Cerebrovascular Response to Different Stimulations and Patterns in Healthy Volunteers

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摘要

Abstract

The purpose of this study was using Transcranial Doppler to investigate the reactions in cerebral blood flow during different stimulations such as, reading article, mental calculation, lifting right hand, and lifting left hand. Seven right-handed healthy volunteers accepted four stimulations and each stimulation had constant type (i.e., Type Ⅰ) and vary type (i.e., Type Ⅱ). Stimulation procedure consists 10 consecutive cycles, each comprising 20s stimulation phase and 20s rest phase. The data analysis was done by analyzing the percent of maximal and mean blood flow velocity (BFV) increase during 20s stimulation phase in the left and right middle cerebral artery (MCA) compared with baseline which are the averaged velocity at rest 5s prior to the beginning of stimulation phase. We also calculated the degree of lateralization (i.e., side-to-side difference) which was one side of BFVI% minus the other side in these four different stimulations and patterns. The other analysis was comparing BFV increase of first 5 cycles to last 5 cycles to check the habituation. The results indicate all stimulation can raise maximum increase of BFV about 10% but the average increase of BFV was varying. Moreover, in both Types of reading aloud and lifting left hand, the difference of maximal and mean BFV increase were significant difference between in the left and right MCA ($P<0.05$). Furthermore, in task of reading aloud and calculation, habituation effect was existed in Type Ⅰ ($P<0.05$) and canceled in Type Ⅱ.