



INFLUENCE OF SOME EXPERIMENTAL PARAMETERS ON THE RELATION BETWEEN THE REACTION TIME AND THE AMPLITUDE CHANGES OF THE H-REFLEX

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A number of authors look for changes in the H-reflex amplitude during a voluntary movement preparations in reaction time tasks . Our former researches of the relation between the reaction time and the amplitude changes of the H-reflex in different experimental series convinced us that this relation is subject to changes that probably reflect the predisposition for the performance of a voluntary movement, that is individual. Such factors as age and physical condition change the curve of that relation. A change in some of the parameters of the experiment may influence its character, too. This led us into a research in order to find out whether the position of the body of the subject is not a condition for a change of that relation. This is the object of the present investigation.

The experiment was carried out in two series with the participation of four healthy men aged between 24 and 28. In the first series they were sitting comfortably on a chair, and in the second they stood upright. A broad description of the methods used for reaction time and H-reflex registration, one day's program and statistical data processing are to be found in . The data from the series in sitting position are shown on fig. 1, and in an upright position on fig. 2.

The relation between the reaction time and the amplitude changes of the H-reflex shows a significant difference in the two positions. While the curve in a sitting position has approximately a linear course, the reaction time becoming shorter with the increase of the amplitude of the H-reflex, in an upright position of the subjects it has the course of a curve with a minimum, the reaction time being the shortest at an amplitude of the H-reflex equal to the amplitude of a H-reflex at rest. We suppose that in the first case the reaction time is shortened due to a greater excitability of the spinal motoneurons, the electrophysiological correlate of which is the increase of the H-reflex amplitude. In the second case the curve is close to that obtained from other healthy men from Tsekov, Gerilovski , but it differs from it by the greater variability of the H-reflex amplitude changes. It is possible for the upright position of the body which demands the participation of the supraspinal structures and their subordinative

spinal structures into the posture maintenance as well as into the preparation for the movement, to impede the performance of the movement, and for this reason the reaction time to be the shortest, when the excitability of the structures, responsible for the H-reflex, is equal or close to that of the same structures at rest.

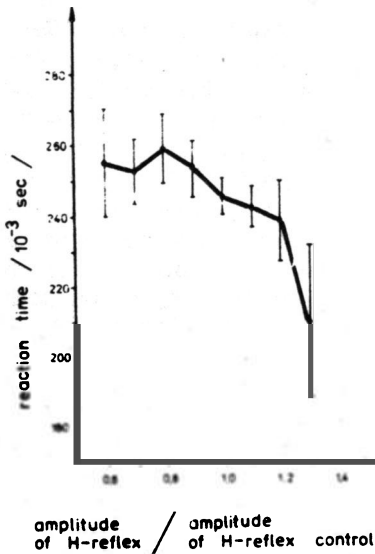


Fig. 1. Reaction time mean values of H-reflex evoked from the lateral belly of the gastrocnemius muscle of the right leg (amplitude of the H-reflex compared to an amplitude of a control H-reflex). Bars at every point indicate confidence limits calculated at $p=0,05$. The movement is a plantar flexion of the right heel

Fig. 2. Reaction time mean values of the H-reflex, evoked from the lateral belly of the gastrocnemius muscle of the right leg (amplitude of the H-reflex compared to an amplitude of a control H-reflex).

