Medical hypnosis for pain and psychological distress during burn wound debridement: a critical review

J Sliwinski*, W Fisher, A Johnson, G Elkins

Abstract

Introduction

Burn injuries are often considered to be one of the most physically and psychologically damaging experiences an individual may endure. Because of this, more treatment options for managing pain and distress during burn wound debridement are needed. When used in combination with traditional treatment, medical hypnosis may offer health-care professionals an option for meeting the needs of patients with burn wounds. This article offers a critical review of the literature currently available on the efficacy of medical hypnosis for managing pain and distress during wound debridement and offers suggestions for an improved methodology for future trials.

Materials and Methods

MEDLINE, PsycINFO, PsycARTICLES, HealthSource: Nursing Edition, PubMed and Google Scholar were searched using the keywords 'hypnosis', 'burn wounds', 'pain' and 'debridement'. Additional articles were selected from the bibliographies of representative literature. All experimental and quasi-experimental studies investigating the efficacy of hypnosis for managing pain and psychological distress during wound debridement were included in our results.

Results

Six studies involving a total of 217 participants met our inclusion criteria. The results of these studies suggest that hypnosis may be more effective than structured attention for reducing patients' pain and anxiety levels during wound debridement. However, results are inconclusive due to oversights in study design, and additional studies that correct these design flaws are needed.

Conclusion

The existing evidence suggests that medical hypnosis may be effective in managing pain and distress for burn victims who have difficulty coping during wound debridement. Further investigation is warranted.

Introduction

Burn wounds are often considered to be one of the most physically and psychologically debilitating forms of injury. Serious injuries are common in both modern and developing countries, with estimates indicating that as many as one in every 400 people are hospitalised for burn related injuries each year, with several more cases going unreported. The cause of injury tends to vary by age and gender, with children being more likely to suffer injuries resulting from domestic accidents, while men are more likely than women to experience burns resulting from work-related accidents and electrical mishaps.

In addition to being extremely painful, burn injuries also result in severe psychological distress, with patients commonly reporting feelings of bitterness, mistrust, depression, anxiety and poor body image. Previous research has indicated that a reciprocal relationship may exist between symptoms of psychological distress and burn pain. Therefore, it is imperative that victims are offered treatment options that alleviate distress in both symptom areas. However, offering patients adequate care is difficult, due to the fact that pain levels do not gradually decrease after the initial injury-causing event. Instead, dead, damaged, and infected tissue must repeatedly be removed throughout the course of treatment in a process known as wound debridement. Many patients indicate that this procedure is actually more painful than the initial injury, provoking extreme anxiety.

During wound debridement, patients are often treated with a combination of opioids and anaesthesia. However, three central limitations of this form of treatment have been noted. First, pain levels are often so intense that opioids do not offer sufficient relief. Additionally, opioids can elicit unpleasant and potentially dangerous side effects, such as respiratory depression. Finally, the necessity of frequent wound debridement limits the usefulness of anaesthesia. When these limitations are combined with the fact that neither opioids nor anaesthesia offer a long-term solution for helping patients manage psychological distress, it becomes clear that additional treatment options are needed. Hypnosis may be one such treatment option, as it has proven effective in treating the pain and psychological distress brought about by a number of uncomfortable procedures including tooth extraction, bone marrow aspirations and colonoscopy. This article offers a critical review of the literature currently available on the use of hypnosis for treating pain during debridement and offers suggestions for improving study design.

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Critical review

Materials and Methods

In an attempt to identify all experimental and quasi-experimental studies that have examined the efficacy of medical hypnosis for alleviating physical and psychological distress during wound debridement, a multiple database search was conducted using MEDLINE, PsycINFO, PsycARTICLES, HealthSource: Nursing Edition, PubMed and Google Scholar. The search encompassed all articles published through the end of September 2012. The keywords used in our search included ‘hypnosis’, ‘burn wounds’, ‘pain’ and ‘debridement’. Additional studies were taken from the bibliographies of representative literature. Studies involving hypnosis combined with another form of treatment were excluded from this review, as were studies whose samples were not limited to burn victims.

Non-randomised controlled trials

In an early study, Wakeman and Kaplan\textsuperscript{22} assigned 42 civilian and military personnel with a total burn surface area (TBSA) of 60% of their body or less (age 7–70 years, non-randomised) to either a hypnosis treatment group or a standard-care control group. Participants were further divided on the basis of age and extent of injury. A therapist trained patients receiving hypnosis until they displayed mastery of self-hypnosis, thus resulting in variable amounts of training between patients\textsuperscript{22}. Multiple induction techniques were utilised, including progressive muscle relaxation and eye-fixation. Following induction, suggestions were offered for relaxing imagery and reductions in pain, fear and anxiety. After training was complete, patients were instructed to use self-hypnosis on an as-needed basis. Patients assigned to the control condition also met with a therapist and received verbal support. Efforts were made to standardise the time spent with the therapist. In addition to meeting with a therapist, all participants received daily visits from a social worker and a chaplain. Patients were allowed to request up to 100 mg of injectable morphine each day, or its equivalent in oral medication. Percentage of permitted pain pharmacy used during hospital stay was calculated by the nursing staff and was used as the primary outcome measure.

Results indicated that control participants with burns covering less than 30% of their body requested significantly more medication than participants assigned to the treatment condition ($p < 0.01$)\textsuperscript{22}. The same was true for patients with burns covering more than 30% of their body ($p < 0.01$). Strengths of this study include attempts to standardise the amount of time patients spent with the therapist as well as the utilisation of a behavioural outcome measure. However, key limitations of this study include a failure to standardise the amount of hypnosis training patients received, and the use of multiple induction techniques\textsuperscript{22}.

Randomised controlled trials

In the first randomised controlled trial to investigate the use of hypnosis for treating burn victims, Patterson et al.\textsuperscript{23} randomised 30 hospitalised burn patients (ages 18–60 years) to a hypnosis intervention ($n = 10$), an attention and information control group ($n = 10$) or a delayed treatment control group ($n = 10$). Average TBSA was 16% at pre-screening, with all patients rating their pain as a five or higher on a 10-point scale. Baseline data were collected on Day 1 of the study. Self-reported pain was recorded on a 10-cm visual analogue scale (VAS). These measures were completed within 3 h of wound debridement\textsuperscript{23}. On Day 2 of the study, participants assigned to the hypnosis condition received one, 25-min hypnosis session, which was delivered by the burn unit psychologist. Sessions began by asking the patient to imagine him or herself at the top of a staircase with 20 steps. As patients descended the staircase, they were offered suggestions for increased comfort and relaxation. At the end of the intervention, patients were given suggestions for confusion and amnesia. A post-hypnotic suggestion instructed patients to re-enter the hypnotic state during wound debridement. Patients assigned to the attention and information condition were asked to report on the origin of their injury, as well as the emotional toll the experience had taken on them\textsuperscript{23}. These patients also received information on the nature of their pain and were asked to differentiate pain during debridement from pain that might indicate further injury. Finally, these patients were told that they were receiving hypnosis, and were asked to count to 20 with their eyes closed while imagining a relaxing place. They were given instructions to repeat this process prior to their next debridement when prompted by a touch on the shoulder by a nurse.
Results indicated that patients in the hypnosis condition reported significantly less pain on Day 2 than on Day 1 ($p < 0.01$, $d = 1.59$, mean difference (MD) = 3.8). No significant differences were seen between baseline and Day 2 scores for participants in the control conditions. Day 2 scores for participants in the hypnosis condition were also significantly lower than Day 2 scores for participants in the attention and information control condition ($p = 0.03$, $d = 0.83$, MD = 2.1) and the delayed treatment condition ($p = 0.01$, $d = 2.64$, MD = 2.4). Significant differences between baseline and Day 2 data were not seen for participants in the two control groups. Key strengths of this study include the use of both an active and passive control group, blinding of health-care professionals to condition, the standardisation of the hypnosis intervention, the amount of time patients spent with a therapist, medication usage and expectations for receiving hypnosis. However, a limitation is the failure to standardise the time between wound debridement and the collection of post-intervention data. Patients and observers were allowed to rate post-intervention pain from immediately after debridement to up to 3 h later. Finally, although sample size may have been appropriate for a pilot study, larger samples are needed to increase confidence in generalising findings.

In a follow-up to the previous study, 61 adult patients with burn wounds were randomised to a hypnosis intervention or an attention and instruction control group. Average TBSA was 13.95%. Protocol was nearly identical to the previous study, however, baseline and post-intervention data were collected over four consecutive days. Maximum pain scores on Days 1 and 2 were averaged to create a baseline assessment of pain. The intervention was then delivered on the morning of Day 3 with average maximum pain scores during debridement on Days 3 and 4 serving as the outcome measure. Additionally, pain levels were reported within 1 h of debridement as opposed to 3 h. Finally, patients who reported low levels of initial pain were not prohibited from serving as participants. This step was taken to assess whether differences in initial pain levels may explain the discrepancies in the reported efficacy of hypnosis for the treatment of burn pain within the literature.

Results indicated that no significant between-group differences in self-reported pain emerged when all participants were included in the analysis. However, when analysis was restricted to patients with baseline pain ratings above the midpoint on a 100-mm VAS, significant differences between participants in the hypnosis ($n = 15$) and control condition ($n = 23$) were reported ($p < 0.05$, $d = 0.80$, MD = 15.43). Significant between-group differences also emerged when nurse ratings were examined for the entirety of participants in the sample ($p < 0.05$, MD = 11.03). However, this pattern was not repeated when only patients with high initial pain scores were included in the analysis. The self-report data from this study suggest that patients with higher baseline pain levels receive more benefit from hypnosis than patients with less severe pain.

In a third randomised controlled trial, 44 hospitalised Iranian women (age 16–75 years) were assigned to receive either four consecutive daily sessions of hypnotherapy ($n = 22$) or standard-care ($n = 22$). Patients receiving hypnosis had a TBSA of 30.2% on average, whereas patients in the control group had an average TBSA of 27.1%. Baseline data indicated that patients assigned to the control condition were more likely to have second- and third-degree burns than patients receiving hypnosis. The hypnosis intervention followed the rapid induction amnesia and analgesia (RIA) protocol used in the previous two studies, with the addition of simplified direct suggestions for amnesia and analgesia.

Results indicated that participants receiving hypnotherapy reported significantly less post-procedural pain on a 100-mm VAS scale than controls ($p < 0.01$, $d = 2.84$, MD = 30.9). Participants receiving hypnotherapy also reported significantly less procedural anxiety ($p < 0.01$, $d = 1.62$, MD = 40.2). These results offer support for the efficacy of clinical hypnosis in the treatment of burn-related pain and anxiety. Strengths of this study include standardisation of hypnotic technique, the use of valid self-report measures for pain and anxiety, and an adequately powered sample size. Limitations of this study include that analyses of within-group comparisons from baseline to post-intervention were not reported. Also, although hypnotisability scores were recorded for participants in the intervention condition, the researchers failed to assess whether or not outcomes were mediated by hypnotisability. This limits the determination of whether hypnosis, and not non-specific factors, account for the change in pain ratings.

Finally, in the most recently conducted randomised controlled trial, 46 adult patients with burn wounds were randomised to either a hypnotic intervention ($n = 27$) or an attention and relaxation control group ($n = 19$). Participants had a mean TBSA of 15% and spent an average of 18 days in the hospital. The hypnosis intervention followed the RIA protocol outlined in previous studies. Participants in the control condition were asked to provide information on the origin of their burn injury and were provided with information related to their procedure as well as an audiorelaxation of relaxing music to play during debridement. Nurses and data collectors were kept blind to the treatment condition.
Post-procedure total scores on the short form of the McGill Pain Questionnaire\textsuperscript{25} revealed significantly greater reductions in pain for the hypnosis group compared with the attention-only placebo group. However, groups did not differ when pain was assessed with other measures, leading the authors to conclude that hypnosis probably affects multiple pain domains\textsuperscript{18}. Therefore, measures that assess these multiple domains may be more sensitive to the effects of hypnotic analgesia. Patient hypnotisability was not found to significantly correlate with treatment outcome. This study has several strengths including random assignment, blinding of participants and medical professionals to condition, the application of a standardised hypnotic script and the use of multiple measures to assess pain. A limitation of this study includes the lack of a standard care control group, which may allow for greater clarity in determining the percentage of improvement that may have been attributable to placebo. However, despite these limitations, this study represents the most well-designed research protocol put forth thus far.

**Uncontrolled case series**

One uncontrolled case series study examined the effect of hypnosis in combination with virtual reality (VR). In this study, VR hypnosis was examined for the relief of burn pain in a sample of 13 patients (mean age = 38 years, 92\% Caucasian, 92\% male)\textsuperscript{26}. Average TBSA was 17\%, and patients had an average hospital stay of 24 days. Mean hypnotisability score was 2.57 on the Stanford Hypnotic Clinical Scale\textsuperscript{27}. During the intervention, patients wore a Kaiser ProView XL50 VR helmet and a Polhemus-Fasttrak head-tracking device. The VR environment placed participants at the top of a snowy canyon. Once placed in the virtual reality environment, participants received 4 min of audio taped hypnotic instructions, followed by suggestions for deep relaxation that were accompanied by the experience of floating down the canyon as numbers passed by. Once at the bottom of the canyon, participants were asked to close their eyes and imagine themselves in a welcoming environment. Suggestions were offered for numbness, time distortion and dissociation. A post-hypnotic suggestion was offered for re-experiencing these suggestions during debridement. Baseline data were collected on Day 1 of the study and included assessment of pain, burn-specific pain anxiety and use of opioids. The intervention was delivered on the morning of Day 2, with post-intervention data collected later that day and on Day 3 immediately following wound debridement.

Results indicated that although all patients reported satisfaction with treatment, five participants were dropped from the study prior to data collection on Day 3, due to changes in burn-management plans, surgical plans or pre-procedure nausea\textsuperscript{26}. Day 3 data for the remaining participants indicated an 11.8\% drop in pain unpleasantness scores, a 19.6\% drop in reports of patient’s worst wound-care pain and a 28.4\% reduction in the time spent by the patients thinking about their pain. Anxiety scores decreased by 26.1\%, and there was a 50\% drop from baseline to Day 3 in the amount of opiates participants were given before, during and after their wound-care procedure. Statistical analyses suggested that the correlation between hypnotisability and pain was not significant. These results suggest that VR hypnosis may help patients cope with anxiety and pain accompanying wound debridement. The strength of this study is the use of a standardised intervention, which will facilitate replication. Large-scale randomised controlled studies are needed to further assess the effectiveness of this treatment method.

**Conclusion**

The existing literature, though limited, provides persuasive evidence that hypnosis may be effective at reducing patient pain and distress during wound debridement. This is encouraging considering the drawbacks of currently utilised treatments. Future research endeavours should include larger sample sizes and appropriate randomisation techniques. It is also recommended that researchers utilise multiple measures when assessing pain, as previous research has indicated that certain assessments may be more adept at detecting improvements specifically related to pain during wound debridement. The utilisation of a hypnotic script would also allow for greater comparison between studies and easier replication. Furthermore, several of the studies reviewed in this section utilised a brief intervention, some as short as one session. Future efforts should examine whether or not increasing the number of hypnotic sessions offered enhances efficacy. Finally, although the above-mentioned studies assessed improvements in patient pain levels following hypnosis, none of the studies included in our review attempted to assess the variety of psychological distress symptoms commonly reported by burn victims. Considering the reciprocal relationship between pain and psychological distress, future studies should incorporate suggestions for improvement in these areas into hypnotic scripts, and attempts should be made to adequately assess symptom improvement. Incorporating these suggestions into future research endeavours will add further clarity to the question of whether hypnosis is an effective treatment option for burn victims who have trouble managing their feelings of physical and psychological discomfort during wound debridement.

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Abbreviations list
MD, mean difference; RIA, rapid induction analgesia; TBSA, total burn surface area; VAS, visual analogue scale; VR, virtual reality.

References