



Neurotransmitters in caudate nucleus substantia nigra and dorsal vagal nucleus involved in inhibitory effect of substance P of caudate nucleus on gastric myoelectric activity and motility

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Abstract

AIM: Our previous study showed that the inhibitory effect of substance P (SP) of caudate nucleus on gastric motility was realized by dopamine (DA) and acetylcholine (Ach) of caudate nucleus, and the effects were mediated by substantia nigra and dorsal vagal nucleus *via* vagus nerve. In present study, the relationship of inhibitory effect of SP of caudate nucleus with DA, Ach as well as gamma-aminobutyric acid (GABA) in caudate nucleus, substantia nigra and dorsal vagal nucleus was investigated by immunocytochemical staining technique.

METHODS: Male sprague-Dawley rats (180-220 g/body weight) were used. The inhibitory effect on gastric myoelectric activity and motility were induced after microinjection of SP into caudate nucleus,

the immunocytochemical technique was used.

RESULTS: (1) Both tyrosin hydroxylase (TH) immunoreactive fibers and the number of choline acetyltransferase (ChAT) positive cells were increased in caudate nucleus. It suggested that SP-induced inhibition was realized BY DA, Ach. (2) Meanwhile, the increase of GABA-immunoreactive cells were increased in substantia nigra; But that of SP and TH not. (3) The number of ChAT-immunoreactive cells as reduced in dorsal vagal nucleus; While that of SP and GABA were increased.

CONCLUSION: It suggested that DA, Ach and GABA in caudate nucleus, GABA and Ach in substantia nigra, and SP, GABA in caudate vagal nucleus presumably participate in the inhibitory effects of SP in caudate nucleus on gastric myoelectric activity and motility.

Key words: Neurotransmitters; Caudate nucleus; Substantia nigra; Dorsal vagal nucleus; Substance P; Gastric myoelectric activity; Motility

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