

C. Disease Entities (Human)

C01 - Amputation Pain

(661) Is post amputation pain sympathetically maintained?

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Temperature asymmetries have specific diagnostic significance in certain disorders such as complex regional pain syndrome, but have not been sufficiently examined in amputee patients. This study quantitates regional temperature asymmetries to test the hypothesis that some part of post amputation pain (PAP) may be 'sympathetically maintained'. Infrared-Telethermography (IT) is a non-invasive technique that indirectly reflects the activity of sympathetic outflow by measuring emitted heat. Patients were acclimatized in a temperature-controlled environment for 15 minutes with clothing removed from the areas of interest. Using an IT camera, digital images were taken and then analyzed using the Thermoteknix TherMonitor® computer program. Three regions of each limb were analyzed for mean temperature: The first comparison was made with the distal region of the affected limb and comparable area of opposing unaffected limb, distal to the most proximal joint. Scar tissue was not included in the average. A second comparison was made between the area proximal to this joint and the next proximal joint, and a third made between the whole surface of both limbs. Temperature difference in the distal region in subjects with no-pain ($n=2$) = 0.95°C , with pain ($n=15$) = 1.74°C ; proximal region, no-pain = 0.35°C , with pain = 0.45°C ; whole limbs, no-pain = 0.3°C and pain = 1.08°C . All residual limbs were cooler than the contralateral side. Only two patients without reported pain have been seen, therefore meaningful comparisons could not be made. These results suggest that the distal residual limbs of PAP subjects are cooler than the unamputated side, and subjects with pain are cooler than those without. This suggests the possibility that some part of PAP may be sympathetically maintained (if one assumes that coolness is a reflection of sympathetic activity). This study is ongoing and a larger 'N' will be available at the meeting. Potential mechanisms and alternative hypothesis will be discussed.

(662) Is etiology of amputation correlated with psychophysiological and psychosocial aspects of pain?

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The present study examines the existence of subsets of amputee patients based on etiology of amputation. Intuitively, patients who undergo amputation because of chronic medical conditions (e.g. diabetes) may experience different psychophysiological sequelae and psychosocial adjustment to their amputation than patients who have amputations resulting from traumatic events. Consideration of any existing differences related to etiology would serve to enhance the study of amputation related pain by identifying factors that contribute to heterogeneity of the population. The sample ($N=14$; 9 traumatic amputation, 5 non-traumatic) was collected from individuals at the Rehabilitation Institute of Chicago responding to solicitations for research on amputation related pain. Subjects were asked to participate in a three-hour laboratory study in which they completed a health history and physical exam, psychometric questionnaires, and two electrophysiological tests on the affected and unaffected limb. Current Perception Threshold Testing (CPT) was conducted using the Neurometer® device in order to evaluate large myelinated, small myelinated and unmyelinated nerve fibers. Quantitative Sensory Testing was conducted using the Medoc® device to evaluate small fiber (thermosensory) dysfunction. Because of the small sample, measures of effect size (η^2) are reported with traditional significance testing. Patients with non-traumatic amputations tended to report more distress on the psychometric instruments (i.e., more depressive symptoms, more disability, and higher pain) but no statistically significant differences were actually observed ($\eta^2 = .02 - .09$). Patients with non-traumatic amputations also tended to be more hypoesthetic with slightly higher sensory thresholds ($\eta^2 = .03 - .13$). Taken together, these results reflect that patients with non-traumatic amputations were more impaired/ more distressed in 15/17 measures (Binomial test, $p = .002$). Although the reason for these differences could not be examined (e.g. illness burden of chronic diseases), these preliminary results tentatively support the notion that etiology of amputation contributes to heterogeneity in amputation pain.

C02 - Arthritis

(663) Links between social communication skills and physiological and psychosocial functioning in patients with RA

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Interpersonal stress has been found to be an important factor in the experience of Rheumatoid Arthritis (RA). Patients with RA report high levels of interpersonal stress, and are physiologically and psychologically reactive to interpersonal stress. Higher interpersonal stress has been associated with greater disease activity, and in turn, greater disease activity has been associated with increased pain and disability. Given the impact of interpersonal stress on RA sufferers, social communication skills related to engaging others socially (social expressivity) and communicating emotions to others (emotional expressivity) might be particularly significant to the functioning of individuals with RA. This study examined the link between these social communication skills and physiological and psychosocial functioning, including disease activity, RA pain, daily stress, psychological distress, and physical functioning. Participants were 90 individuals with RA (mean age 56.5 years, SD 10.4) participating in an ongoing study of emotional disclosure and RA pain. Measures completed by participants included the Social Skills Inventory, the Arthritis Impact Measurement Scale, and the Daily Stress Inventory. Disease activity was assessed by a rheumatologist. It was hypothesized that participants who were less skilled at social communication (i.e., reported less social and emotional expressivity) would exhibit more disease activity, and would report more RA pain, more daily stress, more psychological distress, and lower levels of physical functioning. Results of correlational analyses indicated that individuals with lower levels of social expressivity reported more disease activity and lower physical functioning. Individuals with lower levels of emotional expressivity reported more disease activity, more RA pain, more psychological distress, and lower physical functioning. One implication of these findings is that interventions designed to enhance social communication, particularly emotional expressivity, may be beneficial for individuals with RA.

(664) Pain, heart rate variability, and inflammatory indicators in women with rheumatoid arthritis

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Some studies have indicated that rheumatoid arthritis (RA) pain was associated with increased inflammation. In general, acute pain is known to increase heart rate, which decreases HRV. Studies in other populations found that inflammation and age also diminish HRV. However, these associations are not well tested in peri-postmenopausal women with RA. Nineteen peri-postmenopausal women with RA had a mean age of 61.5 ± 9.6 and 13.8 ± 11.1 years RA duration. Thirty-seven percent were minorities. This cross-sectional descriptive study included measures of sensory pain [NRS and McGill Pain Questionnaire (MPQ-Sen)], affective pain (MPQ-Aff), HRV with paced breathing (time domains of SDNN, RMSSD), and inflammatory indicators (tender joint count, morning stiffness, RA disease activity). This study was a pilot, thus statistical significance and trends are discussed. Due to the influence of age on HRV, partial correlations (controlling for age) are presented. Increased affective pain was associated with decreased HRV. Although the same pattern existed for sensory pain, the correlations were lower, leading to non-significant results. As inflammatory indicators of tender joint count, morning stiffness, and RA disease activity increased, sensory and affective pain increased, and HRV decreased. After controlling for the effects of age, affective pain influenced HRV more than sensory pain. Indicators of inflammation, such as tender joint count, morning stiffness, and RA disease activity led to enhanced sensory and affective pain, and diminished HRV. This research was partially supported by Grant Number K30-AT-00060 from NIH: NCCAM and an intramural grant from University of Virginia.