NGF DOES NOT ALTER INTRAMUSCULAR GLUTAMATE CONCENTRATION IN RAT MASSETER MUSCLE

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INTRODUCTION / AIM

Glutamate concentrations are higher in the masseter muscles of patients with myofascial temporomandibular disorders (TMD) than in healthy controls. In rats, intramuscular injection of nerve growth factor (NGF) has been used to model myofascial TMD. It induces masseter muscle sensitization, in part, by increasing the expression of NMDA glutamate receptors by mechano-nociceptors. This study investigated whether NGF also alters the interstitial concentration of glutamate in the rat masseter muscle.

METHODS

Male and female rats (n=5/sex) received injections of NGF (25 μg/ml, 10 μl) and vehicle (PBS) into the right and left masseter muscles, respectively. Three days after injection, the rats were anesthetized and microdialysis probes (MAB 1.2.4. PES with 6kDa cutoff) were inserted into the muscles at the site of injection. The probes were perfused with PBS at a rate of 2 μl/min. Glutamate concentrations in the dialysates were quantified using an ELIZA kit.

RESULTS

In the male rats, the interstitial glutamate concentrations were 17.8 ± 4.4 and 13.1 ± 1.8 μM in the PBS and NGF-injected sides, respectively. In the female rats, the concentrations were 21.6 ± 9.8 and 16.2 ± 9.2 μM in the PBS and NGF-injected sides, respectively. The differences between the PBS and NGF-injected sides were not significant in both sexes.

DISCUSSION / CONCLUSIONS

NGF does not alter interstitial glutamate concentration in the masseter muscle. These results suggest that NGF does not affect the peripheral glutamatergic system through increasing glutamate release in the muscle.

OTHER AUTHORS

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