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Short-Term Effects of COVID-19 on Physical Performance, Training Load and Mental Health — A study of Chinese Young Well-Trained Sprint Kayakers

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INTRODUCTION:

COVID-19 has a complex impact on multiple body systems affecting both physical performance and mental health [1]. Evidence-based information on the effects of COVID-19 on athletes' performance can help towards safe return-to-play protocols and clinical management strategies [2]. This study aims to examine the short-term effects of COVID-19 on physical performance, training load, and mental health in young well-trained sprint kayakers during the 2022-2023 season.

METHODS:

17 kayakers (8 male, 9 female, age 17.5 ± 1.6 yrs, height 176.03 ± 7.02 cm, body mass 68.8 ± 10.0 kg; mean $\pm$ SD) underwent two upper-body strength tests and anthropometric measurements before (2 weeks) and after a mild COVID-19 infection (up to 2 weeks after retraining). Mild COVID-19 infection was defined as being without hospitalization and without any health complications lasting longer than 14 days [3]. Peak and mean power output (PP and MP), peak and mean propulsion velocity (PV and MV), and 40-s maximal repetitions of bench pull and bench press were measured with a linear transducer (Gymaware) before and after COVID-19. CR-10 session rating of perceived exertion (sRPE) for training load and Hooper questionnaire for mental status were measured daily and averaged weekly. Nose swab PCR/antigen tests for COVID-19. Statistical analysis included the use of Wilcoxon signed rank test, Student t-test, Pearsons and Spearmans r correlation coefficients.

RESULTS:

Duration of main symptoms, detraining, and retraining was 2.9 ± 1.1 , 10.4 ± 1.8 , and 12.1 ± 1.1 days. There was a significant improvement in body mass, fat-free mass, muscle mass, flexed biceps circumference, absolute and relative PP, and MP of bench pull before and after COVID-19 ($p < 0.05$). There was a significant reduction in training hours per week, sRPE, sRPE-TL, fatigue levels, muscle soreness levels, and Hooper index before and after COVID-19 ($p < 0.05$). However, the duration of main symptoms and detraining were negatively correlated with PP, MP, and PV of bench press after COVID-19 [range $r = -0.51$ ($p < 0.05$) to $r = -0.67$ ($p < 0.01$)]. Duration and training hours per week of retraining were positively correlated with body mass, fat-free mass, muscle mass, flexed biceps circumference, PP, MP, PV, and MV of bench pull and bench press [range $r = 0.50$ ($p < 0.05$) to $r = 0.73$ ($p < 0.001$)]. Sleep quality, stress, fatigue, muscle soreness levels, and Hooper index during the retraining period were negatively correlated with PP and MP of bench pull and bench press [range $r = -0.48$ ($p < 0.05$) to $r = -0.85$ ($p < 0.001$)].

CONCLUSION:

A mild COVID-19 infection resulted in changes of anthropometric, training, mental health, and performance variables, but did not result in a reduction of physical performance in well-trained young athletes after short-term retraining. The results of this study will provide valuable information to inform clinical management and improve return-to-play protocols.

1. Lemes et al. (2022) 2. Kaulback et al. (2022) 3. Šliž et al. (2022)

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