



Editorial comment

Relief of phantom limb pain using mirror therapy: A bit more optimism from retrospective analysis of two studies

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In this issue of the Scandinavian Journal of Pain, Griffin and colleagues [1] have presented a rather unique analysis of data from two previous studies on mirror therapy for the treatment of phantom limb pain (PLP) of the lower extremity after amputation. One of the previous studies has been published [2], the other has been submitted for publication. The primary outcome of the Griffin et al. study was to assess the time to response and if the treatment response time was different with different levels of baseline pain.

1. Mirror therapy takes longer, up to 21 sessions, to work in patients with severe phantom pain

Indeed, those with less severe pain had a more rapid response, which was sustained over the course of treatment. The treatment paradigm consisted of five sessions (15 min long) per week for four weeks. Those amputees with the highest pain levels (VAS 6–10) had a slower response, not seen until the 21st session and, as with those in the other two groups, this effect persisted until therapy was completed at four weeks. These findings are important since many trials of mirror therapy are quite short and both patient and therapist may be discouraged with the lack of effect during a short course but had they persisted, perhaps there would have been a better outcome as seen here.

2. Throbbing, shooting, sharp, and tender pain components are relieved best by mirror therapy

A secondary outcome was to analyze which pain descriptors from the McGill Pain Questionnaire were improved in response to mirror therapy. Several showed a marked improvement, even with such a small cohort of subjects. Those with the strongest improvement were “throbbing”, “shooting”, “sharp” and “tender”

($p = \leq .0004$) and these symptoms could function as predictors of a positive response to mirror therapy in the clinical setting.

3. Multiple varieties of protocols for mirror-therapy

Mirror therapy, although suggested by Ramachandran et al. in 1999 [3] for the treatment of PLP, has been poorly studied overall and the results have been variable [4]. For PLP, the poor results are possibly due to (1) the timing of the institution of the therapy, (2) the cause for amputation, (3) the age of the patients, (4) the severity of the baseline pain and (5) inconsistencies in treatment protocols.

4. Most therapies for phantom pain lack sufficient evidence of effect

Pharmacotherapy has been discouraging and a critique of the literature is available in the latest Cochrane Database Systemic Review [5]. The problem is with no evidence for effect for most medications for neuropathic pain and only short-term effects shown for analgesics. The studies are difficult to interpret because of small sample size and short follow up. It is evident that there is a need for other forms of therapy and mirror therapy has become popular. A recent review on mirror therapy for PLP is also discouraging and states “We cannot recommend MT as a first intention treatment for PLP. The level of evidence is insufficient” [4]. Again, poor studies are cited.

5. Mirror therapy may help and has no adverse effects: try it early and keep at it

However, the data in this study by Griffin et al. allows a bit more optimism. The two studies that their data are extracted from show a very high response rate with a minimal intervention for each session but with a rather long treatment period. In the first study, the response rate was well over 90%, a remarkable result [2]. The combined high rate of response – 87% – perhaps is due to this being an early intervention since most subjects entered the study at about one month after amputation. Early treatment presents two possible confounding variables. One is that there is often an early

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improvement in PLP [6] in most epidemiological studies but then an increase again after about a year [7]. In this present study data, over 50% of the participants were treated in the first two months after amputation and the end of the study period in the published study was just 8 weeks later. This would mean that treatment was during the early improvement phase of PLP and would miss the later rebound if the studies showing this time course are correct. Therefore, a part of the improvement could be due to the natural history of PLP. It is interesting to speculate that in some way, the cortical reorganization seen during the evolution of PLP could be altered to change the course of this process [8]. If this is so, early intervention with mirror therapy would be very important for the best outcome.

6. The younger patients have less phantom-pain after traumatic amputation

The age of the subjects might also influence the outcome and the majority were young individuals. Data on older individuals shows that the prevalence of PLP can be as high as 80% [9]. Data from children and teenagers show that this group has a much lower prevalence/incidence of PLP but there is no good data on stratification of the prevalence/incidence of PLP by age [10].

7. Will optimal perioperative pain management reduce risk of phantom pain?

There is also data that correlates the severity of PLP to pre-amputation pain and post-operative pain [11]. The once hopeful reports that perioperative epidural analgesia reduced stump and phantom pain, were not confirmed by Nikolajsen et al. [12], although in that study the control group also had prolonged epidural analgesia after amputation. We have no information concerning the pain state of the individuals in this study by Griffin et al. either pre- or post-operatively and if they had very good pain control in the perioperative period, this might be a factor in explaining the high success rate of the mirror therapy since one would expect a more rapid improvement in PLP based on good perioperative pain control.

8. “Irritable” pain phenotypes may be better pain candidates for mirror-therapy?

This study brings up another point worth emphasizing [1]. In pain research, there is a new emphasis on focusing on pain phenotypes for research and therapy rather than diagnoses. This has been proposed formally by the IMMPACT group [13]. The evidence in this study offers an opportunity to select a phenotype for further research in mirror therapy, i.e. young, recent amputees with pain symptoms of “throbbing”, “shooting”, “sharp” and “tender” using the simple protocol from the two studies reanalyzed here.

9. There is much to be done!

There certainly is much to be done before we understand phantom limb pain. We lack consistent research in large populations on the demography of PLP. We lack consistency in protocols using mirror therapy for PLP and the protocols are many. We lack information on different phenotypes in the PLP population. There are perhaps a few bright spots in this picture, however. A study protocol addressing some of these issues has been proposed and will be used in the future [14]. There is hope that sufficient subjects can be recruited to make this a significant step forward. There has also been a DELPHI consensus meeting [15] that reviews the various treatment options and also presents a panel opinion on various

aspects of mirror therapy that should be considered in research and treatment paradigms. The two studies that provided data for this article are promising since the response rate was so high. Both had control data similar to a placebo treatment that improved the quality of the studies. The small numbers of subjects in the studies is a weakness, however, that may be a source of bias seen in most of the published studies on PLP.

The present study by Griffin et al. published here adds important data on treatment trajectory and associated symptoms involved in the symptom improvement with mirror therapy for PLP that expands the present knowledge of this difficult problem [1].

10. Mirror therapy also for Complex Regional Pain Syndrome (CRPS)?

CRPS is another enigmatic pain condition that is difficult to treat. Pain modulator systems and limb representation appear to be disturbed in the CNS of patients with longstanding CRPS, and similar to phantom limb pain, CRPS has been miraculously improved with mirror therapy [16].

Conflict of interest

None declared.

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