The Reporting of a Multifaceted Mixed Martial Arts Strength and Conditioning Program

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ABSTRACT

Peacock CA, Sanders GJ, Antonio J, Silver TA. The Reporting of a Multifaceted Mixed Martial Arts Strength and Conditioning Program. JEPonline 2018;21(1):86-90. With the recent increase in popularity of Mixed Martial Arts (MMA), it is imperative to assess the effectiveness of strength and conditioning (S&C) modalities while encouraging other S&C professionals to do so as well. There is minimal literature evaluating the role of S&C, and even less literature evaluating the role of the traditional mixed martial art, Tai Chi (TC) as it applies to MMA. Twelve professional MMA athletes were tested on balance, flexibility, and power following a 6-wk S&C program that included TC in the form of a cool-down. The data suggested improvements (P≤0.05) in both balance (Balance Error Scoring System, BESS) and flexibility (sit and reach) following the 6-wk block of MMA S&C in adjunct with TC.

Key Words: Balance, Exercise, Flexibility, MMA
INTRODUCTION

Recent Tai Chi (TC) literature has emphasized improvements in balance, gait, and flexibility in both special and healthy populations when compared to other active therapies (8,9). When compared to other exercising modalities, TC is also linked to improvements in muscular strength, primarily in the knee and ankle movers (1). Many of these improvements in strength and flexibility have been theorized as improved neural activation activity and homeostasis (8). Other research has indicated that TC can increase neural control in the body’s extremities, including the lower body (10). In addition, TC results in certain physical benefits by way of improving cardiorespiratory health (2,3). Finally, TC has been shown to produce benefits in hormone performance levels such as cortisol (5).

With all of the evidence linking TC to improved physical performance, there is still a lack of research examining the inclusion of TC into Mixed Martial Arts (MMA) strength and conditioning (S&C). Therefore, the purpose of this study was to assess the effectiveness of the inclusion of TC as a cool-down modality for MMA S&C sessions. We hypothesize that TC in adjunct to proper S&C may elicit physical performance improvements in professional MMA athletes.

METHODS

Subjects
Twelve professional MMA athletes (12 males, 25.2 ± 2.3 yrs.; 177.3 ± 8.6 cm; 85.6 ± 17.3 kg) completed a 6-wk block of S&C training. In adjunct with the S&C training, TC was used as a cool-down. The Nova Southeastern University IRB approved the program assessment investigation. The S&C training period was comprised of multiple components, including anaerobic, metabolic, and TC methods (Table 1).

Table 1. Six-Weeks of S&C in Adjunct with TC Program.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Frequency</th>
<th>Duration</th>
<th>Intensity</th>
</tr>
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<tbody>
<tr>
<td>Anaerobic Resistance and Mobility Training</td>
<td>2 d·wk⁻¹</td>
<td>30 min</td>
<td>67 – 85% 1-RM</td>
</tr>
<tr>
<td>Metabolic Conditioning</td>
<td>2 d·wk⁻¹</td>
<td>10 min</td>
<td>&gt; 9 Mets</td>
</tr>
<tr>
<td>Tai Chi</td>
<td>2 d·wk⁻¹</td>
<td>10 min</td>
<td>Cool-Down</td>
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**METS** = Metabolic Equivalents; **1-RM** = One-Repetition Max
Procedures
The first of these components included anaerobic resistance and mobility training exercises. This component included Movement Preparation, Upper-Body Push and Pull, Lower-Body Push and Pull, Carry Variation, and Rotational Exercises. The metabolic conditioning exercise was the second component of the training. It consisted of multiple modalities to elicit a vigorous exercise response (i.e., >9 METs [metabolic equivalents]), which included airdyne, sprint, and battle-robe training. The third component, in conjunction with the anaerobic and metabolic exercise, was the inclusion of TC as a cool-down. The TC included multiple movements focusing on both the half body-turning movements and upper quarter body movements as they are theorized to mobilize internal energy efficiently (4).

Statistical Analyses
The programmed components of the training were utilized in all training sessions over the 6-wk period (12 S&C training periods total). The athletes were tested for balance (Bess Testing), flexibility (Sit and Reach), and power (Vertical Jump) both pre and post 6-wk training period. All data were analyzed using a two time-point (pre, post) repeated measures ANOVA. Post hoc analyses of any significant main effects of condition were performed utilizing t-tests with the Benjamini and Hochberg False Discovery Rate correction for multiple comparisons. Means and variability were calculated for all variables. All statistical analyses were completed using SPSS for Windows (version 22.0, SPSS Inc., Evanston, IL).

RESULTS
The data analysis confirmed that the 12-subject population of professional MMA athletes improved both their balance (Balance Error Scoring System, BESS) and flexibility (sit and reach) during the 6-wk block of S&C in adjunct with TC (Table 2).

Table 2. Pre- and Post-Assessment of Testing Measures in MMA Athletes (Mean ± SD).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-</th>
<th>Post-</th>
<th>P-value</th>
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<tbody>
<tr>
<td>BESS</td>
<td>11.9 ± 3.1</td>
<td>10.8 ± 2.8</td>
<td>P = 0.012*</td>
</tr>
<tr>
<td>Vertical Jump (cm)</td>
<td>68.9 ± 4.8</td>
<td>68.4 ± 5.2</td>
<td>P = 0.392</td>
</tr>
<tr>
<td>Sit and Reach (cm)</td>
<td>17.4 ± 4.2</td>
<td>18.8 ± 4.3</td>
<td>P = 0.004*</td>
</tr>
</tbody>
</table>

SD = Standard Deviation; cm = Centimeters; *denotes significance (P≤0.05).

Overall, the subjects significantly (P≤0.05) improved their balance (using the BESS test) by 9% and flexibility (using the Sit and Reach) test by 8%. There were no significant (P≥0.050) improvements in the subjects’ power Vertical Jump test following the 6-wk training block.
DISCUSSION

As MMA increases in popularity, so will the potential for improved practices and strategies in S&C preparation. The aforementioned training block provided professional MMA athletes physical improvements following TC in adjunct with MMA S&C training over a 6-wk period. Comparable to recent TC literature, the data demonstrated improvements in both balance and flexibility in the MMA population (6-9). In addition, the data demonstrated similar results in the existing literature, given the “no improvement” in the subjects’ power testing (7).

Although TC has been widely researched, there is minimal literature regarding the effectiveness of TC in adjunct with S&C in professional athletes, including MMA. The reported significant evidence in regards to balance and flexibility improvements may better contribute to the existing literature targeting athletic populations. Although this is a preliminary brief report examining the performance results, it is not without limitations. In particular, given that it is difficult to obtain professional MMA athletes, the sample size is relatively small. Secondly, no “control” exists for the comparison of results between groups. Currently, research is underway to reflect limitations and to better examine S&C data in professional MMA athletes.

CONCLUSIONS

The MMA athletes may benefit from the inclusion of TC training with their S&C training. The results in the present study demonstrate that TC in adjunct with traditional S&C programming improves both flexibility and balance. These results may also prove beneficial for athletes interested in the improvement of multiple aspects of performance while training for MMA.

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REFERENCES


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