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Changes In The Expression Of Calcitonin Gene-related Peptide After Exposure To Stretch-shortening Contractions: 609: June 2 10:15 AM - 10:30 AM

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Muscle inflammation and hyperalgesia induced by adjuvant injection into skeletal muscle are associated with an increase in calcitonin gene-related peptide (CGRP) labeling in skeletal muscle and dorsal root ganglia (DRG). This increased expression of CGRP may contribute to the maintenance of pain in these models. However, it is not known if inflammation induced by repetitive exposure to stretch-shortening contractions (SSCs) results in hyperalgesia and increased concentrations of CGRP in the DRG.

PURPOSE: The goal of this study was to determine if skeletal muscle damage induced by exposure to SSCs resulted in hyperalgesia of the hind limb and changes in CGRP immunolabeling in the DRG in young and old male rats.

METHODS: Young (12 weeks) and old (30 months of age) male Fisher 344 × F1 (N=32) were anesthetized with isoflurane and the left dorsiflexor muscles were exposed to 15 sets of 10 SSCs. Control animals were exposed to 15 isometric contractions of equal intensity. Sensitivity to mechanical stimulation was assessed using von Frey filaments prior to the exposure and on days 2 and 9 after the exposure. Rats were euthanized one day after testing, on day 3 or 10. The ipsilateral (left side) DRG were dissected from the L2-5 region of the spine, embedded in OTC, frozen on dry ice and stored at -80°C until sectioning. Transverse sections of the DRG were cut in a cryostat, thaw mounted onto pre-coated slides, and stored at -80°C until immunostained for CGRP. Immunohistochemistry was performed using standard procedures and the area labeled for CGRP was measured using SCION Image.

RESULTS: All rats exposed to SSCs were more sensitive to mechanical stimulation than control rats 2 days after the exposure. These changes in sensitivity were not associated with increases in CGRP labeling in the DRG. However, 9 days after the exposure, old rats exposed to SSCs still displayed an increased sensitivity to mechanical stimulation, and this hyperalgesia was associated with an increase in CGRP immunolabeling in the DRG. Young rats did not display a change in CGRP immunolabeling at this time point.

CONCLUSIONS: These findings suggest that hyperalgesia seen shortly after exposure to SSC is not influenced by CGRP levels. However, in cases where recovery from injury may be slower, as it is in older rats, CGRP may contribute to the maintenance of hyperalgesia.