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Effect of Vitamin В1 Alimentary Deficiency on Spontaneous and Evoked Transmitter Release in Murine Neuromuscular Synapses

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Using a microelectrode technique, we studied the effects of alimentary vitamin В1 deficiency on synaptic transmission in isolated phrenico-hemidiaphragmatic murine preparations. Animals of group І (control) were on a standard thiamine-controlled diet (16 mg/kg thiamine) with no limitations. Animals of group II (control with alimentary limitation) were on the same diet, but daily consumption in these animals was limited and made similar to the amount of food consumed by the animals of group ІІІ within idential periods of cage housing (for differentiation of the effects of anorexia related to the thiamine-deficient state in group III and proper effects of В1 hypovitaminosis). Animals of group ІІІ (thiamine-deficient) were on a standard diet (with no limitations) mostly analogous to that in group І but containing no thiamine. In phrenicohemidiaphragmatic preparations obtained from animals of group ІІІ, the amplitude of end-plate potentials (EPPs) and miniature EPPs (mEPPs) on the 10th day of consumption of the thiamine-defficient diet and the quantum composition of EPPs on the 20th day became significantly (*Р*< 0.01) smaller than in preparations obtained from animals of both groups І and ІІ. The frequency of mEPPs and membrane potential of muscle fibers in group ІІІ remained unchanged. Two processes, a decrease in the dimension of the transmitter quantum (which is observed within rather early stages of the development of thiamine-defficient state) and a decrease in the quantum composition of evoked EPPs (at later stages) underlie a gradual decrease in the amplitude of EPPs related to the development of alimentary vitamin В1 deficiency.

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* **thiamine**
* **end-plate potentials**
* **thiamine-deficient state**

