The Relationship Between 5-HT Transporter Gene (SLC6A4) Polymorphisms, Electrocutoaneous Pain Sensitivity, and Pain Catastrophizing

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Introduction

Situation-Specific Catastrophizing

• Consent + Health Screening + Electrode application
• The main effect of genotype was not significant for SS catastrophizing (F[2, 60] = 3.20, p = .048, η² = .096).
• This indicates that individuals with the SS genotype displayed higher levels of situation-specific catastrophizing, relative to those with the LL genotype.

Procedure: DNA Collection

• Samples were collected from participants prior to pain testing (i.e., NFR threshold assessment)
• Buccal Swabs were used to collect cheek cells
• Epicentre Buccalamp DNA extraction kits were used to extract DNA from the cells

Results: Genotypes

- Agarose gel electrophoresis was used to determine genotypes
- SLC6A4 polymorphisms are visible in the 300-400 base pair (bp) region

Objective

The aim of this study was to examine the effects of SLC6A4 genotypic polymorphs on pain catastrophizing, depression, NFR magnitude, and pain tolerance and threshold.

Participants

• 63 Healthy Participants
  - Characteristics: 26 Men, 37 Women; White non-Hispanic (78%), single (43%), employed (59%), average yrs education = 15 yrs (SD=2.81), average age = 39 yrs (SD=14.32)
  - Exclusion Criteria:
    • < 18 years of age
    • Current acute illness, cardiovascular, neurological, and/or circulatory problems
    • Recent use of anxiolytic, antidepressant, anxiolytic, or antihypertensive medication
    • Recent psychological trauma, specific phobia of snakes or spiders
    • Any chronic pain, Raynaud’s disease

Pain Catastrophizing Scale

- 13 item self-report measure for use in clinical and non-clinical samples; used for persons with and without pain
- Items measured different facets of catastrophizing
- Internal consistency: alphas for PCS total and subscales range from .86 to .87
- Pre-test PCS Instructions: “Please indicate the degree to which you have these thoughts and feelings when you are experiencing pain.”
- Post-test PCS Instructions: “Thinking back to your experience during the electric stimuli, please indicate the degree to which you had these thoughts and feelings.”
- Items were summed to obtain a pain catastrophizing total score

Situation-Specific Catastrophizing

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• This indicates that individuals with the SS genotype displayed higher levels of situation-specific catastrophizing, relative to those with the LL genotype.

Conclusions

- Results indicated pain sensitivity was not associated with SLC6A4 polymorphisms; however, individuals with the SS genotype reported significantly higher situation-specific pain catastrophizing than persons with the LL (p<0.015) or LS (p<0.053) polymorphisms, an effect that explained 9.6% of the variance.
- Interestingly, there was no significant association found between traditionally-measured catastrophizing and genetic polymorphisms; however, it is possible that with a larger sample size, such an association may be obtained.
- SLC6A4 polymorphisms were not significantly associated with self-reported depressive symptoms in this study, suggesting the gene-catastrophizing association was not mediated by depression.