

Effects of Static and Dynamic Stretching on Muscular Function, Temperature and Muscle Fiber Conduction Velocity

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INTRODUCTION

Warm-up, a pre-preparatory activity of exercise, is one of the essential elements of exercise routine widely applied to improve the biological function of the human body, and one of the most representative warm-ups is known as stretching. It can be divided into static and dynamic stretching, and a prior study suggests that there exist various short-term effects of the stretching depending on the stretching method. The purpose of the study is to investigate the differences between static stretching (SS) and dynamic stretching (DS) that affect the muscle function during exercise. In this regard, we analyzed Muscle Temperature (T_m), muscle fiber conduction velocity (MFCV) and muscle joint functions pre and post the two stretching methodologies.

METHODS

Eight male college students were recruited for this study, and experienced SS and DS to find out the biological differences between the two warm-up routines.

RESULTS

As a result, the range of motion (ROM) of the knee and hip joint showed a significant increase after SS and DS (SS pre vs. post, $p < .05$ and DS pre vs. post, $p < .01$). The data for vertical jump (VJ) showed significant interaction effect between time and treatment and significant difference between pre and post (SS pre vs. post, $p < .05$ and DS pre vs. post, $p < .01$), and DS showed higher VJ height than SS ($p < .01$). The data for Side Step had no interaction effect, but significant increases were observed after SS and DS (SS pre vs. post, $p < .01$ and DS pre vs. post, $p < .01$).

T_m data also had no interaction effect but showed a significant increase after SS and DS (SS pre vs. post, $p < .05$ and DS pre vs. post, $p < .05$). The interaction effect of MFCV was not found, but there was a statistically significant increases after DS trial ($p < .05$), and DS increased MFCV more effectively than SS ($p < .05$).

CONCLUSION

The SS applied in this study did not lead to negative effects in terms of muscle function, but based on MFCV data response, DS is considered to be a more efficient warm-up routine than SS. Therefore, DS seems to be a more effective way to prepare for active muscle contraction as a means of warm-up routine.