

Advanced soft tissue release® (astr®) long- and short-term treatment results for patients with neck pain

Abstract

Objectives: This study investigates ASTR's short- and long-term effectiveness in reducing pain from soft tissue-related neck injuries. ASTR is a holistic specialty that evaluates and treats soft tissue dysfunctions. This is a cross-sectional study of all patients who came to one Physical Therapy clinic for neck pain between 03/2013 and 04/2015.

Methods: Age, gender, previous treatments, type of symptoms, length of symptoms, visual analog scale (VAS) prior to ASTR treatments and after final ASTR treatment, and number of sessions for pain relief and complete pain relief were collected from patient charts. Patients were followed-up with about a year after treatment for VAS rating on their neck pain. Data was analyzed to determine the long- and short-term efficacy of ASTR treatments for neck pain.

Results: The average VAS reported before treatment was 7.51, at the last treatment was 0.31, and when patients were followed-up with a year later was 0.49. Eighty-three percent of patients experienced pain relief after their first ASTR treatment. Eighty-four percent of patients had no pain by their final treatment. 87% of patients were pain free at the time of follow up.

Discussion: ASTR relieved neck pain in both short- and long-term periods. Neck pain was reduced to a low VAS rating during the first three ASTR treatments and that low VAS rating lasted to the end of treatment and through the follow-up period.

Volume 5 Issue 4 - 2016

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Received: August 12, 2016 | **Published:** September 01, 2016

Introduction

Factors contributing to the high prevalence of neck pain surround the modern lifestyle where many spend hours habitually sitting in constrained, poor postures while working on a computer, watching television, or driving in a car.¹ A 2013 report by the U.S. Department of Health and Human services reveals that between 14% and 15% of American adults are experiencing neck pains at a given time.²

Commonly sought methods of relieving neck pain include spinal manipulation, acupuncture, massage therapy, and exercise-based physical therapy, but these can be ineffective or their relief can be short-lived. A 2006 systematic review of 16 reviews performed by Ernst and Canter analyzed the use of spinal manipulation, a common chiropractic technique, to treat neck pain, and they concluded that spinal manipulation was not an effective intervention for this ailment.³ A 2010 systematic review of 265 randomized controlled trails (RCTs) and 5 non-RCTs for the Agency of Healthcare Research and Quality (AHRQ) found spinal manipulation to be better than placebo or no treatment in decreasing pain immediately or short-term, and when manipulation was compared to massage, medication, or physical therapy, the results inconsistently either favored manipulation or indicated no significant difference between the two treatments. In this same review, acupuncture results were shown to be no different than placebo in post-treatment disability, pain medication intake, or global improvements in pain, and there was no difference between acupuncture and sham-acupuncture in reducing chronic neck pain.⁴

Massage therapy is one of the oldest therapeutic tools for relieving pain, but a 2015 systematic review of 26 randomized trials published in the Australian Journal of Physiotherapy found no evidence to show that massage therapy reduces neck pain.⁵ The 2010 systematic review

for the AHRQ concluded that massage was better than no treatment, placebo, or exercise for reducing neck pain and disability, but it didn't help with neck flexibility. Additionally, evidence indicated that the overall cost of massage therapy was much more than those of general practitioner care. Another 2014 systematic review of 27 randomized controlled trials comparing single therapeutic exercise for mechanical neck disorders stated that there was no high quality evidence to indicate effectiveness of exercises for neck pain.⁶ Additionally, this review also specified that one should not expect improvement of neck pain if only stretching exercises are done.

Advanced Soft Tissue Release, abbreviated ASTR, is a patented specialty that holistically evaluates and treats a majority of the elements of a soft tissue injury.⁶ The main component of ASTR is a manual therapy method, comprised of over 125 unique maneuvers, that addresses soft tissue dysfunctions including fibrosis (scar tissue), myofascial pain, trigger points, and muscle spasms. Several patented tools are part of ASTR's manual therapy component, and they are specifically designed to release fascia restriction and remove soft tissue fibrosis (scar tissue). The other parts of ASTR are patient education materials, exercise programs, and discharge plans all assembled into protocols for the most common soft tissue dysfunctions. Together these, with the manual therapy elements, address six factors of soft tissue injury: scar tissue, fascia restriction, trigger points, muscle spasms, mind set, and habits. Soft tissue dysfunctions including fibrosis, myofascial pain, trigger points, and muscle spasms may play a critical role in neck pain. ASTR's method of directly addressing these through manual therapy in combination with specific exercises, habit modifications, neuromuscular reeducation may be an effective way to decrease pain in the short- and long-term. The authors are not aware of any studies of methods like the ASTR specialty.

This study analyzes the short and long term efficacy of the Advanced Soft Tissue Release approach for patients with neck pain. The hypotheses are that ASTR treatments reduce patients' neck pain in both the short term and long term. These hypotheses are compared against the null hypotheses that ASTR treatments do not result in short or long term pain relief of neck pain. This study also presents statistical information corresponding to the average number ASTR treatments for patients with neck pain.

Methods

Participants

All participants of this study were patients who sought treatment from one Physical Therapy clinic between March 2013 and April 2015. This was inclusive of all the patients with neck pain who met the criteria, not a randomized sample. All participants signed consent forms, and the parents/guardians of the two included minors signed consent forms, allowing the Physical Therapy clinic to include their non-identifying information in the research.

Patients included in this study had soft tissue related neck pain such as myofascial pain syndrome or pain related to trigger points, fibrosis (scar tissue), and/or muscle spasms and were treated with the ASTR specialty. Neck pain diagnosis was determined based on pain in the neck area, decrease neck active range of motion, and presence of neck soft tissue dysfunction such as fascia restrictions, trigger points, scar tissue and muscle spasm. Assessment for these soft tissue dysfunctions was performed using hand palpation and tools to screen for the presence of scar tissue, trigger points, and muscle spasms. Patients included did not receive manual therapy for their condition elsewhere. Exclusion criteria for this study was: pregnancy, cancer, severe structural deformity in the neck (arthritis, muscular dystrophy disease, bone fracture, severe scoliosis), neck pain from recent motor vehicle accident, stroke, cerebral palsy, multiple sclerosis, spinal stenosis, Parkinson's disease, or recent orthopedic surgery. Patients with severe comorbidities were excluded because, in some, the pain was caused by the structural deformity unrelated to soft tissue dysfunction (ASTR treats soft tissue dysfunction, not structural deformity) and, in others; the neck pain was a secondary issue to a primary disease. Patients who had received other treatments including ultrasound, pulsed electromagnetic therapy, electric stimulation, laser, massage, chiropractic, other physical therapy, and acupuncture were also excluded from this study to eliminate those confounding variables as possible explanations for patients' pain relief.

Overall, 105 patients were included in this study. The total number of neck patients that came to the clinic between March 2013 and April 2015 was 149; 32 patients did not meet the inclusion criteria and 12 patients discontinued ASTR treatment prior to completing ASTR program. Complete data was obtained for all patients, except that only 45% of the patients were able to be contacted for follow-up. Fewtrell et al.⁷ found that when completing a long term follow-up loss is inevitable, "even with the best study design and conduct."⁷ Due to the fact that this was a retrospective cohort study, with a 1-2 year follow up being clinical protocol for all patient charts, data was collected by reviewing charts without controlling exactly how long from discharge follow up was taken.

Study design and protocol

This research was obtained as a retrospective cohort study of patients who sought treatment at a Physical Therapy clinic for neck pain between March 2013 and April 2015. This study is an observational study. This study received exemption from the IRB

committee from the overseeing Physical Therapy Clinic because the data used already existed in patients' charts that signed informed consent forms to participate in the study. Additionally, the pain levels after discharge were obtained through the clinic's normal customer service protocol of periodically following up with patients after discharge. Data was collected from patient charts including: age, gender, previous treatments, type of symptoms, length of symptoms, visual analog scale (VAS) for pain prior to ASTR treatments and after final ASTR treatment, number of sessions to notice some pain relief, number of sessions to notice complete pain relief, total number of ASTR treatments and follow-up pain level (VAS).

Outcome measures

There are two primary outcomes and one secondary outcome considered in this study. The first primary outcome is representative of short term effects of ASTR treatment on neck pain, and it is the change in pain from the initial VAS measure before ASTR treatment and the VAS measure of pain at the time of discharge. The second primary outcome is indicative of long term effects of ASTR treatment on neck pain, and it is the change in pain from before the first ASTR treatment to a couple months after the last ASTR treatment. The secondary outcome of this study is a quantification of the number of ASTR treatments required to relieve neck pain.

Validity/reliability

The results of this study, indicating the long and short term effects of ASTR on patients with neck pain, can be generalized to people with soft tissue related neck pain not related to structural deformity or recent orthopedic surgery (see inclusion/exclusion criteria) who receive ASTR treatment. The Visual Analog Scale (VAS) is a valid and reliable measure of pain intensity for chronic and acute pain.^{8,9} The reliability of this study lies in the notion that all ASTR treatments were performed by a single physical therapist, and all the patients received the same performance, protocol, and tools for treatment of neck pain. Data from patient charts was accumulated by 2 assistants, and follow up data was collected via email and phone calls by the assistants.

Interventions

The interventions performed are the proprietary protocol and methodology of the patented Advanced Soft Tissue Release (ASTR), a specialty that evaluates and treats soft tissue dysfunctions affecting musculoskeletal and neuromuscular systems. The approach holistically addresses scar tissue, fascia restriction, trigger points, muscle spasms, mind, habits, and nutrition through the use of over 125 unique manual therapy maneuvers, ASTR tools, patient education materials, and specific exercise protocols.

Statistical analysis

95% confidence intervals were calculated for the primary outcome variables, as well as some other numeric variables and proportions. All calculations were done using the statistical software package R (www.r-project.org).

Role of funding source

This research was funded by Reliant Physical Therapy, APC.

Results

A total of 105 patients were included in this study, 23 male and 82 female, averaging 47 years of age but spanning between 13 and 91 years old. The most common description of neck pain was "dull/achy"

by 18% of patients. After one ASTR treatment, 83% of patients first experienced pain relief, and 97% of patients felt relief within the first two ASTR treatments (Table 1).

Table 1 Statistics of the primary variables

Variable	Mean	SD	Margin of Error
VAS prior to treatment	7.51	1.71	7.18 to 7.84
VAS at first relief	0.62	0.96	0.43 to 0.81
VAS at final treatment	0.31	0.89	0.14 to 0.47
VAS at follow-up	0.49	1.41	0.07 to 0.90
Number of ASTR treatments	4.36	3.36	3.71 to 5.01
Number of non- manual therapy ASTR treatments	2.22	3.68	1.51 to 2.93
Time until follow-up	12.20 mo.	17.28 mo.	7.13 to 17.29

Of the 105 patients, 44 (42%) had previous treatments. The distribution of the VAS scores at the end of the ASTR treatment for these 44 patients is given in Table 2. The two patients who ended with 2 began with a 10 and an 8. Therefore, they experienced a dramatic relief, despite not achieving VAS=0. The one who ended with a 6 started with a 10. She was 73 years old with throbbing neck pain that increased with any motion for 15 years. She had previously tried a chiropractor, massage, physical therapy, and acupuncture (Table 2).

Table 2 Distribution of VAS scores at the final ASTR treatment

VAS at final treatment	0	1	2	6
Number of patients	37	4	2	1

Some of the relevant graphs are as follows. Figure 1 shows that the symptoms of the majority of patients began within the past year, although nine patients had their symptoms for twenty years or more. Figure 2 shows that the VAS scores prior to the first ASTR treatment were from 4 to 10, with the most frequent at level 8. Figure 3 displays the overall effectiveness of the ASTR method. The graph shows the difference between the VAS scores before the first treatment and the VAS scores at the follow-up, which is a look at the overall effectiveness of ASTR (Figures 1-3).

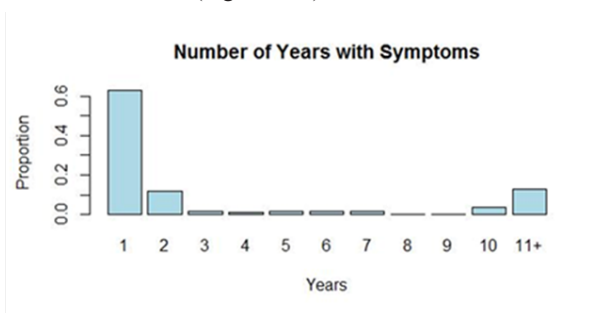


Figure 1 Duration of symptoms before first ASTR treatment.

Moving to inference, the effectiveness of ASTR is shown in Figure 4. The 95% confidence interval for the mean initial VAS is 7.18 to 7.84. By contrast, by the last treatment, the mean VAS drops within 0.14 to 0.47, at the 95% confidence level. These are the two primary outcome variables. In fact, the mean VAS reached a low level within the first three treatments and remained low through follow-up (Figure 4).

Of the 44 patients who had received alternative treatments before coming for ASTR, 37 (84.1%) reached a VAS score of 0 by the final treatment. This implies that somewhere between 69.3 and 92.8% of the population of all such patients should be able to achieve the same results. Of the total 105 patients, 89 (84.8%) reached a VAS score of 0 by the final treatment. This implies that 76.1 to 90.8% of the

population of all such patients should be able to achieve the same results. Of the 47 patients who were able to be reached for follow-up, 41 (87.2%) had a VAS score of 0. This implies that 73.5 to 94.7% of the population of all such patients should be able to achieve the same results.

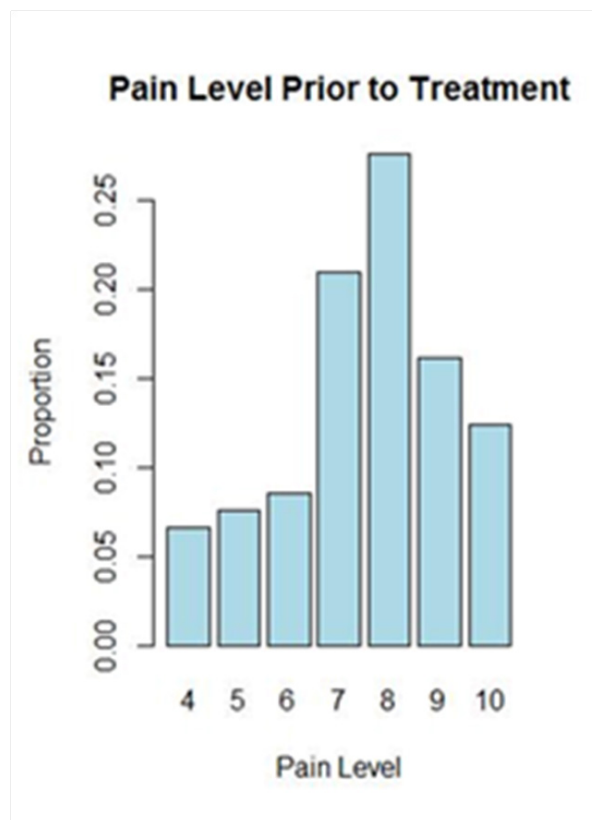


Figure 2 VAS score before first ASTR treatment.

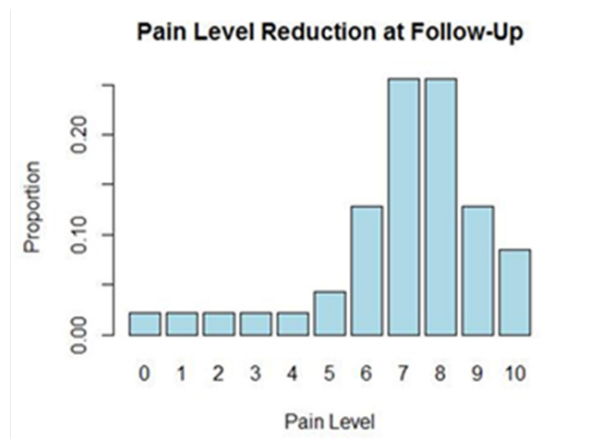


Figure 3 Difference between initial VAS score and VAS score at time of follow-up. Larger numbers represent the best results; smaller numbers represent the least results.

Moving beyond the primary and secondary outcome results, we explored the relationship between the initial VAS score and the projected effectiveness of ASTR. Looking at Figure 5 displays the number of treatments until the first relief occurred along with their initial VAS scores. It can be seen that all patients experienced relief within three treatments and there is no major relationship between the initial VAS score and the length until relief. Figure 6 shows that there is no prominent correlation between initial VAS score and the total number of treatments needed. Indeed, there is a full range of initial

VAS scores for each treatment length and the median VAS score for each treatment length is in the same 6-8 range (Figures 5 & 6).

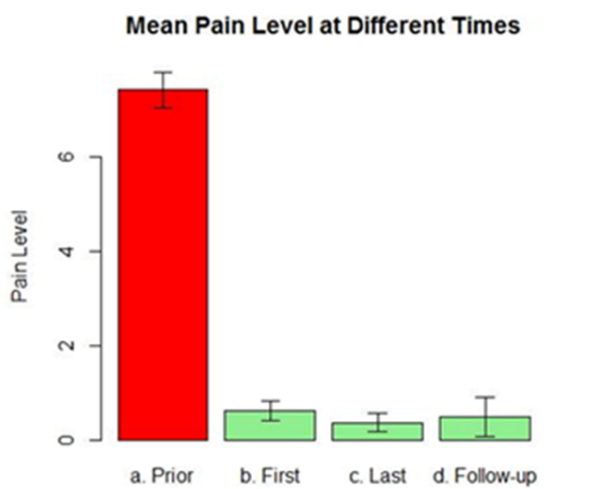


Figure 4 95% Confidence intervals for VAS scores at four time points: (a) Prior to first ASTR treatment (7.18, 7.84), (b) at the conclusion of the first ASTR treatment where relief was obtained (0.43,0.81), (c) at the conclusion of the last treatment or consultation (0.14,0.47), (d) at telephone follow-up (0.07,0.90).

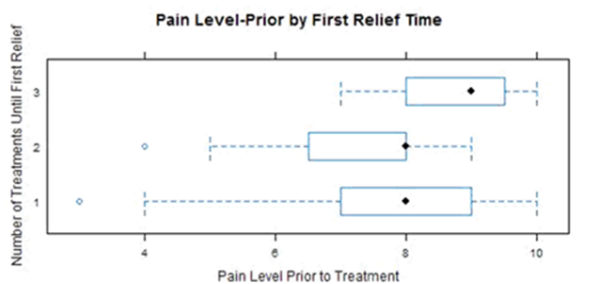


Figure 5 Initial VAS score plotted in groups according to the number of treatments until relief was obtained. All patients experienced a reduction in VAS score by the third treatment. In the standard box plots shown above, the dotted line at left is the bottom 25% of the data, the box is the middle 50% of the data, and the dotted line at right is the top 25% of the data. The black dot is the median and the circles at far left are outliers.

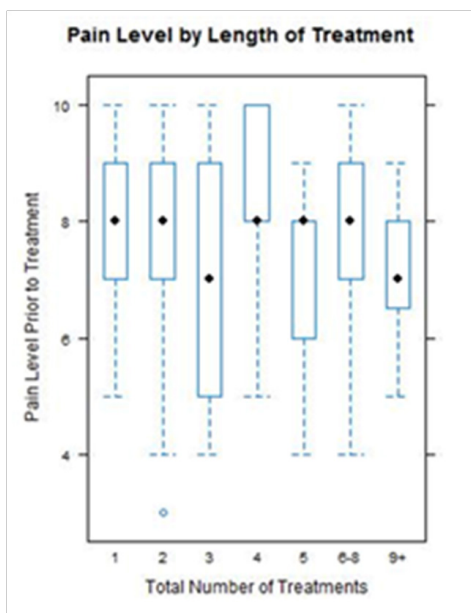


Figure 6 Initial VAS score plotted by the total number of ASTR treatments.

Discussion

This study shows ASTR’s effectiveness for quick, long lasting relief from neck pain. Most patients experienced pain reduction in the first treatment session that persisted through the length of the treatment and to the time of follow up. By the third treatment session, all patients had experienced some pain relief. Eighty-five percent of patients had complete relief of their neck pain after their last ASTR treatment and 87% of patients had no neck pain at the time of follow-up which was, on average, a year later. To obtain these long lasting results, patients had, on average, 4.3 ASTR treatment sessions (including manual therapy) and 2.2 (non-manual therapy) sessions.

ASTR’s success in treating neck pain may likely be due to its emphasis on myriad factors of an injury. Unlike many other treatment methods, ASTR uniquely addresses soft tissue dysfunctions such as fibrosis and fascia restriction. With neck pain especially, there is commonly a cycle of factors such as prolonged poor posture increasing scar tissue formation increasing pain. ASTR may be so effective because it addresses both the habits (poor posture) and soft tissue dysfunction (scar tissue) causing the pain. This stops the cycle. Further research will need to be done on how much the manual therapy and non-manual (patient education, exercise protocols, nutrition, and mindset) aspects of ASTR contribute to its success in treating neck pain. It is also recommended that future studies be performed utilizing randomized control trials.

It should be noted that all confidence intervals in this paper are based on the assumption that the patients treated represent a random sample from the population of all potential patients of ASTR. This is not, strictly speaking, the case since random sampling was not conducted, but rather the standard practice of including all patients was used. While it is conceivable that there could be geographic, demographic, socioeconomic, or other effects, we do not think they would substantially alter our conclusions. Our point from these confidence intervals is not to make a claim about the real boundaries of unknown population parameters, but only to provide evidence that the ASTR results are strong and estimated with precision.

ASTR could drastically change the way physical therapy is done. Its holistic approach and focus on soft tissue dysfunction may be revolutionary for effectively treating physical pains and/or injuries, not only limited to neck pain.

Conclusion

The Advanced Soft Tissue Release specialty demonstrated a high success rate in treating patients with neck pain. All patients felt relief within the first three ASTR treatments. Eighty-five percent of patients no longer had neck pain at the end of their treatments, and 87% of patients were free of neck pain when followed-up with about a year later. These results were obtained after an average of 6.5 total ASTR treatments. This study presents strong evidence that ASTR successfully relieves neck pain for short and long terms, and this relief happens quickly, over the course of only a few treatment sessions.

Contributors

Jaime Page engaged in collecting the data from patients’ charts.

Acknowledgments

None.

Conflicts of interest

None.

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