Neuromobilization and kinesiotaping as modern methods used in physiotherapy

Gałczyk M. [1*], Van Damme – Ostapowicz K. [2]

1. Cardinal Stefan Wyszyński Provincial Hospital in Lomża – The Rehabilitation Department, Łomża, Poland
2. Department of Integrated Medical Care, Medical University of Białystok, Białystok, Poland

ABSTRACT

Kinesiotaping and neuromobilization techniques are classified as physiotherapy methods in other words, these are the methods used to treat a patient with the use of movement. Both kinesiotaping and neuromobilization can be used as a separate form of therapy or may be complementary to other methods of physical therapy. It is true to say that positive effects are likely to appear after the very first therapy sessions. **Key words:** Kinesiotaping, neuromobilization, rehabilitation, physiotherapy

***Corresponding author:**
Monika Gałczyk
Sybiraków Street 16/8, 18-400 Łomża, Poland
Tel.: 604 823 320; e-mail: monikagalczyk@onet.eu

Received: 29.06.2015
Accepted: 01.10.2015
Progress in Health Sciences
Vol. 5(2) 2015 pp 165-168

INTRODUCTION

There are many forms of effective therapy in rehabilitation that are applied by fully qualified physiotherapists and are well accepted by patients. Among these are undoubtedly kinesiotaping and neuromobilization techniques. These techniques are more and more frequently used while treating a patient suffering both from acute and chronic pain. They are counted among physiotherapeutic methods or, in other words, methods used in movement therapy. Positive effects can be often observed already after the very first therapy sessions. Both kinesiotaping and neuromobilization can be treated as separate forms of therapy, but they can also be applied as an addition to other methods of physical therapy [1-3].

Neuromobilization

Neuromobilization belongs to manual therapy methods which deal with the nervous tissue and the tissues surrounding the nervous system. These techniques substantially restore the plasticity of the nervous system – the ability to move structures that surround the nerve tissue, and restore the ability of nerve tissue to tension and stretch [2,3].

Normalizing the neuromechanics is considered as the main goal of neuromobilization therapy. The locomotor dysfunction may lead to the neuromechanic disorder which leads to impaired plasticity of the nervous system and consequently the nerve cell physiology is also disrupted. Neuromechanic disorders arise due to external causes (external pressure, uncomfortable, poor posture) and internal (swelling, intervertebral disc diseases, tumors, sore muscles) [3,4].

Before introducing neuromobilization therapy any contraindications should be excluded. To such contraindications belong: acute damage of the peripheral and central nervous system, the nervous system and spine's tumors, unstable neurological symptoms, fever, congenital anomalies of the spine and peripheral joints, lack of cooperation from the patient [3,5].

Because neuromobilization is mainly based on restoring proper neuromechanics, the treatment with the use of this method should take place at the earliest possible stage of the disease when irreversible morphological changes have not occurred yet. Its main purpose is to improve neuromechanics through the mobilization of peripheral nerves, spinal nerves or nerve roots. Neuromobilization techniques are designed to restore the proper neuromechanics of peripheral nerves and the central nervous system [6].

In neuromobilization the clinical examination is mainly based on: exteroceptive and proprioceptive sensation tests, muscle reflexes testing, palpation examination of cerebellum, the study of cerebellum tension test (tension testing), testing the cerebellum mobility (mobility tests) [7,8].

Tension tests are tests that stretch the nerve or spinal cord by setting the joints running around these structures in such a way that the adaptation of the nervous system was the largest one. In contrast, the mobility tests trigger the transfer of the nervous system by setting the tested section of neural tissue at rest, moving the tissue around the nerve is by stretching the nerve proximal and distal to the injury. In the mobilization techniques, the starting position is defined by the positive tension test or a mobility positive test. The performed technique must be adapted to the current state of the patient and should never cause the pain. In the early period of treatment we usually apply two series consisting of a few seconds of impulsations at a frequency of 2-4 per second. With slowly improving functional status of the patient the treatment time series are prolonged to 20-30 seconds. But in chronic states there should be used voltage of 10-60, which usually last from 1 to several seconds. The main principle which should always be followed is that both during and after therapy the patient should not feel pain [4,5].

As for upper limb treatment we apply a tension test of the median nerve, radial nerve tension test, the tension test of the ulnar nerve [4].

Concerning lower limb one should apply tension test of sciatic and tibial nerve, the tension test of sagittal and sciatic nerve, femoral nerve tension test, the tension test of the obturator nerve [4].

The position of limbs to carry neuromobilization can be modified by e.g. adding traction, increasing or decreasing the angular positioning of the joints. The applied procedure depends on clinical symptoms [1,4]. Properly performed neuromobilization treatment can reduce pain, decrease nerve tissue oedema, restore normal neuromechanics, reduce the tension of autonomic sympathetic system [4].

Kinesiotaping

The inventor of this revolutionary method of treatment is a Japanese chiropractor Dr Kenzo Kase. The assumption of his therapy was to use such a treatment that could affect the patient, not only during a visit but also afterwards. He concluded that the excessively tightened, hardened muscles very often interfere with the biomechanics of joints. In his point of view massage can relax the muscles but do not bring long-term effects. He designed the strip of elastic cotton and a little acrylic adhesive material which were stuck to cramped muscles and thus it prolonged the effect of the treatment. Dr Kenzo Kase called the tape

Kinesio-Taping which can also be expressed as the movement therapy, because the area covered with patches was stimulated during muscular work. The flexibility of the tape makes every patient freely move around and perform activities of daily living [9,10].

Kinesiotaping system in Europe began to grow mainly in Germany, Italy and Portugal, but these applications were not fully understood by Europeans, which is why in May 2007 instructors from Europe decided to introduce a modification concerning both teaching content and the method's name. According to them the kinesiology taping method will have better implementation in the field of myofascial and muscular chains. The concept has been defined as kinesiology taping [11].

The theory of kinesiology taping uses the sensory impact of the patch on the body in order to run compensation abilities. The weight and thickness of the patch are close to skin parameters. The elongation of the patch reaches 130-140% which means the patch does not restrict motion. It does not contain latex and is waterproof. It is also hypoallergenic, it does not cause any adverse skin reaction. If it is well stuck on the skin of the patient and may last for up to 7 days. The crucial problem of a patient is the essence of kinesiology taping. Musculoskeletal dysfunctions are associated with impaired myofascial structure and soft tissue. Proper evaluation of these disorders is the basis for the application of the patch [11,12,15,16].

The patch is applied to the stretched area of the body. After returning to the starting position the tape lifts lightly the skin. Properly applied tape makes the skin folded increasing at the same time the space between the dermis and the fascia, which improves blood and lymph circulation [10,17].

Kinesiotaping is associated mainly with sports due to its high efficiency and the opportunity to continue training despite the injury, but it is also used in terms of the pain of the spine, the Achilles tendon dysfunctions as well as in the case of lymphoedema, the instability of the joints, the shoulder or knees pain, in posture corrections , in the states after sprains and dislocations of joints, to improve proprioception, as well as to reduce the risk of injury during sports activities [10,11,18].

There are six main techniques for the application of the patch, which differ concerning the degree of tapes' stretching, the stretching of the skin area to which the patch is applied. In kinesiology taping there are certain applications used: a corrective, muscular, ligamentous, lymphatic, functional, fascial [12,13,17].

The corrective method requires stretching the tape by 25-75%, depending on the severity of pain. Muscle technique which is commonly used is a technique in which the patching takes place in a set of maximum muscle stretch which is laid along the muscles. The ligamentous method uses the tape enlargement from 25 to 100% and is used in the trigger points. The aim of lymphatic technique is to improve blood and lymph circulation – this method also reduces inflammation. The patch voltage in this method is 15%. The functional method uses tape tension achieved by the maximum motion range in the joint, which helps the weakened muscle. The last fascia method is the most difficult to conduct, because we apply it to correct the fascia settings. In such a case the patch tension between 0-75% is applied here [11,14,19].

Although tapes are relatively cheap, because a five-meter roll bought at a pharmacy or medical shop costs 35-50 zł ,applying them by oneself will not bring any results. To make the method successful with the therapeutic effect one should visit the appropriately trained physiotherapist who knowing the rules and methods in different diseases is able to apply the tape properly on selected muscles [13,20-22].
This method is becoming more and more popular in some rehabilitation centers and sometimes is refunded by the National Health Fund.

CONCLUSIONS

Using neuromobilization techniques in diseases of the musculoskeletal system is effective provided that patients are properly diagnosed and pathological changes are of functional rather than structural disorder. These techniques should be used if we get a positive test results in tension and mobility

Kinesiology taping is considered as a physiotherapeutic method perfectly complementing the therapy. Each application of the tape works 24 hours a day and the patient is provided with full comfort of wearing the tape - can take a bath or a shower, enjoy sports and so on. These advantages, combined with a feeling of wellbeing, make more and more people use this form of therapy. Physiotherapists improve their qualifications in order to develop their own solutions appropriate to every patient's specific therapy in accordance with its objectives. The essence of kinesiology taping's therapeutic effects is the right way of tape application and not the tape itself.

Observing the opportunities of kinesio-taping it can be concluded that by means of this therapy certain solutions to patients' problems and disorders can be found. We can provide help even in such cases which were difficult for physiotherapy to bring positive effects e.g. among women with aches and pains in pregnancy or in people suffering from lymphoedema. However, kinesiotaping is still most popular among athletes who have been using tapes and patches for medical purposes around the world.

Finally, it is worth mentioning that none of the two methods require long work with the patient during a single therapeutic session. This is positively viewed mostly by the patients that most frequently see the physiotherapist due to pain. It should be remembered that both the neuromobilization method and kinesiotaping are considered to be one of the components of treatment and better results are obtained after using them as methods of supportive treatment not as a monotherapy.

Conflicts of interests

The authors declare no conflict of interest in this work.

REFERENCES

1. Talebi GA, Taghipour-Darzi M, Noronzi-Fashkhami A. Treatment of chronic radiculopathy of the first sacral nerve root using neuromobilization techniques. A case study. J Back Musculoskelet Rehabil. 2010;23(3):151-9.
2. Zembaty A. Kinezyterapia. Kraków: Wydawnictwo Kasper: 2002. Chapter in a book- 3, Metody kinezyterapeutyczne; p. 222-9. (Polish)
3. Dwornik M, Białoszewski D, Korabiewska I, Wroński Z. Zasady stosowania neuromobilizacji w schorzeniach narządu ruchu. Ortop Traumatol Rehabil. 2007;9(2):111-21. (Polish)
4. Szprynger J, Sozańska G. Neuromechanika i neuromobilizacje w fizjoterapii. Lublin, Wydawnictwo Czelej: 2002. Chapter in a book-5, Badanir upośledzenia neuromechaniki; p. 32-55. (Polish)
5. Dobrogowski J, Wordliczek J. Warszawa: red. Medycyna bólu. Warszawa, PZWL: 2004 p. 38-48. (Polish)
6. Butler D. The sensitive nervous system. Adelaide: Niogroup Publications 2000 p. 211-56.
7. Butler D. Mobilisation of the nervous system. New York: Churchill Livingstone: 1991 p.107-25.
8. Butler D. The sensitive nervous system. Adelaide Niogroup Publications 2000. p. 211-56.
9. Wojtasik P. Neuromobilizacje wybranych nerwów obwodowych. Rehabil Prakt. 2011;(5): 21-6. (Polish)
10. Mikołajewska E. Kinesiotaping – Rozwiązania wybranych problemów funkcjonalnych. Warszwa, PZWL 2011. Chapter in a book- 1, Historia kinesiotapingu; p.13-15. Chapter in a book-3, Praktyczne podstawy metody kinesiotapingu: p.17-37. (Polish)
11. Tiffert M. Kinesiology taping – teoria, metodyka, przykładowe aplikacje w konkretnych dysfunkcjach. Prakt Fizjoter Rehabil. 2010;2:48-53. (Polish)
12. Śliwiński Z, Senderek T. Kinezjotaping – nowa metoda leczenia? Rehabil Prakt. 2007;3:18-20. (Polish)
13. Hałas I. Kinesiology Taping. Metoda wspomagająca terapię tkanek miękkich. Prakt Fizjoter Rehabil. 2010;9/10:22-5. (Polish)
14. Senderek T, Breitenbach S, Hałas I. Kinesiotaping nowe możliwości fizjoterapii kobiet w czasie ciąży. Fizjoter Pol. 2005;5(2): 266-71. (Polish)
15. Storch-Uczciwek A, Zielińska M, Hałas I. Zastosowanie Kinesiology Tapingu w redukcji krwiaków po zabiegach kardiochirurgicznych. Prak Fizjoter Rehabil. 2011;2/11:50-8. (Polish)
16. Senderek T, Śliwiński Z. Kinesiotaping-nowa metoda leczenia. Rehabilitacja w praktyce. 2007;3:18-20. (Polish)
17. Kuligowska-Jakubowska M, Neubauer- Geryk J, Bieniaszewski L. Leczenie przeciw-zakrzepowe u pacjentów po zabiegach kardiochirurgicznych. Choroby serca i naczyń. 2010;7(1):14-22. (Polish)
18. Morris D, Jones D, Ryan H, Ryan CG. The clinical effects of Kinesio Tex taping. A systematic review. Physiother Theory Pract. 2013 May;29(4):259-70.
19. Aguilar MB, Abian-Vicen J, Halstead J, Gijon-Nogueron G. Effectiveness of neuromuscular taping on pronated foot posture and walking plantar pressures in amateur runners. J Sci Med Sport. 2015 Apr.24.
20. Wilson B, Bialocerkowski A. The effects of Kinesiotape applied to the lateral aspect of the ankle; Relevance to ankle sprains – A systematic review. PLoS One. 2015 Jun 23;10 (6):e0124214.
21. Nawrot R, Witkoń J, Gaździk T. Kinsio Taping value In treatment of spine pain syndroms. J Orthop Trauma Surg. 2012;(3):50-63.
22. Kujawa J, Dwornik M, Pasternak K. Neuromobilizacje. Terapia chorych z zespołami bólowymi części lędźwiowo-krzyżowej kręgosłupa. Rehabil Prakt. 2009;(1):28-9. (Polish)