Introduction

Pain problems are more prevalent in Native Americans than any other group in the U.S.; however, little is known about pain processing in this group. In fact, there are currently no studies of pain processing in Native Americans relative to a white, non-Hispanic control group. Pain processing was assessed from pain intensity ratings of suprathreshold electric stimuli, electric pain threshold/tolerance, and temporal summation of pain and NFR.

Objective

To examine pain processing in Native Americans relative to a white, non-Hispanic control group.

Participants

- Healthy Native American (N = 22) & white, non-Hispanic (N = 20) participants
- Age (yrs)
  - Mean: Native American = 21.9 ± 4.1; White = 21.5 ± 4.2
  - SD: Native American = 4.1; White = 4.1

- % Female
  - Native American = 50%; White = 45%

- Education (yrs)
  - Mean: Native American = 16.4 ± 3.1; White = 16.3 ± 3.2
  - SD: Native American = 3.2; White = 3.1

- Exclusion Criteria:
  - <15 yrs of age
  - Current acute illness
  - Cardiovascular, neurological, and/or circulatory problems
  - Chronic pain condition (e.g., back pain)
  - Recent use of analgesic medication
  - Current use of anxiolytic and/or hypertensive medication

Experimental Procedure

- Informed Consent & Questionnaires
- Ischemic Pain Threshold/Tolerance Testing:
  - Participants completed a set of hand exercises to increase energy demand in the forearm (sensory testing).
  - Blood to the forearm was occluded by inflating a blood pressure cuff around their upper arm.
  - Pain tolerance was defined as the time (in sec.) from blood occlusion to the point at which the individual reported they could no longer tolerate the ischemic pain.
  - Pain threshold was defined as the time (in sec.) when the individual reported the ischemia pain as painful (rating = 50).
- Electric Pain Threshold/Tolerance:
  - Defined as the stimulus intensity (mA) that reliably elicits the reflex
- NFR Threshold:
  - Defined as the stimulus intensity (mA) that reliably elicits the reflex

Results: Temporal Summation of Pain & NFR

- The degree of temporal summation of pain ratings was similar in the two groups (p > .05).
- Native Americans showed reduced temporal summation of pain in the direction of lower pain sensitivity.
- Higher ischemia pain thresholds, higher electric pain thresholds, and lower suprathreshold ratings were also in the direction of lower pain sensitivity.

Conclusions

- Together, these findings suggest that Native Americans have altered pain processing, with a tendency to show hypalgesia on subjective measures of pain.
- Reduced temporal summation of NFR suggests that the hypalgesia may result from reduced hyperexcitability of spinal dorsal horn neurons, perhaps due to chronic activation of descending inhibitory processes.
- These differences in pain processing might put Native Americans at risk for future pain problems if over-activation of inhibitory processes eventually depletes this valuable resource.

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