mainly affects the young population. Adult TBPI is a serious incapacitating injury that affects young adults. It decreases the function of upper extremity muscles, which affects social participation and quality of life.

Physiotherapy intervention demonstrates its effectiveness in enhancing and maintaining the function of the upper extremity, eventually decreasing the participation restriction and improving quality of life.

Results:

The proprioceptive neuromuscular facilitation (PNF) technique has been selected as a useful therapeutic option to enhance upper limb function after TBPI.

Conclusion:

The preceding case report proved the effectiveness of six weeks of functional electrical stimulation in addition to the PNF technique in improving upper limb function after TBPI.

Keywords: brachial assessment tool; functional electrical stimulation; proprioceptive neuromuscular facilitation; tbpi; upper extremity; upper extremity functional index.

Comparison of Proprioceptive Neuromuscular Facilitation with other exercises on Pain and Disability in patients with Non-specific Chronic Low Back Pain: A Meta Analysis

Ranjan, Rakesh & Singh, Smriti & Sandhya, Kumari & Chauhan, Ganesh & Kumar, Amit. (2023). January 2023 Indian Journal of Physiotherapy and Occupational Therapy - An International Journal 17(1):80-87 DOI:10.37506/ijpot.v17i1.18984

Abstract

Background: Low back pain (LBP) is encountered in both developed and developing countries. It has become one of the commonest health threats. Proprioceptive Neuromuscular Facilitation (PNF) exercises are designed to enhance stimulation of proprioception in neuromuscular junction, thereby leading to greater reduction in pain and disability score along with increase in ROM and core strength. Therefore, the present study is intended to compare the role of PNF and other exercise approach.

Objectives: To compare the effect of Proprioceptive Neuromuscular Facilitation (PNF) and other exercise approaches in Non-specifc low back pain.

Methods: In this review, Pub Med, Google Scholar, Cochrane CENTRAL databases were searched for prospective studies fulflling inclusion and exclusion criteria. Randomized controlled trials comparing PNF with other treatment techniques to treat chronic non-specifc low back pain were included in this review. Data was extracted and assessed for the quality of the trials by two independent reviewers. The results were presented in form of forest plots.

Results: 11 studies were included in the review for qualitative analysis and meta-analysis. All the studieshowever, relatively little study has been undertaken examining the effects of massage on women in labour. Methods. A randomized controlled study was conducted between September 1999 and January 2000. Sixty primiparous women expected to have a normal childbirth at a regional hospital in southern Taiwan were randomly assigned to either the experimental (n=30 were included in the meta-analysis of pain and eight of the studies were included in the meta-analysis of the functional disability due to back pain. Overall, there was a small reduction in pain intensity of low back pain in patients receiving PNF treatment as compared to other treatment techniques (SMD: -1.41 [95% CI: -1.97, -0.84], I2= 82.9%; p<0.000).). There was marked improvement in functional disability in lowback patients after PNF than other treatment techniques (SMD: -1.63 [95% CI: -2.28, -0.98], I2= 80.8%; p<0.000).

Conclusion: PNF group was more benefcial than other treatment techniques in decreasing pain and functional disability scores in 4- to 6-week intervention. This meta-analysis suggests publication bias. Keywords: Low back pain, Chronic low back pain, non-specifc low back pain, treatment techniques in low back pain, PNF in low back pain

 Review of Literature on the Effect of Constraint induced Movement Therapy along with Proprioceptive Neuromuscular Facilitation in Upper Limb Fine Motor Skills in Chronic Stroke

Priya, Anshu & Thomas, Annie. (2023)
Patients. 10.21275/SR23405132152.

Abstract:

Aim: Patients with chronic strokes are most frequently impacted by upper limb dysfunction over a prolonged period of time, which further contributes to a person's deterioration of fine motor skills. This review's objective was to assess the literature and studies on the effects of CIMT and PNF on the upper limb fine motor skills of chronic stroke patients.

Methods: A thorough search using the keywords constraint-induced movement therapy, proprioceptive neuromuscular facilitation, upper limb, fine motor skills, chronic stroke, dexterity, sollerman-hand function test, box and block test, post-stroke, rehabilitation, AND, OR, IN was conducted in the databases of PubMed, PEDro, and Google Scholar. Since 2007, case-control trials, comprehensive reviews, meta-analyses, randomized control trials, and quasi-experimental studies.

Results: There were 13 studies in total. According to this review's findings, CIMT and PNF have both significantly improved the fine motor abilities in the upper limbs of chronic stroke patients.

Conclusions: the conclusion from the analysis of this review, that when PNF (Proprioceptive Neuromuscular Facilitation) is applied in combination with CIMT (Constraint Induced Movement Therapy) can exemplify the favorable impacts and results in improving the upper limb fine motor skills.

Implications: By combining CIMT and PNF and designing them in a way that enhances a person's dexterity, we can maximize the process of development for upper limb fine motor skills in chronic stroke patients.

Effectiveness of Proprioceptive Neuromuscular Facilitation in Gluteus Medius Activation for Low Back Pain among Tailors

Promotha Sriramulu , Ramana Kameswaran, Vinodhkumar Ramalingam, Kumaresan Aabathsagayam , Vignesh Srinivasan , Rajesh George Nadhar , Ling Shing Wong

Universal Journal of Public Health 11(5): 621-626, 2023 http://www.hrpub.org DOI: 10.13189/ujph.2023.110510

Abstract

Objective:

Work-related low back pain (LBP) is the most frequent musculoskeletal condition among tailors. Prolonged working in a sitting position with a poor ergonomic pattern of the trunk can elevate the risk of LBP. The gluteus medius (GM) is important for lumbar spine stability while doing work in a sitting position over a period of time.

Methods:

The study aimed to find out the efficacy of proprioceptive neuromuscular facilitation (PNF) for gluteus medius muscle with elastic tubing resistance exercises to improve gluteus medius activation for LBP among tailor populations. In total, 48 participants were involved in this study, which were divided into 2 groups, experimental group (EG) (n = 24) and control group (CG) (n = 24). EG received PNF with elastic tube resistance exercises, and the CG received PNF without elastic tube resistance exercises. Electromyography (EMG) and the numerical pain rating scale (NPRS) were taken as baseline measures in both groups before the intervention and postvalues were taken after 4 weeks of intervention in order to know the effectiveness of the intervention.

Results:

The elastic tubing resistance and PNF combined intervention exhibited a substantial improvement in the post-test, suggesting that the elastic tubing resistance would enhance GM activation.

Conclusion:

In terms of clinical efficacy, a spiral diagonal D2F movement pattern and elastic tubing with an average peak tension of roughly 90% body mass may be used to boost GM muscle activation on both stance and movement patterns at the same time to overcome low back pain among the tailor population.

Keywords Electromyography, Human Health, Low Back Pain, Resistance Training, Proprioceptive Neuromuscular Facilitation

Clinical study on the effect of proprioceptive neuromuscular facilitation technique on postoperative proprioception and neuromuscular control in patients with anterior cruciate ligament mucoid degeneration

Haijiao Wang, Hong Qian, Buqi Zhu, Youqiang Li, Xuefei Zhao, Jingmin Huang

September 2023 DOI:10.21203/rs.3.rs-3318512/v1

Objective:

To observe and compare the clinical efficacy of conventional group and PNF group in the treatment of anterior cruciate ligament (ACL) mucoid degeneration (MD) and to explore its possible mechanism.

Methods:

A retrospective case analysis method was used to analyze 34 patients (34 knees) with ACLMD diagnosed by arthroscopic surgery and pathological examination in our hospital from August 2018 to October 2020.According to the inclusion and exclusion criteria, a total of 34 cases were included, including 11 males and 23 females, aged 38-86 years, with an average age of (61.5±11.7) years, 18 cases of right knee and 16 cases of left knee. The course of disease was 3-41 months, with an average of (20.6±13.6) months. The postoperative follow-up was (15.3±1.8) months (range 12-18 months). The curative effect was evaluated before and after treatment : ① visual analogue scale (VAS), ② measurement of quadriceps atrophy, ③ Lysholm score, ④ proprioception function evaluation,⑤quadriceps mobilization ability evaluation.

Results:

Of the 34 patients enrolled, 2 were lost to follow-up, 1 was lost, and 31 completed the study. At the last follow-up, there was a statistically significant difference in VAS between the two groups at different time points ($F = 411.322$, $P < 0.01$), and there was an interaction between time and VAS ($F = 7.370$, $P < 0.01$). At different time points in the group, the degree of quadriceps atrophy in the two groups decreased gradually after treatment compared with that before treatment. However, there was no significant difference in the degree of muscle atrophy between 3 months after operation and 2 months after operation in the conventional group ($P = 0.125$, $P > 0.05$), while the difference in the PNF group was statistically significant ($P < 0.01$). There was no significant difference in the degree of muscle atrophy between the two groups at 1 month after operation ($P = 0.114$, $P > 0.05$), and the difference was gradually significant from 3 months after operation ($P < 0.01$). Comparison of different time points in the group, the Lysholm score of the two groups of patients after treatment was gradually improved compared with that before treatment, but there was no significant difference in the Lysholm score of the patients in the conventional group at 1 month after operation compared with that before operation ($P = 0.999$, $P > 0.05$), while the difference in the PNF group was statistically significant ($P = 0.021$, $P < 0.05$).

The Lysholm score of the two groups at other time points was significantly different from that before operation ($P < 0.01$). There was no significant difference in the error value of the 15° angle regeneration test of the patients in the conventional group at 1 month after operation compared with that before operation ($P = 0.150$, $P > 0.05$), while the difference in the PNF group was statistically significant ($P < 0.01$). The error values of the passive angle regeneration test of the two groups at other time points were significantly different from those before operation ($P < 0.01$). In the comparison of different time points in the group, the evaluation of quadriceps mobilization ability of the two groups after treatment was gradually improved compared with that before treatment, and the difference was statistically significant ($P < 0.05$). At the same time point between the two groups, the difference of muscle mobilization ability between the two groups was statistically significant ($P < 0.01$).

Conclusion:

Both the conventional group and the PNF group can effectively relieve the clinical symptoms of ACLMD patients, reduce their pain visual analogue scale (VAS), reduce the degree of quadriceps atrophy, improve Lysholm function score, reduce the angle error of passive angle regeneration test, restore proprioception function, increase quadriceps mobilization ability, and improve knee joint function, but the PNF group is superior to the operation group. In particular, the PNF group has more significant advantages in reducing the degree of atrophy of the quadriceps femoris, improving the Lysholm function score, reducing the angle error of the passive angle regeneration test, and restoring the proprioceptive function.

Effects of proprioceptive neuromuscular facilitation stretching in relieving pain and balancing knee loading during stepping over obstacles among older adults with knee osteoarthritis: A randomized controlled trial

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Abstract

Objective

The purpose of this study was to investigate the effects of an 8-week proprioceptive neuromuscular facilitation (PNF) stretching in relieving pain and balancing knee loading during stepping over obstacles among older people with knee osteoarthritis, and further explore the improvements in gait patterns.

Design

Thirty-two older adults (66~72 years) with KOA were recruited and randomly assigned into PNF or control groups. They received PNF stretching or health lecture series for 8 weeks. Final data analyses were conducted among 13 participants in the PNF and 14 in the control groups. At weeks 0 and 9, they were asked to step over an obstacle of 20% of their leg length. The pain scores and knee abduction moment (KAM) (primary outcomes) were analyzed by multivariate ANOVA, and the gait variables (secondary outcomes) were analyzed by two-way (group by pre-/post) ANOVAs with repeated measures.

Results

Significant interactions were detected in the pain score, first and second peaks of KAM, and crossing velocity during stepping over obstacles, and significant between-group differences of these outcomes were detected at week 9.

Conclusion

An 8-week PNF stretching could relieve pain and balance loading between knee compartments, as well as increase crossing velocity during stepping over obstacles.

Efficacy of proprioceptive neuromuscular facilitation in improving shoulder biomechanical parameters, functionality, and pain after axillary lymph node dissection for breast cancer: A randomized controlled study

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Randomized Controlled Trial

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Abstract

Purpose: Axillary lymph node dissection and radiotherapy have been associated with pain, physical symptoms, and decreased functional abilities in the upper extremity. This study aimed to evaluate the potential effects of the proprioceptive neuromuscular facilitation (PNF) technique on muscle strength, pain and functionality in this patient group in comparison with progressive resistance training (PRT).

Methods: The study was conducted with a randomized clinical trial design. Sixty-six women were included in the study and randomly divided into three groups: the PNF group (n = 22), the PRT group (n = 22), and the control group (n = 22). The participants were evaluated at the baseline and after eight weeks of treatment. Outcome measures were determined as pain (the Visual Analog Scale), upper extremity strength (isokinetic dynamometer), functionality (the Disabilities of the Arm, Shoulder and Hand questionnaire), and perception of change (the Global Rating of Change Scale).

Results: The results showed statistically significant changes in both treatment groups in terms of shoulder flexors/extensors, abductor/adductors, internal/external rotators strength/power/endurance measurement, pain, and functionality ($p < 0.05$). Concerning functionality and perception of change, the PNF group had a statistically significantly higher improvement compared to the remaining two groups ($p < 0.05$).

Conclusion: PNF is an effective technique in increasing upper extremity muscle strength, reducing pain during rest and activity, and improving functionality in patients receiving breast cancer treatment.

Keywords: Axillary lymph node dissection (ALND); Breast cancer; Muscle strength; Proprioceptive neuromuscular facilitation (PNF); Upper extremity function.