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NEURONAL ACTIVITY IN THE RAPHE NUCLEI RELATED TO MICTURITION AND STORAGE IN CATS

Hypothesis / aims of study

Impulses after stimulation of the bladder ascend through the afferent axons to the pontine micturition center (PMC) in dorsal region of pons. Then the signals feed back to the bladder and sphincter and prompt urination. Raphe nuclei exist in ventromedial region of PMC. It is confirmed that electrical or chemical stimulation of the raphe nuclei in the cat inhibited reflex bladder activity, indicating that endogenously released 5-HT has an inhibitory effect on bladder function. But the detail has not been clear. We had a hypothesis that if there were some kinds of relationship between the raphe nuclei and bladder activity, bladder stimulation might cause neuronal firing in the raphe nuclei.

Study design, materials and methods

We examined ten cats that were fixed in stereotaxic apparatus, and fine electrode was inserted into the raphe nuclei according to Horsley-Clarke stereotaxic coordinates (P2-P8, R1-L1, H-1 to H-9). We injected water in the cat's bladder through transurethral catheter and stimulated the bladder. Then we recorded neuronal activity in the raphe nuclei in response to bladder contraction/relaxation cycles.

Results

The neuronal firing (n=57) was found in response to bladder contraction/relaxation cycles in the raphe nuclei and the adjacent area. Storage-firing neurons (42) were more common than micturition-firing neurons (15), with different locations respectively.

Interpretation of results

In the raphe nuclei there were micturition-related neuronal firings, the majority of which seemed to relate with urinary storage function.

Concluding message

Previously electrical or chemical stimulation of the raphe nuclei in the cat inhibited bladder activity. Our study results support the idea that the raphe nuclei seem to modulate urinary storage function.

Reference

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