

The Effect of Ankle Braces on EMG and Vertical Jump During a Volleyball Approach Jump

Caitlin Sander, Brent Alumbaugh, and Gannon White
 Department of Kinesiology, Colorado Mesa University
 Grand Junction, Colorado

INTRODUCTION

Ankle injuries in jumping sports are a major concern for athletes, so as a prophylactic measure, many wear ankle braces. However, there is a concern for a decreased athletic performance when wearing ankle braces. The purpose of this study was to determine whether there is a difference in surface electromyography (EMG) during the landing phase of a volleyball approach jump in addition to if vertical jump is affected with and without the T2 active ankle brace in division II volleyball players.

METHODS

Muscle activation was assessed using surface EMG for the tibialis anterior, soleus, lateral gastrocnemius, and medial gastrocnemius between two conditions: no ankle brace and the T2 active ankle brace. Order of conditions was randomized for each subject via coin flip. The subjects completed maximum vertical jumps in both conditions and EMG data were normalized using maximum voluntary contraction (MVC) for each muscle.



Figure 1: T2 Active Ankle brace.

RESULTS

Ankle braces did not have significant differences on surface EMG in the soleus, lateral gastrocnemius, and medial gastrocnemius ($P > 0.05$), but did have a significant increase in activation for the tibialis anterior ($P = 0.016$) when compared to no ankle brace. No significant differences were observed in vertical jump height between the conditions.

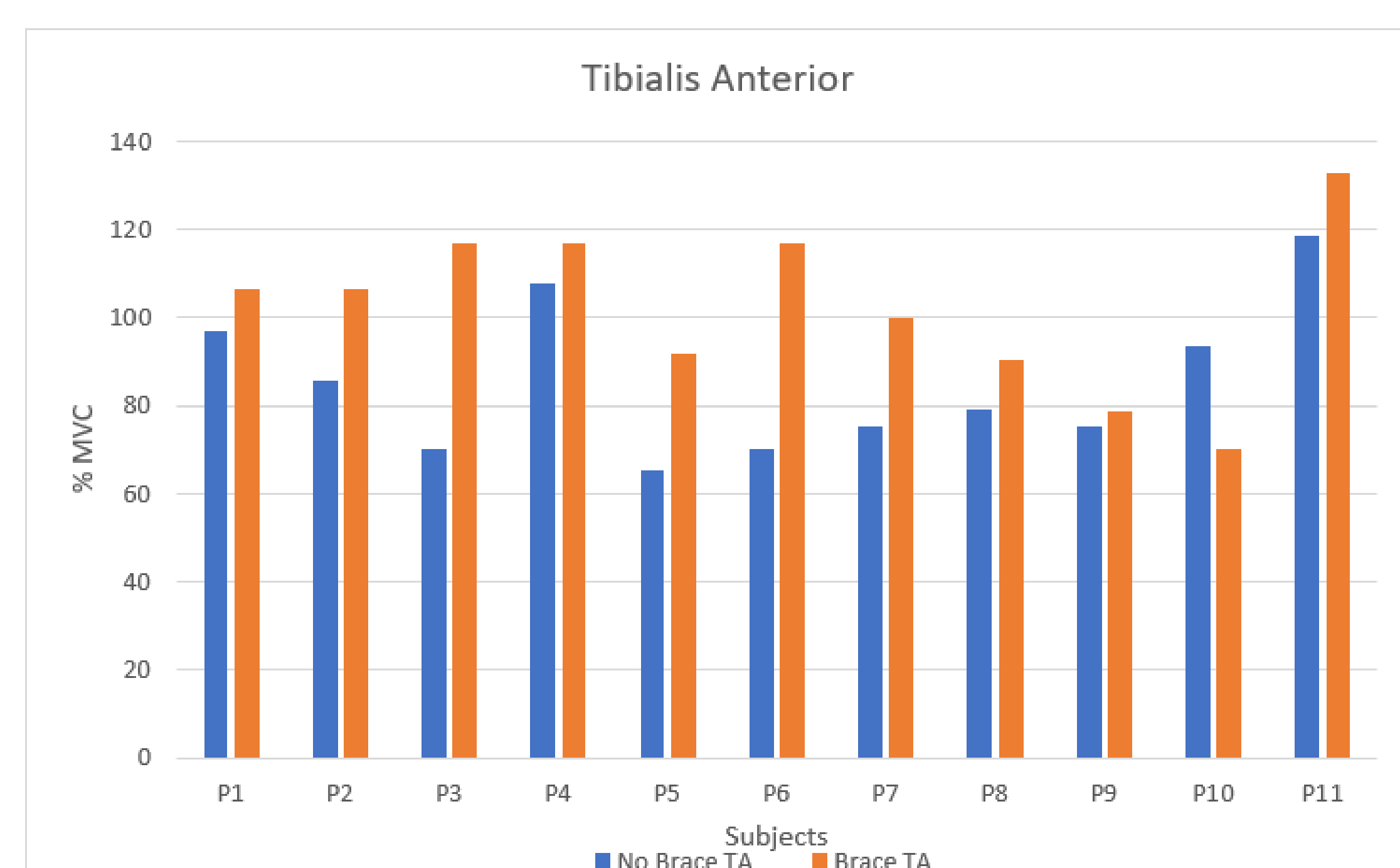


Figure 2: EMG results for both conditions for each player reported in % MVC

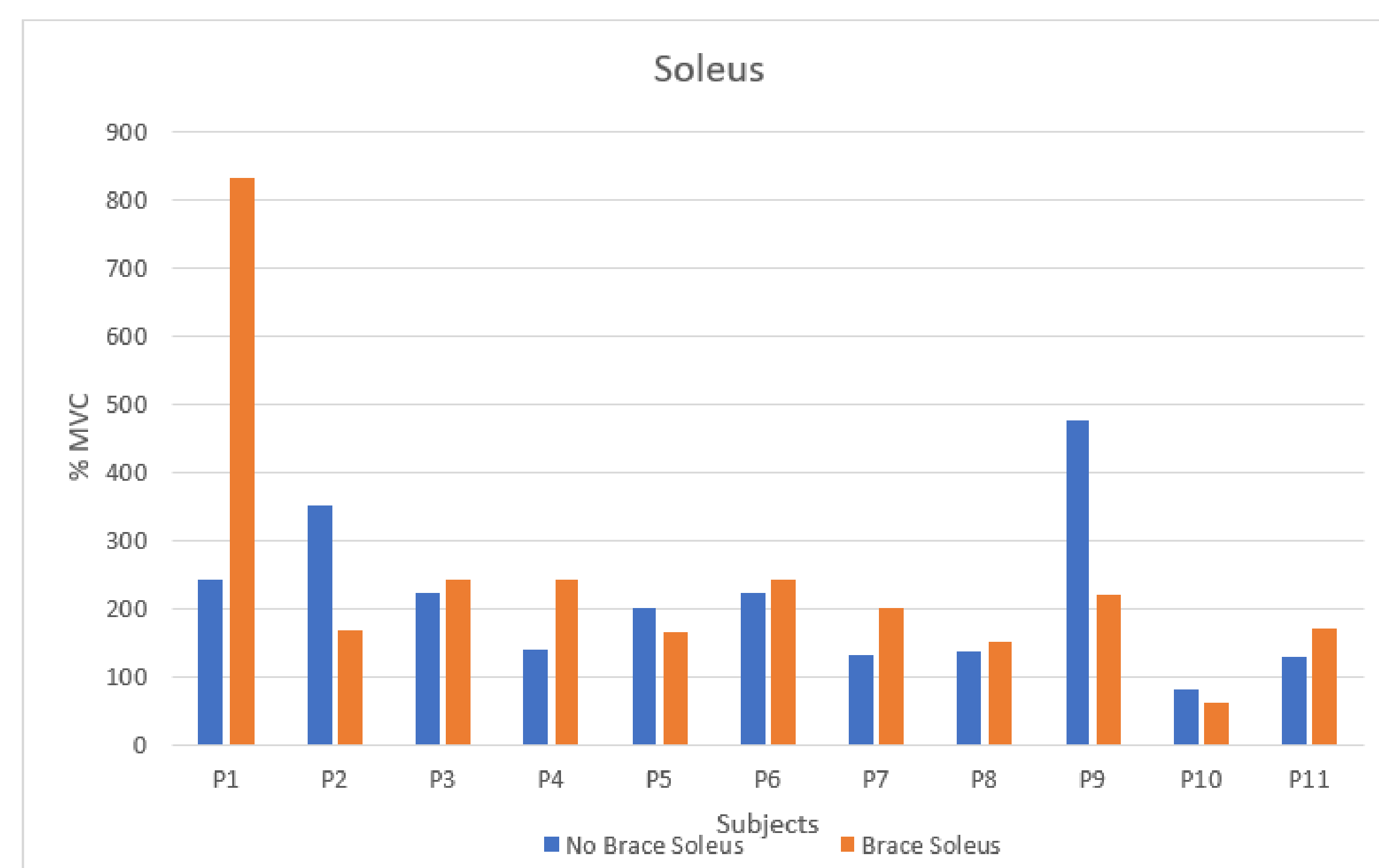
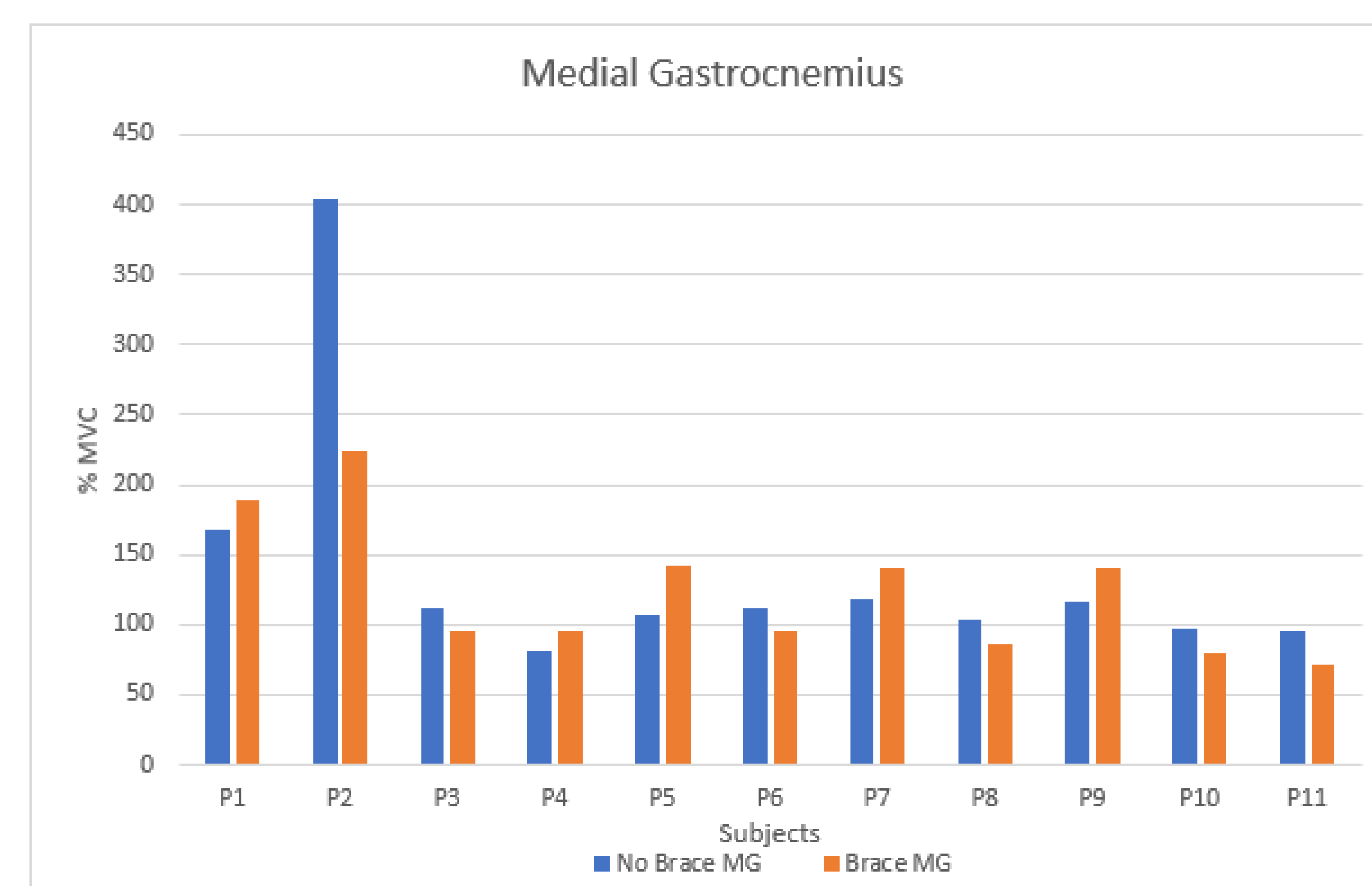
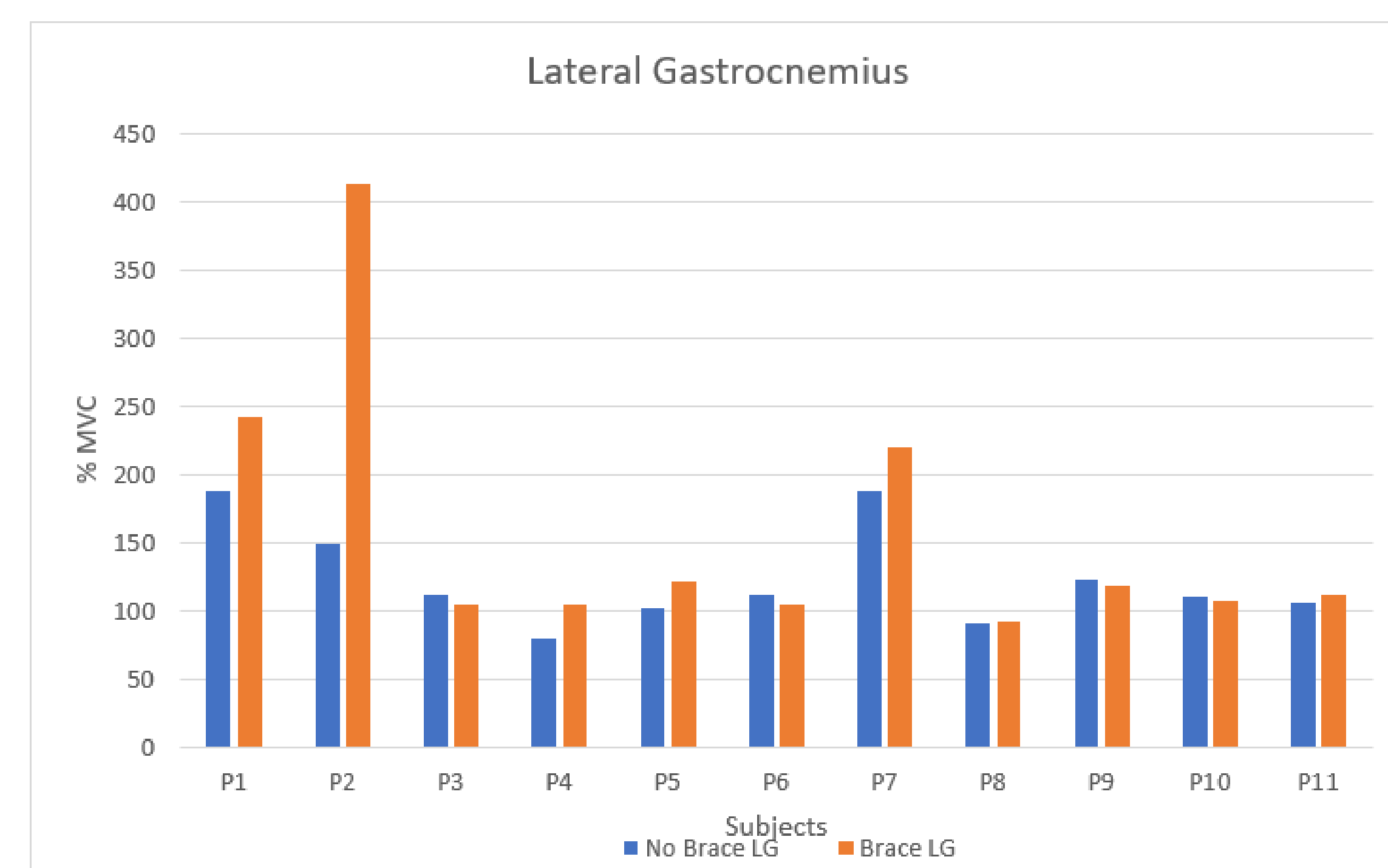


Figure 2 cont: EMG results for both conditions for each player reported in % MVC



DISCUSSION

Ankle braces did not have significant differences on surface EMG in the soleus, lateral gastrocnemius, and medial gastrocnemius ($P > 0.05$), but did have a significant increase in activation for the tibialis anterior ($P = 0.016$) when compared to no ankle brace. No significant differences were observed in vertical jump height between the conditions.

CONCLUSIONS

The T2 active ankle brace did not significantly alter the surface EMG of the soleus, lateral gastrocnemius, and medial gastrocnemius but did increase for the tibialis anterior. Additionally, there were no changes in vertical jump height suggesting ankle braces do not negatively affect vertical jump height performance. Therefore, athletes who choose to wear ankle braces as a prophylactic measure should not be concerned with jumping performance when wearing them.