

28th ECSS Anniversary Congress, Paris/France, 4-7 July 2023

Differential effects of small-sided game load on neuromuscular and perceptual-cognitive performance of youth soccer players

Skala, F., Zemková, E.

Faculty of Physical Education and Sport, Comenius University in Bratislava

INTRODUCTION:

Physical and psychological load of small-sided games (SSGs) can affect players' neuromuscular and cognitive performance [1,2]. The question remains which of load variables are responsible for the impairment of performance in youth soccer players. This study investigates players' neuromuscular and perceptual-cognitive performance i) response to SSG, ii) relationship with external load and perception of fatigue.

METHODS:

Sixteen academy soccer players (13.6 ± 0.5 y, 163.4 ± 5.9 cm, 50.4 ± 7.1 kg) underwent SSG 4v4 + GK (40x25m) consisting of six 4-min intervals separated by 1-min recovery. Exercise intensity was monitored by the tracking system Polar Team Pro (Polar, Kempele, Finland). Before and after SSG a 100-mm visual analog scale (VAS-F) determined subjective perception of fatigue, followed by planned (PA) and reactive (RA) agility tests, countermovement jump (CMJ), divided attention task (DA), and go/no-go task (GNG). Paired t-test and Wilcoxon signed-rank test were used to analyze performance changes. Individual pre-post differences () were aligned with load variables to calculate Pearson's (r) or Spearman's (rs) correlation coefficients.

RESULTS:

Players achieved $87 \pm 4\%$ HRmax with a relative distance covered of 92 ± 7 m/min. Subjective perception of fatigue increased after SSG ($41.56 \pm 14.02\%$, $p = .001$). Further, CMJ height decreased ($-6.67 \pm 6.64\%$, $p = .014$, $d = .56$), whilst PA time ($3.71 \pm 2.50\%$, $p = .002$, $d = .97$), RA time ($6.60 \pm 7.36\%$, $p = .003$, $d = 1.78$) and errors in GNG increased ($46.43 \pm 138.3\%$, $p = .039$, $d = .59$). There were no significant changes in DA task errors ($3.66 \pm 16.81\%$, $p = .362$, $d = .22$) and speed of response in GNG task ($-3.36 \pm 8.04\%$, $p = .119$, $d = .29$). Additionally, significant correlation was found between PA and VAS-F ($r = .60$, $p = .014$), and moderate between PA and low to medium intensity decelerations ($r = .48$, $p = .061$). RA correlated significantly with CMJ height ($r = -.54$, $p = .031$) and moderately with GNG errors ($r_s = .47$, $p = .123$). Sprinting distance (21 km/h) and maximal speed in SSG correlated with CMJ height ($r_s = .66$, $p = .006$; $r = .54$, $p = .032$) while high-intensity accelerations correlated with PA ($r = -.76$, $p = .002$).

CONCLUSION:

Fatigue induced by SSG load affects youth players' agility, explosive strength, and decision-making in visual inhibition task. PA time was associated with fatigue perception and low to medium intensity decelerations. In addition, there was a relationship between explosive strength decrement and RA time. This variable was moderately associated with increased errors in GNG task. However, players who covered a longer sprinting distance and achieved higher maximal speed in SSG had smaller decrement in CMJ height, and those producing a higher number of high-intensity accelerations had smaller increase in PA time. High-intensity actions in SSG may, to some extent compensate for neuromuscular performance decline in young players.

1. Bujalance-Moreno et al. (2020). *Kinesiology* 52(1), 46-53
2. Mitrotasios et al. (2021). *Facta Universitatis* 19(2), 139-153

Topic: Training and Testing

Presentation Poster

European Database of Sport Science (EDSS)

Supported by SporTools GmbH



32325