

Sleep-promoting effects of the GABA/5-HTP mixture in vertebrate models.

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Abstract

The aim of this study was to investigate the sleep-promoting effect of combined γ -aminobutyric acid (GABA) and 5-hydroxytryptophan (5-HTP) on sleep quality and quantity in vertebrate models. Pentobarbital-induced sleep test and electroencephalogram (EEG) analysis were applied to investigate sleep latency, duration, total sleeping time and sleep quality of two amino acids and GABA/5-HTP mixture. In addition, real-time PCR and HPLC analysis were applied to analyze the signaling pathway. The GABA/5-HTP mixture significantly regulated the sleep latency, duration ($p < 0.005$), and also increased the sleep quality than single administration of the amino acids ($p < 0.000$). Long-term administration increased the transcript levels of GABAA receptor (1.37-fold, $p < 0.000$) and also increased the GABA content compared with the control group 12h after administration (1.43-fold, $p < 0.000$). Our available evidence suggests that the GABA/5-HTP mixture modulates both GABAergic and serotonergic signaling. Moreover, the sleep architecture can be controlled by the regulation of GABAA receptor and GABA content with 5-HTP.

KEYWORDS: 5-Hydroxytryptophan; Electroencephalogram; Pentobarbital; Sleep; Vertebrate; γ -Aminobutyric acid

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