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Effect Of Rapid Weight Loss On Strength In Mma Fighters

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(No relevant relationships reported)

PURPOSE: The aim of this study was to verify the effect of the rapid weight loss (RWL) induced by the restriction of fluids at different moments on the manual grip strength in mixed martial art (MMA) athletes.

METHODS: Twenty-seven male amateur MMA athletes (age 24.0 ± 5.3 years, height 175 ± 8.2 cm, body mass 76.0 ± 14.66 kg) and twenty-three women (age 19,0 ± 6,9 years; height 164,0 ± 6,1 cm; body mass 66,0 ± 6,70 kg) participated in this study. All athletes had BM, handgrip strength, and hydration status assessed at baseline (10 days before the onset of RWL), the official match weigh-in, and again 24 h later (match time).

RESULTS: A repeated measures ANOVA showed for men and women, basal body weight (male: 75,0 ± 2,0; female: 66,1 ± 6,7) was significantly higher than at the time of weighing (male: 65,2 ± 2.1; woman: 56,9 ± 4,9) and match time (male: 68,5 ± 2,1, female: 59,6 ± 6,1). Density for males was higher at baseline (1.039 ± 0.1) compared to 24 h later (1.018 ± 0.1). However, women presented a difference in density for the three moments (baseline: 1,040 ± 0,2 > 1,030 ± 1,0 > 1,017 ± 0,1). In the handgrip for men it was evidenced difference between baseline (44,2 ± 13,8) and weighing (40,3 ± 17,7); however for women not found difference.

CONCLUSIONS: Rapid weight loss showed to reduce significantly manual grip strength. In addition, was observed that this technique leads the athlete to dehydration. This would possibly interfere in a negative way in the performance of the athletes. In this way, the subjective criterion of a supposed advantage in the reduction and supercompensation of the weight must be well planned so that there is no deleterious effect on the performance and health of the athlete.

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Changes In Elite Canadian Collegiate Hockey Player'S Body Compositions And Physiologic Tests Across Playing Careers

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(No relevant relationships reported)

The combined athletic and academic demands place a significant burden on collegiate hockey players. Numerous cross-sectional studies have been conducted with professional hockey players assessing body composition and skeletal fitness; yet, no research has investigated the longitudinal physiologic changes among elite collegiate athletes.

PURPOSE: To examine changes in body composition and physiologic tests across a player's collegiate hockey career.

METHODS: Over three seasons, six elite male Canadian university hockey players (age = 21.35 ± .28 years, weight = 84.53 ± 7.26 kg , height = 179.48 ± 7.60 cm, body fat percentage = 15.55 ± 1.68% at baseline) participated in the study at the beginning of their hockey seasons. All participants underwent physical testing (as outlined in the 2016 NHL combine) and a day after testing, one total body dual energy x-ray absorptiometry (DXA) scan to measure body composition.

RESULTS: A repeated measures ANOVA was used to track body composition and physiologic performance variables over a three-year period. Players gained body weight (1.66 ± 1.96 kg), total body fat percentage (2.83 ± 1.91%), visceral adiposity (.16 ± .15 kg), upper fat mass (1.57 ± 1.20 kg), and lower fat mass (.52 ± .36 kg) ($p < .05$ for all comparisons). Total and regional lean tissue mass stayed relatively constant throughout their careers. There were no significant changes in agility scores, left grip strength, long jump distance or impulse generated in the vertical jump as all of these assessments stayed relatively consistent throughout the seasons. As players progressed through their careers, they achieved significantly more bench press repetitions, pull-ups, and had higher Wingate peak power scores ($p < .05$ for all comparisons).

CONCLUSIONS: Pilot findings suggest that as players progress through their collegiate hockey careers, they gain weight, total and regional body fat, and are typically stronger in respects to some fitness tests. With this knowledge, strength and conditioning coaches can work in tandem with food scientists and nutritionists to optimize meal plans in an effort to prevent weight and adipose tissue gain which may enhance on-ice play and player health across their three-year university careers.

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The Association Among Body Composition, Explosive Leg Power and Aerobic Capacity in Male Varsity Hockey Players

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(No relevant relationships reported)

Fitness testing and body composition assessments in sports are ubiquitous and rapidly becoming an indispensible resource for strength and conditioning coaches. Previous research has shown that higher amounts of lean tissue mass have been associated with increased power outputs and lower levels of body fat percentage have been associated with improved aerobic fitness.

PURPOSE: To examine the relationship between body composition and lower body power and aerobic fitness in elite collegiate hockey players.

METHODS: Sixteen elite male Canadian university hockey players (age = 22.194 ± 0.99 years, weight = 85.74 ± 5.80 kg, height = 182.25 ± 6.67 cm), participated in the study at the beginning of their hockey season. All participants completed the long jump and the beep-test and a day after testing, one total body dual energy x-ray absorptiometry scan to measure body composition. Simple linear regression was used to explore the relationship between body fat percentage, visceral adipose tissue, and abdominal adipose tissue with aerobic fitness evaluations and leg lean with lower body power.

RESULTS: On average body fat percentage was 16.6 ± 3.0%, fat mass 13.7 ± 2.8 kg, abdominal adipose tissue 0.9 ± 0.3 kg, leg lean mass 23.8 ± 1.97 kg, long jump 2.67 ± 0.16 m, beep test 12.8 ± 1.32 min. Visceral adipose tissue explained 24.5% of the variance in the test of aerobic fitness (p .05), while other adiposity measures were non-significant. Body fat percentage and lower lean mass did not significantly contribute to aerobic fitness and lower body power respectively (all $p > .05$).

CONCLUSIONS: Despite a lack of inter-relationships among field tests and body composition, these variables should remain part a test battery to allow strength and conditioning coaches to better tailor training programs for elite hockey players.

Keywords: body composition, hockey, Fitness testing

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Comparison Of Direct And Indirect Vo_{2max} Test In Mexican College Football Players.

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(No relevant relationships reported)

Football is considered an anaerobic sport, therefore anaerobic evaluations are usually the main tests performed. Nonetheless, due to the number of plays and the duration of the game, the evaluation of the aerobic system through the measurement of the maximum oxygen consumption (VO_{2max}), becomes an important variable in the sport performance. The direct evaluation of the VO_{2max} can be expensive due to the equipment and special laboratory conditions needed to perform it.Normally, most Mexican coaches perform indirect estimation of the VO_{2max}, through field test.

PURPOSE: To determine direct VO_{2max} of a sample of a Mexican College football team and compare the measurements with two different indirect methods.

METHODS: Twenty voluntary Mexican College football players participated in the study. Informed consents were signed. Athletes were divided according to their play position into two groups: Lineman (LM) and No-Lineman (NL). Direct VO_{2max} was measured through open-circuit spirometry by indirect calorimetry during a maximal graduated exercise test, using the Bruce protocol. The first indirect measurement (FIM) was performed using the Bruce protocol equation [VO_{2max} (mL . kg^{-1} . min^{-1}) = 14.8 1.379 (time in min) + 0.451 ($time^2$) - 0.012 ($time^3$)] for a maximal graduated exercise test. The second indirect measurement (SIM) was taken using the ACSM´s running metabolic equation [VO_{2max} (mL . kg^{-1} . min^{-1}) = 0.2 (speed) + 0.9 (speed) (fractional grade) + 3.5)] in the 1.5-mile run test. VO_{2max} comparisons were made using Sperman´s correlation coefficient test.
RESULTS: **:** LM´s direct VO_{2max} (34.77 ± 10.41 mL . kg^{-1} . min^{-1}) was lower than NL´s direct VO_{2max} (46.82 ± 4.41 mL . kg^{-1} . min^{-1}). Regarding, FIM of LM (32.56 ± 7.67 mL . kg^{-1} . min^{-1}) and SIM of LM (36.87 ± 5.18 mL . kg^{-1} . min^{-1}) both of them were lower than FIM of NL (42.56 ± 3.74 mL . kg^{-1} . min^{-1}) and SIM of NL (45.96 ± 4.84 mL . kg^{-1} . min^{-1}). Correlations between direct VO 0.78 ($p<0.05$) and NL´s SIM 0.73 ($p<0.05$). and indirect VO_{2max} were as follows: LM´s FIM= 0.79 ($p<0.05$), LM´s SIM= 0.63 ($p<0.05$), NL´s FIM= 0.78 ($p<0.05$) and NL´s SIM 0.73 ($p<0.05$).
CONCLUSIONS: Indirect measurements of VO_{2max} can be used reliably to determine Mexican College football player's aerobic capacity when it is not possible or feasible to measure VO_{2max} direct.

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Relationship between Acceleration Profiles and Game Statistics among Members of a National U18 Ice-Hockey Team

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(No relevant relationships reported)

The use of player-worn sensors (PWS) has become increasingly common in team sports. We have previously shown a relationship between PWS metrics during on-ice sessions and laboratory measures in ice hockey. It is not clear, though, if metrics derived from PWS are indicative of player performance in terms of performance results based metrics (e.g. goals, assists, etc.).
PURPOSE: **:** To determine if on-ice measures obtained from PWS relate to player in-game statistics: plus/minus, goals, assists, or shots on goal.
METHODS: 19 members of the US National Team Development Program ice hockey team (17.5+.21 y, 1.82+0.8 m, 83.1+7.6 kg) consented to procedures approved by the EMU-HSRC. Zephyr Bioharness-3 (Zephyr, MD) PWS measured triaxial accelerations and heart rate for games. Data was downloaded to Omnisense (Zephyr, MD) and exported to database for mean maximal acceleration (MMA) determination. MMA from 10 - 90 sec at 10 sec intervals and from 2 - 60 min were calculated and used to determine relationships to game statistics. Game statistical data for each player for 10 games was obtained from USA Hockey, including plus/minus, goals, assists and shots on net. Pearson product correlations for game statistics and linear stepwise regressions were performed for game statistics vs. MMA using SPSS 22.0 (IBM, NY; α=.05).
RESULTS: Goals were correlated with shots (r = .35; $p<.01$), while plus/minus was correlated to goals (r = .24; $p<.01$) and shots (.14; $p<.05$). Linear regressions showed that goals were significantly related to 3 min MMA (β= .139; p =.02). Assists were related to 2 min (β= .135), 30 min (β= -.37), and 60 min (β= .226) MMA ($p<.05$). Shots were related to 3 min MMA ((β= .135; $p<.05$). No variables were accepted into the regression for plus/minus vs MMA.
CONCLUSIONS: Some metrics derived from PWS during on-ice sessions are related to game performance statistics. In particular, 2 and 3 min MMA would be indicative of a combination of anaerobic and aerobic energy system contributions and appear important for all scoring metrics.

B-60 Free Communication/Poster - **Perception**

Wednesday, May 30, 2018, 1:00 PM - 6:00 PM
Room: CC-Hall B

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Lowest Perceived Exertion In The Late Morning Due To Effects Of The Endogenous Circadian System

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Reported Relationships: S.S. Thosar: *Salary; NIH F32 award.*

INTRODUCTION: There are daily variations in the rate of perceived exertion (RPE) during exercise, with lower RPE in the beginning of the night as compared to the early morning. Whether these variations are caused by effects of the internal circadian system or daily variations in the environment or behavioral patterns is not known. It is important to determine whether the endogenous circadian system affects RPE as this could influence sports performance when athletes experience prior jetlag.
METHODS: 10 healthy adults (6 females, aged 52±2years [mean ± SEM]) participated in a protocol in dim light where all behaviors, including exercise, meals and sleep periods were evenly spread across the circadian cycle. After a normal night of sleep and baseline testing, participants underwent ten recurring 'behavioral cycles' of 2-h 40-min sleep opportunities and 2-h 40-min of standardized waking episodes. Approximately one hour after each sleep episode, participants performed cycle-ergometer exercise for 15-min at 50% predicted maximal heart rate (Karvonen's formula). The speed and resistance were identical across each cycling bout. Participants rated their exertion using Borg RPE scale after 3, 8 and 13 minutes of exercise. Salivary melatonin was used as the circadian phase marker (0º = the dim-light melatonin onset). RPE data were normalized within each participant (Z-scored), sorted into 60º (~4 h) circadian phase bins and compared across phases using repeated-measures ANOVA.
RESULTS: The circadian system significantly affected RPE, with lowest RPE in the late morning (circadian phase 210º, ≈10:45 AM) and highest RPE during the biological night (90º ≈3:45 AM).
CONCLUSION: We have uncovered an endogenous circadian effect on RPE with least perceived exertion in the late morning. This finding leads to the intriguing possibility of shifting the circadian phase of athletes (e.g. with bright light) to maximize performance, and has great relevance to athletes who experience jet lag.