**1-A-2 Influence of periodically Ia afferent input from antagonist muscle on spinal reciprocal Ia inhibition circuit**

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**Purpose:** The main aim of this research is to investigate whether periodically Ia afferent input from antagonist muscle affects the strength of reciprocal Ia inhibition.

**Methods:** The degree of reciprocal Ia inhibition and the conditioning effect of transcranial magnetic stimulation (TMS) on the Soleus (Sol) H-reflex was examined in healthy subjects. The periodically electrical stimulation was applied on common peroneal nerve every 1 sec (100Hz-5strain), which is matched with the cycle of human locomotion (1Hz). The amount of reciprocal Ia inhibition and TMS conditioned H-reflex amplitude were assessed before and after 15 min of electrical stimulation at motor threshold intensity of tibialis anterior muscles.

**Results:** Periodically Ia afferent from antagonist muscle increased the degree of reciprocal Ia inhibition and the extent of short-latency inhibitory effect on TMS-conditioned H-reflex, which are not concomitant with the change in Sol motoneuron excitability.

**Discussion:** Our results suggested that Ia inhibitory interneurons are sensitive to periodically Ia afferent input because the change in the amplitude of the TMS-conditioned H-reflex was only observed in the specific condition-test interval which is presumed to mediate Ia inhibitory interneurons. These findings may imply that rhythmic afferent input modifies the Ia inhibitory interneurons activity.

**Key Words:** Reciprocal Ia inhibition, Soleus H-reflex, Ia afferent input

**1-A-3 Changes in ipsilateral primary motor cortex excitability after performing a sensorimotor task**

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**Purpose:** To examine changes in ipsilateral primary motor cortex excitability assessed by motor evoked potentials (MEP) after performing a fine-motor manipulation (FM) task as a sensorimotor task where in 20 right-handed subjects were tested.

**Methods:** Transcranial magnetic stimulation (TMS) was delivered to the primary motor cortex (M1) in order to evoke MEP from the contralateral first dorsal interosseous (FDI) muscle. MEP, short-interval intracortical inhibition (SICI), and interhemispheric inhibition (IHI) were measured before and after performing the FM task. The test stimulus intensity was adjusted to evoke MEP of ~1mV. The conditioning stimulus (CS) intensity for SICI was adjusted to produce ~50% inhibition of the MEP evoked by the TS alone. Three CS intensities, 1.0, 1.2, and 1.4 times the resting motor threshold, were set for IHI. The FM task was performed with the non-dominant left hand (total 18 min with 7 min rest).

**Results and Discussion:** A reduction in the MEP amplitude was recorded in the right FDI immediately after performing the FM task. Decreased SICI (after 10, 20, and 30 min) was detected in the ipsilateral M1 with no changes in IHI from the innervating side to the non-innervating side. The results of the present study suggest that SICI in the ipsilateral M1 decreased in order to recover ipsilateral M1 excitability.

Key words: Sensorimotor task, TMS, Ipsilateral M1