Chapter V

Conclusion

In comparison to its parent drug (VPA), the present microdialysis study investigated the effect of HPP on the level of inhibitory (GABA and glycine) and excitatory (glutamate and aspartate) amino acid neurotransmitters in freely moving rats. The results showed that HPP significantly decreased basal glutamate level in the dose of 80 and 160 mg/kg B.W. while VPA significantly decreased basal glutamate level only in high dose but not at the dose closed to its ED_{50}. HPP and VPA did not affect the cortical level of GABA, glycine and aspartate in freely moving rats. In the whole-cell patch clamp study, HPP did not affect the $GABA_A$, glycine and NMDA induced inward currents. Therefore, it was suggested that at least, the decrease in the level of excitatory neurotransmitter, glutamate, could account for the anticonvulsant activity of HPP.

In conclusion, the present studies demonstrated that mechanisms of anticonvulsant action of HPP may not relate to an inhibitory amino acid neurotransmission, especially, GABA and glycine but an inhibition of excitatory neurotransmission may involve. This result suggests that inhibitory effect of HPP on pre-synaptic excitatory glutamate neurotransmission is relevant to its anticonvulsant effect observed in animal models. Further investigation is needed to clarify mechanism underlying the inhibitory effect on cortical glutamate level of HPP.