

**Stress neuropeptide levels are altered with coronary pain:
Potential implications for nursing assessment**

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Background

We aimed to address the question of whether biochemical markers could be developed to assist nurses with the assessment of pain and distress experienced by critically ill individuals who are unable to communicate. Coronary care unit patients are appropriate for the study of patient distress in critical care, since they are able to communicate and they experience a specific readily assessable stressor, coronary pain. Upon stress, stress neuropeptides are released into the systemic circulation (Pert 1997). Substance P (SP) is a neuropeptide involved in nociception, and stress perception along with neuropeptide Y (NPY) (Pacak & Palkovits 2004).

Purpose

This study aimed to explore a) alterations in plasma levels SP and NPY upon the experience and alleviation of coronary pain. b) associations between stress neuropeptide levels and pain intensity, as well as disease severity, and c) differences compared to a random sample of gender and age matched normal controls.

Method

A descriptive correlational repeated measures design was employed. A group of coronary critical care adults with pain (n=25), a group of 25 coronary patients free of pain, and a control group of healthy matched volunteers were studied. Neuropeptide levels were quantified by an immunosorbent (ELISA) assay. Pain was assessed by behavioral pain scales (Payen’s 2001-Puntillo’s 1997 pain scale) and the numeric visual analogue scale. Clinical severity was quantified by APACHE-II and the Multiple Organ Dysfunction Score (MODS).

Results

In all patients’ groups, a positive association was detected between SP and NPY levels, respectively, and VAS pain ratings ($r=0.474, 0.565, p=0.02$), and ratings at the Puntillo ($r=0,474, 0.563, p=0,010$) and the Payen scales ($r=0,562, 0.737, p<0.0001$). Significant differences were detected in SP levels in AMI patients compared to controls ($\Delta M=-199,97$ pg/ml, $p=0,04$). Significant differences in NPY levels were detected in all three patient groups compared to controls ($p<0.04$). In coronary patients NPY and SP were significantly increased in pain ($p=0.03-0.04$) versus no pain. The association of NPY levels with the pain experienced persisted even after the alleviation of coronary pain ($p=0.03$). SP and NPY levels exhibited significant inverse associations with MODS scores ($r=0.404- 0.450, p<0.03$).

Conclusions

The observation of elevated SP and NPY levels in coronary critical care patients and of associations with subjective pain perception and pain scale scores may have important clinical implications. Further study is needed to elucidate the merits and feasibility of SP and NPY measurements as biochemical markers of patient pain and distress in critical care.