Effects of Kinesio-Tape on Upper Cross Syndrome

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Purpose - The purpose of this study was to use KinesioTape to alleviate the symptoms associated with Upper Cross Syndrome and the effects it has on Thoracic Outlet Syndrome. Upper Cross Syndrome characterized by facilitation of the upper trapezius, levator scapula, sternocleidomastoid, and pectoralis muscles, along with inhibition of the deep cervical flexors, lower trapezius, and serratus anterior.

Methods - The use of KinesioTape has been proven and is taught in a certifiable course to treat many different, yet common neuromusculoskeletal conditions such as Upper Cross Syndrome and Thoracic Outlet Syndrome. The use of the adhesive tape and the specialized methods in which it is applied has shown to either inhibit or facilitate certain muscles to which the tape is applied. The tape also has been proven to help alleviate pain, inflammation, increase pain free ROM and aid in the drainage of excess lymph as a result of either a traumatic event, overuse syndromes, or injuries. Our study was comprised of two groups; a control and an experimental. Half of the participants were randomly placed in a control group; these subjects were taped, but when applying the tape correct procedure (non-therapeutic) were not applied. The other half of the participants was in the experimental group and received the correct (therapeutic) taping procedure. The only exclusion criteria for receiving any taping would be a participant being competent in KinesioTaping and knowing if they received therapeutic taping simply by having the tape applied to them by the investigators.

Results - The results showed an increase in average grip strength for both the right (+4.8 lbs) and left (+1.5 lbs) hands for the experimental group. However, the muscle testing did not show any instance of an improvement of strength from weak to strong. The control group also showed an average improvement of the left hand grip strength (+3.4 lbs). However, the average right hand grip strength for the control group decreased (-2.9 lbs). Unlike the experimental group, the control group did show 3 of the 7 participants become stronger in each muscle group category.

Conclusion - The results of this study do not definitively demonstrate whether Kinesiotape is effective for the treatment of Upper Cross Syndrome.

Key Words: Kinesiotape, Upper Cross Syndrome, Thoracic Outlet Syndrome, Neuromusculoskeletal Conditions.
Introduction

The purpose of Kinesio-Tape is to aid in the healing of many athletic and postural injuries to the human musculoskeletal system. The tape works by either facilitating or inhibiting a certain muscle or muscle groups in order to achieve the desired result. In this order of research, the desired result was to properly use the Kinesio-Tape to help correct Upper Cross Syndrome in students at Logan College of Chiropractic. The use of the tape would be to inhibit the hypertonic muscles and facilitate the muscles that were being neglected due to the Upper Cross Syndrome aka student posture.

Materials and Methods

This study required the use of a multitude of instruments and measuring devices. The initial exam required the use of a posture analysis photo set-up, dynamometer and muscle testing. The second and third visits involved the application of the Kinesio-Tape. The fourth and final visit, very similar to the first visit, minus the informed consent, required us to use the posture analysis photo set-up, dynamometer and muscle testing for comparative means. Our participant panel consisted of current Logan student/faculty with evidence of Upper Cross Syndrome (UCS). The determination of UCS was decided by determining if the participant has abnormal posture and hypertonic/hypotonic muscles that correlate with this syndrome. Posture was evaluated by using a vertical plumb line that will hang from the ceiling. Subjects were asked to stand next to the line so that the line is hanging next to their right arm. Researchers did a posture assessment of the subject by taking a lateral image of them while standing. The image was taken with a digital posture picture in the research department at Logan
College of Chiropractic. Normal posture with a plumb line goes through the patients’ external auditory meatus, acromion process on the shoulder, greater trochanter on the hip, posterior to the patella & anterior to the lateral malleolus. Any subject between the ages of 19-70 that show an abnormality from this description will be a candidate for this research. Subject must be naive to the kinesiotaping procedure.

The study focused on the application of KinesioTape to the neck, chest and shoulder region of our subjects. All subjects were given the option to be gowned. The participants came in twice a week for one week. Since KinesioTape stays on for approximately 3-5 days, we’ve decided to see the subjects every 72 hours to reapply the KTape. After one week of wearing the KTape, the subjects went one week without wearing tape. During the third week, a reevaluation of grip strength and nerve test was done to determine if the KinesioTape had any permanent benefit/effect.

During the first visit, the subjects signed a consent form, complete Appendix A (exclusion criteria), and be screened for Upper Cross Syndrome (UCS). If the subject meets the study requirements, they were then randomly placed into either the control or experimental group. Researchers performed an evaluation of grip strength using a dynamometer and testing of the Median, Ulnar, and Radial nerve in each subject by doing a simple finger flexing (muscle strength) test. One of the researchers performed the evaluation of posture & did the muscle palpation and testing on each of the subjects, this researcher was “blinded” from the two separate groups of subjects. The researcher that was “blinded” from the groups means he/she did not know whether the subject is in the control (non-therapeutic) or experimental (therapeutic) group. The subject was asked to oppose their 1st and 5th digits and attempt to hold them together while the
“blinded” researcher attempts to pull the fingers apart. The subjects’ wrist will be placed in anatomical position (supination), full pronation, and mid supination/pronation. Once testing was complete, KinesioTape was applied to the shoulder, pectoral, and mid back region. If the subject is in the experimental group, they will have received the correct (therapeutic) taping procedure. If they were in the control group, they will have received the incorrect (non-therapeutic) taping procedure. Tape will be applied at the end of each visit.

The second visit (72 hours after the first), subjects will have grip strength and muscle testing evaluated. The old tape was removed and new tape applied. Any adverse reactions to the tape or any part of the study protocol will be noted and addressed carefully on a case by case basis.

The third visit (96 hours after the second), assessment of grip strength, muscle testing of 1st and 5th digits, and the KinesioTape was completely removed.

The fourth visit (72 hours after the third), a reevaluation of the subjects’ posture via the posture picture was done.

The experimental group received the correct (therapeutic) application of KinesioTape. The tape was applied with a specific tension so that it can act on the targeted musculature. On the other hand, the control group received the incorrect (non-therapeutic) application. This taping procedure was applied with no tension and will have no effect on the musculature. We decided to use one color (black) on all subjects so that there are no discrepancies between individuals believing that the different colors of tape produce a different therapeutic effect.
Results

After the conclusion of compiling all of the data from each participant, it was necessary to graph the results of the therapeutic group vs. the non-therapeutic group. There were 13 participants in the experimental group who returned for every visit to be used for data; likewise there were 7 participants who returned for every visit for the control group. This chart shows the changes seen in grip strength from pretreatment to post treatment. The average grip strength for

Figure 1.-Graph representing the average grip strengths as tested each time by the same identical dynamometer.

*(Control group did not receive actual treatment)*

the left and right hand of the experimental group pretreatment was 100.2 pounds and 104.8, respectively. These values improved to 101.7 (left) and 109.6 (right) after therapeutical treatment, respectively. The values for the control group before tape was applied was 82.9 and 92.3 for the left and right hands, respectively. After the non therapeutical taping was applied the left hand increased to 85.6, while the right hand decreased to 89.4.

The muscle testing for the experimental group showed no instance of a muscle improving from weak to strong in any of the muscles tested. However, there were a number of experimental group participants who changed from strong to weak. These results are as follows: the shoulder (5 of 13), the elbow (4 of 13), the wrist (6 of 13), and the paper
The muscle testing for the control group showed many instances of a muscle group improving from weak to strong. The results are as follows: the shoulder (3 of 7), the elbow (3 of 7), the wrist (3 of 7), and the paper test (3 of 7). The control group also showed one instance of a participant’s wrist strength changing from strong to weak. The remaining participants of each muscle group did not show any change after treatment.
Figure 2

Figure 2.- An example of the posture screening process, pre and post treatment. This was part of the inclusion criteria that had to be met in order for one to participate in the research study. In this figure, the white dot placed on the right ear of the subject is anterior to the dot on the right shoulder, indicating possible “Upper Cross Syndrome symptoms.”

Discussion

The results of the study are varied. While the grip values for the experimental group improved on average for the right and left hand, the muscle testing showed no instance of improvement. In fact, there are many cases of the participant actually
becoming weaker. On the other hand, the control groups showed a decrease of grip strength for the right hand, but and improvement of the left hand. However, the control group only shows one instance of a muscle group becoming weaker, while 3 of the 7 participants actually showed improvement with each muscle group.

There are several limitations to the study. Of the 26 participants who began treatment, only 20 followed through the entire study. Five of these participants were in the experimental group, which may have shown improvement had they followed through with the study.

Another limitation of the study, and perhaps greatest limitation, was the tape itself. While kinesiotape was designed to effectively last 3-5 days on a patient, many participants stated that the tape began peeling off within a mere 24 hours of application. Closer inspection of the kinesiotape used by the examiners revealed that the tape did indeed not seem to be adhering as it should based on their experience with using the tape in the past. Because participants were only seen twice a week, this severely limited treatment time and effectiveness of these participants.

Yet another limitation of the study is the subjectiveness of the muscle testing. While the examiners did use only one examiner who was blinded for all the testing, the testing was still based on the examiner’s expertise and opinion. It would have been more beneficial to find another way to find a true measurement for these tests.

**Conclusion**

In conclusion, based on the results from this study, it is unclear whether kinesiotape has a lasting effect on Upper Cross Syndrome. A repeat study with new
tape, more participants, and more assessments that have measurable values would further help to demonstrate the efficacy of this treatment.

References

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