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Influence of CMV/EBV serostatus on respiratory infection incidence during 4 months of winter training in a student cohort of endurance athletes

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ABSTRACT

The purpose of this study was to examine the influence of previous infection with cytomegalovirus (CMV) or Epstein Barr virus (EBV) on the incidence, severity and duration of upper respiratory tract illness (URTI) episodes in endurance athletes during a 4-month winter training period. Blood samples were obtained from 236 healthy subjects (186 males, 70 females) who were engaged in regular sports training (predominantly endurance-based activities such as running, cycling, swimming, triathlon, team games and racquet sports) at the start of the study period for CMV and EBV serostatus analysis. Their baseline characteristics were (mean ± SD) age: 21 ± 2 years, body mass: 73.5 ± 11.2 kg, height: 176.5 ± 9.3 cm, body mass index 23.6 ± 2.2 kg/m^2. Weekly training and daily illness logs were kept. Self-reported weekly training duration averaged 9.6 ± 5.2 h/week and 4.0 ± 1.6% of the cohort experienced a URTI episode each week. Twenty-five percent of the subject cohort were CMV positive with a similar proportion in males (24%) and females (26%) whereas 84% of the subject cohort were EBV positive with a similar proportion in males (84%) and females (83%). In addition, 21% of the subject cohort were both CMV and EBV positive (CMV+EBV+) whereas 13% of the subject cohort had no prior CMV or EBV infection (CMV-EBV-). With regard to CMV/EBV serostatus, the results indicated that there was no difference in the proportion of subjects who presented with symptoms of infection between CMV/EBV positive and negative groups. Athletes with previous CMV infection had fewer URTI symptom days during the study period than those with no previous infection [mean and interquartile range (IQR), positives 2 (0-7) days, negatives 4 (1-9) days, P = 0.033] and EBV serostatus had no influence on URTI episode incidence, severity or duration. Moreover, we found that athletes with prior infection of both CMV and EBV had fewer URTI episodes and symptom days than athletes who were seronegative for both CMV and EBV [mean (IQR), URTI episodes: positives 0 (0-1), negatives 1 (0-2), P = 0.04; symptom days: positives 2 (0-7), negatives 8 (2-12), P = 0.01]. The reasons for this are still unclear but could be related to the previously reported elevated T cytotoxic cell response to exercise in individuals with positive CMV serostatus. Previous coinfection with CMV and EBV might promote protective immune surveillance to lower the risk of URTI.