

PARTICIPATION OF ABDOMINAL AND CHEST BREATHING IN DIFFERENT POSITIONS DURING A COMPLETE BREATHING CYCLE

Szonja Decker, Darina Deák, Tamás Horváth, Akos Koller, Department of Morphology & Physiology, and Institute of Translational Medicine, ELKH-SE Cerebrovascular and Neurocognitive Disorders Research Group, Semmelweis University, Research Center for Sports Physiology, Hungarian University of Sports Science, Budapest, Hungary

Keywords: optimal breathing, respiratory frequency, COVID-19, cardiorespiratory function, athletes

Aims: In COVID-19 disease the position of patients significantly affected the mortality rate. Thus, we aimed to measure the participation of abdominal and thoracic breathing in different positions during resting conditions. We hypothesized that abdominal (AB) and thoracic breathing (TB) participate differently in the respiratory cycle. **Method:** Using plethysmography respiratory belts changes in the circumference of the chest and abdomen cavities were measured in young men and women (n=14; age:21.3±1.8 years) during calm inhalation and

26

exhalation. The following positions were used: standing (St), sitting (Si), supine (Su), prone (Pr), and all on fours (Af).

Results: Respiratory frequency (1/min) did not change significantly in different positions (Si: 15.0, St: 15.2, Su: 14.7, Pr: 14.9, Af: 13.8). However, the percent ratio of AB and TB changed significantly. AB gradually increased while TB gradually decreased in the following order: Si: 62/38%, St: 65/35%, Su: 75/25%, Pr: 61/39%, Af: 55/45%. For example, AB was significantly higher than TB in the Su position, while there was no significant difference between AB and TB in the Af position.

Conclusion: While maintaining a constant respiratory frequency, different positions significantly affect the participation of AB and TB during complete respiration. Therefore, Optimizing the participation of AB and TB breathing may improve the breathing of patients and athletes.