Effects of Training Periodization on Condition Changes with Menstrual Cycle in Female Athletes

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INTRODUCTION:
Athletes are expected to perform at important competitions, but it has been reported that many athletes fall ill with the common cold before international competitions and other events. To avoid such a situation, it is important to evaluate the condition of athletes. One of these is the use of immune function evaluation indices. Athletes also train on a daily basis based on training periodization, which can be divided into two main periods: the preparation period and the competition period. In addition, it has been reported that the condition of female athletes changes with the menstrual cycle. However, the effect of training periodization on menstrual cycle-related condition fluctuations in female athletes has not been determined. The purpose of this study was to investigate the effects of training periodization on menstrual cycle-related changes in condition in female athletes using secretory Immunoglobulin A (SIgA).

METHODS:
The subjects were 15 college female track and field athletes (jumper and thrower, age 20.0±1.1 years, height 162.6±5.2 cm, weight 55.9±6.5kg). The subjects were asked to collect saliva samples in a fasting state after waking up during the menstrual, follicular, and luteal phases of the competition period and preparatory period. From subject's saliva samples, saliva flow rates and SIgA concentrations were determined and SIgA secretion rates were calculated.

RESULTS:
A two-way repeated ANOVA showed a significant difference in the interaction effect on salivary secretion rate ($F_{(2,28)}=3.648$, $p=0.039$, partial $^2=0.207$), and a simple main effect test showed that salivary secretion rate during the menstrual phase was significantly lower in competition period ($p=0.006$) and in the preparatory period were significantly lower in the follicular phase than luteal phase ($p=0.029$). SIgA concentrations did not show significant differences in menstrual phases or training periods ($F_{(2, 28)}=2.144$, $p=0.136$, partial $^2=0.133$). SIgA secretion rates showed a significant difference in the interaction effects ($F_{(2,28)}=3.891$, $p=0.032$, partial $^2=0.217$), and a simple main effect test showed that SIgA secretion rates in the preparatory period were significantly lower in the follicular phase than luteal phase ($p=0.013$).

CONCLUSION:
In female athletes, training periodization was found to influence SIgA changes with the menstrual cycle.

Topic: **Training and Testing**

Presentation   **Oral**

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