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REACTIVATION OF EPSTEIN-BARR VIRUS FOLLOWING PROLONGED CYCLING

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KEYWORDS: Epstein-Barr virus; immunoglobulin A; cycling.

Epstein-Barr Virus (EBV) is a herpes virus that typically infects 80-90% of adults, establishing lifelong latent infection in epithelial cells and B-lymphocytes in the oropharynx. Under significant physical and/or psychological stress the immune system's ability to keep EBV latent may be lost and reactivation may occur so EBV DNA appearance in saliva (in carriers) may serve as an *in vivo* marker of immune status. Prolonged exercise can cause a transient immune depression for up to 24 h post exercise⁽¹⁾. However it is currently unknown what effect this has on the control and subsequent reactivation of EBV in the hours following exercise. The objective of this study was to investigate the acute effect of prolonged cycling on EBV reactivation and other immune markers in blood and saliva up to 44 h post exercise. Following ethics approval, eight trained male cyclists (mean $\pm$ SD) age 31 ± 8 yrs, $\text{VO}_{2\text{max}}$ 58.7 ± 9.0 ml $\cdot$ kg⁻¹ $\cdot$ min⁻¹ volunteered to take part. In a randomised design, after an overnight fast participants cycled at 20%D or rested for 2.5 h. Unstimulated saliva samples were provided upon waking on the morning of each trial as well as the two following mornings. Unstimulated saliva and venous blood samples were collected immediately pre, post, and 1 h post exercise/rest. EBV DNA was measured using quantitative polymerase chain reaction (qPCR). EBV serology and salivary immunoglobulin A (s-IgA) were determined by ELISA. Venous blood samples were analysed for white blood cell counts. All eight participants were EBV seropositive and EBV DNA was detected in saliva of three participants during the study period. A pre-to-post-exercise increase in EBV viral load was evident in two of these typically occurring at 20-44 h post-exercise (with an average 10-fold increase in EBV viral load). Neutrophil cell counts significantly increased pre-to-post-exercise (1.8 ± 0.8 to $7.8 \pm 2.7 \times 10^9/\text{L}$, $P < 0.05$) and remained elevated at 1 h post ($9.0 \pm 2.6 \times 10^9/\text{L}$, $P < 0.05$). s-IgA concentration significantly decreased from waking to post and

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1 h post-exercise ($P<0.05$). s-IgA concentration and secretion rate significantly increased from post and 1 h post to 20 and 44 h post-exercise ($P<0.05$). No post-exercise increase in EBV DNA was detected in saliva for the majority of subjects (75%) and for those who did experience an increase it typically peaked 20-44 h post-exercise. There was evidence of a significant stress response to the exercise (e.g. cell trafficking and s-IgA) so perhaps a more strenuous (or prolonged) exercise bout would result in greater changes in EBV viral load, however this requires further research. Further exploration of the time period between 1 h and 20 h post-exercise would also be valuable.

REFERENCES

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