Initial PTS symptoms predict persistent pain among survivors of major thermal burn injury. Mauck M1,2, McCall MH1,2, Setton, C1,2, Jones S1,2, Hwang J1, Williams P1, Shupp J1, Karlowski R1, Smith D1, Cairms B1, McLean SA3,4

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Introduction

- Each year in the US, more than 50,000 individuals are hospitalized following major thermal burn injury (MThB)1.
- Persistent pain is a common, morbid outcome among MThB survivors.
- Increasing evidence suggests that the pathophysiology of pain following trauma relates to neuro/stress/immune mechanisms which are also involved in the pathogenesis of posttraumatic stress (PTS) symptoms.
- In this analysis, we assessed whether initial, peritraumatic PTS symptoms predict pain outcomes following MThB.
- We hypothesized that PTS symptoms in the early aftermath of MThB would predict pain, and that PTS and pain symptoms at individual follow-up timepoints would be correlated. We also hypothesized that PTS severity would be associated with decreased functional outcomes following MThB.

Methods

- Patients undergoing a tissue autograft after major thermal burn injury (MThB) at one of three burn centers were enrolled, (Figure 1).
- Tissue autograft-related pain severity (0-10 NRS) and PTS symptom severity (PSS-I) were evaluated in the immediate aftermath of MThB and at Week 6, Month 6, and Month 12.
- The relationship between PTS symptoms and tissue autograft-related outcomes was assessed during 2 distinct burn wound healing phases: the inflammatory/proliferative phase (0-6 weeks after injury) and the late proliferative/maturation phase (6 weeks – 12 months after injury).
- Linear regression and mixed modeling was performed adjusting for age, sex, and ethnicity.
- Functional outcomes were assessed with the SF-12 mental and physical health component scores.

Results

- Participant characteristics are shown in Table 1. All participants received tissue autograft for MThB (Figure 2).
- Follow-up of enrolled patients (n=96) at six weeks, six months, and one year was 91 (96%), 82 (89%), and 78 (88%), respectively.
- MThB survivors with moderate and severe PTS symptoms experience greater pain severity following MThB (Figure 1).
- After adjusting for age, sex, ethnicity, in linear mixed models initial PTS symptom severity demonstrated an association of immediate posttraumatic stress symptom severity (PSS-I) and both pain (β=0.03, p=0.003) and itch (β=0.06, p<0.0001) over time.
- Correlations between initial PTS symptoms and pain outcomes, and between PTS and pain symptoms are shown in Table 2.
- Figure 4 shows functional outcomes among MThB survivors who experience no/mild PTS symptoms versus those with moderate/severe PTS symptoms.

Conclusions

- These data support the hypothesis that PTS symptoms in the early aftermath of MThB predict persistent pain severity, and that PTS and pain MThB are associated over time.
- Initial PTS symptoms result in greater decline in mental and physical function following MThB.
- These data suggest that PTS and pain outcomes after MThB share overlapping mechanisms.
- Further studies are needed to determine the shared vs. distinct pathogenic mechanisms contributing to these outcomes.

References


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