

THE USE OF EGM SYSTEM FOR ASSESSMENT OF TWO CONSECUTIVE AGSM EXECUTIONS

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RESUMO

Introduction: Fighter pilots are constantly submitted to physiological effects due Gz+ acceleration e.g. hypoxia, gray-out, blackout and G-LOC. These symptoms occur from difficult to keep the blood supply in the brain. AGSM is a corporal maneuver, which needs a complex motor coordination and muscle effort associate with hard and quick breathing. An effective execution of AGSM allows the human body to keep blood supply to the brain and to support high levels of Gz+. The surface EMG technique has been used as a tool to assess the engaged muscles in order to improve AGSM training. The aim of this study was assess the use of EMG technique in order to analyze muscle activity during two consecutives AGSM executions providing feedback between them. **Methods:** Nine fighter pilots from Brazilian Air Force novice in AGSM were volunteers. The electromyographic data of the gastrocnemius, vastus medialis and rectus abdominis muscles were collected (Noraxon DTS system, 1500Hz) following the SENIAM protocol. The experiment consisted of two sessions of 30s of AGSM, with an interval of one minute. Temporal data were digitally filtered (Butterworth, 4th, band [10-500 Hz] and [60 Hz] with their harmonics) and analyzed by windowed normalized RMS (nRMS) at one-second intervals with a half-second overlap. Two-way ANOVA, with interwindow and session factors (repeated measure), accompanied by post hoc Holm tests were performed ($p < 0.05$). **Results:** A nRMS increase of 11.6%, 12.9% and 8.44%, on second execution indicates an improvement of AGSM performance. This improvement was statistically significant (Figure 1). **Discussion and conclusion:** nRMS seemed to be a good EMG feature to analyze muscle activity during AGSM and provide trial-by-trial feedback. Grates improvements can indicate a pilots' low familiarity with the maneuver highlighting the AGSM training necessity. In addition, the results indicate that EMG system was able to support and quantify this improvement.

Referenciar: Massafferri, R; Coutinho, ABB; Calvo, APC. *The use of EGM system for assessment of two consecutive AGSM executions*. CISM International Symposium, Olympia, Greece, November 2021 (pg 123).

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