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Acute effect of massage on grip performance

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Massage has been used for thousands of years. In recent decades massage has became more popular among therapists and athletes. Gradually, Researchers and massage therapists elicited new concepts and techniques from old massage methods or began to use the old techniques in more scientific ways. Researchers involving in the field of massage provided some evidence for positive effects of massage. Therefore it could be said that massage is no longer considered only as a relaxation method. Today, massage is widely used in rehabilitation and has been shown to be helpful in reducing pain and joint stiffness, also it can boost immunity. However, little evidence exists about the effectiveness of massage on performance. Generally, there are three different viewpoints about the effectiveness of massage on performance. According to one opinion, massage has no effect on performance i.e. massage neither improves nor prevents muscle performance. According to another opinion, massage produces adverse effects on performance i.e. following the application of massage, muscle performance decreases.

The third opinion states that massage improves muscle performance. However, our study about the "acute effect of massage on grip performance" showed that massage was effective in immediate improvement of grip performance. Maybe there would be a question why opinions about the effect of massage on performance are so controversial. It seems that factors such as characteristics of participants, duration of massage, and target muscles are contributed in this controversy. Participants characteristics like being athletic or non athletic, female or male, healthy or patient, young or elderly can change the outcome of massage. Preparation of participants is also important. For example whether or not subjects were asked to do mild exercise or warm up before receiving the massage.

In addition, duration of massage may influence the effect of massage. For example, short or long massage duration, one massage session, every day or every other day massage sessions may affect the massage response. Likewise, target muscles are important. It is not unlikely if we expect to notice different responses following the application of massage in large muscles and small muscles, or in phasic (mainly fast fibers) and tonic muscles (mainly slow fibers). Another factor which influences the effect of massage on performance is the experience of person who performs the massage, whether he/she is novice or professional. In our study (1), forty four healthy university students (age 21.5±1.9 years, weight 72.9± 6.1kg, height 72.5±6cm) were assessed for grip performance. Subjects were randomly assigned to massage or passive movement (control) group. However, we tried to match the participants in both groups as much as possible. Before the intervention, both groups -massage and passive movement (control) groups- were matched for the factors that would affect the grip performance in order to have more identical groups.

Therefore in addition to routine variables such as age, weight, and gender some other aspects such as belonging to university population or being right handed was considered. Since it has been reported that right handed or left handed may influence grip performance, only right handed subjects participated in the study in order to increase consistency between groups. Besides, all the subjects were tested at the same time of day to minimize the possible interference of circadian rhythm. Of course there were no significant differences for hand grip strength and hand grip endurance between the two groups before the intervention. Massage was applied to Group 1 and passive movement was performed for Group 2 (control group). Hand grip endurance

and hand grip strength were evaluated prior to intervention and immediately after. A significant increase of hand grip endurance appeared immediately in the massage group (P<0.001). Hand grip strength showed a trend to increase in the massage group, however, this enhancement was not significant (P= .077). Also, post intervention comparison between both groups revealed a statistically significant difference for endurance (P<0.0005).

Subjects in the passive movement group (control group) did not show any improvement either in hand grip strength or endurance (P>0.05). Based on these findings, we concluded that one session of massage to the forearm immediately improved the grip endurance in the young men. Our study (1) demonstrates the feasibility and importance of forearm massage in improving grip performance. The study has several advantages and some limitations:

A. It investigated the effect of massage on performance. Many researchers, physical therapists, and athletics are interested in knowing if it would be possible to improve performance by massage.

B. In addition, the article is about the grip which is very important in daily activities (such as carrying a suitcase or turning a doorknob) and sports (like tennis, basketball, and mountain climbing). Also, many jobs are greatly dependent on grip strength. The article studied the function of grip from two perspectives. Grip strength and grip endurance. Grip strength is a general term used to describe the amount of power a person can generate with his or her hands. Maximum grip strength is rarely used in daily activities. In most activities repeated dynamic grip is required rather than a single powerful short grip. Muscular endurance is the ability of a muscle or group of muscles to sustain an isometric contraction or continue repeated contractions against a resistance for an extended period of time. Therefore grip endurance is a kind of repeated or sustained grip. In activities like carrying a suitcase which requires prolonged static holding rather than exerting maximum force during a single repetition, grip endurance is involved. There is neither direct relationship nor inverse relationship between grip strength and grip endurance. On the other hand, an individual with low grip strength may show good grip endurance or an individual with high grip strength may present weak grip endurance.

C. In this study massage was applied for the healthy young men and athletics were excluded from the study because athletics are usually in good body condition and their muscles function is almost at its peak. It seems to us that it would be difficult to enhance muscle function when it is already is in its peak.

D. The subjects were given three minutes for rest and active recovery. Active recovery refers to recovering from an exercise using a low-intensity activity. It has been suggested that active recovery clears accumulated blood lactate faster than passive recovery. The general theory is that low-intensity activity assists blood circulation which, in turn, helps remove lactic acid from the muscle. Following active recovery interval, participants received either 5 minutes massage or passive movement and then post intervention measurement was performed and indicated that immediately after the massage, improvement in grip endurance was more noticeable than improvement in grip strength. On the other hand, the study showed that massage was more effective in improving sub maximal sustained muscle contractions (endurance) than in maximum muscle contractions (strength).

E. In the present study, massage was not used for large muscles; rather, it was applied to the forearm and hand muscles. Therefore we ensured that effective contact for small muscle groups in the upper limb was provided. However, providing adequate contacts for large muscle groups (such as hip muscles) is rather difficult.

F. Since both intrinsic hand muscles and extrinsic forearm muscles are involved in grip performance, massage was applied not only for extrinsic forearm muscles, but also it was applied to intrinsic hand muscles.

G. We tried to diminish the effects of factors which may affect the grip performance. Factors such as age, sex, weight, height, muscle fatigue, neuromuscular disease, musculoskeletal dysfunctions, anxiety, temperature, warm-up, and physical activity. All the participants were young and healthy; BMI was between 22 and 25 kg/m2; all the participants were nonathletic; and during the test, the participants were comfortable and relaxed. They had no anxiety and were encouraged verbally to put in maximum effort. They had no neuromuscular or musculoskeletal dysfunction, and they warmed up for five minutes before the test. However, the study has some limitations.

a) The same therapist performed massage and measurement which probably increased the bias.

b) The study investigated only immediate effects of massage on grip performance. It is suggested that future studies examine the long-term effects of massage on grip performance.

Despite this experience (improving grip performance following massage), in my opinion, massage does not always improve performance. When we talk about the effect of massage on performance or muscle function, many factors should be considered. For example, if the target muscle is large and the massage protocol is not able to cover the muscle properly, or if the participants were not properly prepared, or if relaxing massage techniques are used instead of facilitating massage techniques, one cannot except to see positive effects of massage on performance. In order to facilitate muscle function, rapid stroking and kneading were applied over the ventral and dorsal surfaces of the forearm and hand for five minutes.

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