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| **Greater ventilatory irregularity during steady-state exercise in adolescents versus adults.** |
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| **Introduction/Aim:** The control of exercise ventilation, which comprises of feedback and feedforward mechanisms, is challenged during adolescence by physiological changes in respiratory system characteristics. We subjectively observed that healthy adolescents demonstrate irregular breathing patterns during incremental exercise compared healthy adults. However, due to the increasing workload profile of incremental exercise we were unable to objectively quantify the irregularity of breathing patterns. Submaximal steady-state exercise provides a stable workload profile and sufficient data sample for non-linear analysis techniques such as approximate entropy (ApEn) analysis to be used. This study aimed to use ApEn analysis to quantify and compare the ventilatory response during steady-state exercise of physically active and healthy adolescent versus adult subjects. **Method:** Two groups were recruited: the adult group (n=9, 5F:4M, age 25-35 yrs.) and the adolescent group (n=12, 7F:5M, age 12-14 yrs.). Subjects performed 15-minutes of steady state exercise on a cycle ergometer at a workload of 1 W·kg-1 of body weight. ApEn analysis was performed for VE, VT, and Bf. The Mann-Whitney U test compared ApEn results between the groups and alpha was set at 0.05.**Results:** ApEn was significantly higher for the adolescent group compared to the adult group for VE (1.25 ± 0.13 vs. 1.03 ± 0.02), Bf (1.28 ± 0.05 vs. 1.12 ± 0.11, p<0.05) and VT (1.31 ± 0.07 vs. 1.19 ± 0.11, p<0.01).**Conclusion:** Using ApEn analysis we showed greater irregularity of VE, Bf and VT for healthy adolescent compared to healthy adult subjects. We propose that the greater irregularity of breathing patterns observed in adolescent subjects likely reflects the development and maturation of ventilatory control and should not be viewed as abnormal. **Key Words:** Approximate entropy, ventilatory control, adolescence**Grant Support:** This research was supported by an award from The Green Lane Research and Education Fund. |