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MUSCULAR BLOOD FLOW AND OXYGENATION IN HEALTHY CHILDREN AND ADOLESCENTS MEASURED BY NEAR INFRARED SPECTROSCOPY

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Background: The measurement of muscular blood flow and oxygenation by near infrared spectroscopy (NIRS) is a relatively new method. Till now no data are available for healthy children and adolescents.
Aim: The aim of the study was to measure muscular forearm blood flow (FBF) and O2 supply index (OI) in healthy children and adolescents by means of NIRS in order to analyse, if there are any age dependent differences.
Methods: 19 male and 21 female children and adolescents at the mean age of 12,7 (7-17,5) years were analysed. Measurements were performed during venous occlusion at rest and after one minute rhythmic handgrip exercise. FBF and OI at rest and the increase of both parameters after exercise were correlated to age.
Results: FBF at rest was 1.9±1.2ml/100gmuscle in the 40 children and adolescents and increased by 1.1±1.0ml/100gmuscle after exercise. OI at rest was 32,1±19,1 OD/min and increased by 19,6±18,2 OD/min after exercise. At rest a significant negative correlation of age was observed to FBF and OI. With increasing age the FBF and OI decreased. After exercise a significant positive correlation of age was observed to increase of FBF and OI. With increasing age the increase of FBF and OI after exercise became higher. Between male and female children and adolescents there were no significant differences.
Conclusion: FBF and OI show age dependent differences at rest and after exercise. FBF and OI became lower and the increase of the two parameters after exercise became higher with increasing age.