



Comparative Meta-Analysis on Efficacy of Massage and Other Evidence Based Regimens for the Management of Neck Pain

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ABSTRACT

While there is much debate on how to treat neck pain either acute or chronic, the prevalence of it is increasing day by day. Various treatment modalities are being tried/used these days to counter this challenging situation. Allopathic drug therapies, other non invasive techniques, invasion and surgical procedures and a long list of analgesic, anti-depressant, anti-inflammatory and muscle relaxant drugs are being prescribed despite of there limited response. Because of the limited and slow response to allopathic medicine, mass are turning to alternative therapies. Research into the mechanisms, side effect profiles, and efficacies of these, alternative therapies has increased in recent years; much more still remains unknown and untested. Herein, we review the literature on allopathic as well as complementary and alternative medicine for pain, with particular emphasis on evidence-based assessments pertinent to the most common alternative therapies, including acupuncture, herbal therapy, massage therapy, hypnosis, tai chi and biofeedback etc.

Keywords: Cervical Pain; *Dalk*; Therapeutic Massage; Herbal therapy; *Unani*.

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INTRODUCTION

There are various therapeutic modalities; including physical modalities, thermal modalities, electrical modalities, exercise therapy, behavioural therapy, education and laser therapy that are making claim of managing neck pain. Of these, exercise, mobilization and manipulation have the greatest support in the literature, whereas thermal treatments (including therapeutic ultrasound) and electrical therapies (including TENS) have little evidence of effectiveness and no evidence for more than a transient benefit. There is a need for well-controlled studies of educational programs and behavioural interventions specifically for patients with chronic neck pain, particularly because these interventions are often employed as part of a multimodal treatment program. Low-power laser treatment and magnetic therapy require some well controlled studies before they can be recommended to neck pain patients or discarded as worthless interventions.¹

Treatments for chronic neck disorders vary from traditional means for pain management and manipulative therapy to group gymnastics, neck-specific strengthening exercises and ergonomic changes at work. Strengthening exercises have been used for the treatment of neck pain, but only a few controlled intervention studies have been conducted to examine active therapy for neck problems. The efficacy of group gymnastics, active exercises and passive physiotherapy has been partly disappointing. In a recent randomized study, investigators found that a multimodal treatment of persistent whiplash symptoms was superior to traditional approaches involving ultrasound and electric stimulation.²

Massage

By definition “*massage (dalk) is a type of exercise practiced with palm and digits by a skilled person on the body surface in varieties of ways to dissolve the morbid matters and to assist the faculties for therapeutic and preventive purpose.*”^{3,4} Massage holds an important place as a therapeutic modality in various Complementary and alternative therapies. Preventive and therapeutic massage is the mainstream treatment of *Unani* medicine since centuries and it is being indicated for range of musculoskeletal diseases since then. A number of *Unani* physicians advocate use of massage for the preventive as well as the curative purpose in various diseases.⁴

Although very few studies found on the management of massage for the neck pain; but very effective and long time promising.

Sherman *et al* suggests that massage is safe and may have clinical benefits for treating chronic neck pain at least in the short term. A total 64 patients were randomized to receive up to 10 massages over 10 weeks or a self-care book. At 10 weeks, more participants randomized to

massage experienced clinically significant improvement on the Neck Disability Index [39% vs. 14% of book group; relative risk (RR) =2.7; 95% confidence interval (CI), 0.99-7.5].⁵

Alam *et al* found massage with therapeutic oil was highly safe and significant both statistically ($p < 0.0005$) and clinically in relieving neck pain and associated symptoms. It has both preventive as well as curative role in management of chronic and acute neck pains. It was an observational study with a sample size 50 over 3 month's duration. Massage was scheduled with test drug on neck for 20 minutes on alternate day in first week and twice a week there after for another 11 weeks. The mean duration of neck pain and VAS (Visual Analogue Score) score at baseline were approx 2½ years and 6; these were completely relieved in a mean of 9 sittings only.^{6,7}

Various Regimens

According to Australian Acute Musculoskeletal Pain Guidelines Group; various treatment regimen for neck pain can be categorised in following groups in respect of their benefits.⁸

I. Evidence of Benefit

- Advice to Stay Active (Activation)
- Exercises
- Multi-modal Therapy
- Pulsed Electromagnetic Therapy (PEMT)

II. Evidence of insufficient Benefit

- Analgesics (Simple)
- Cervical Manipulation
- Cervical Passive Mobilisation
- Electrotherapy
- Gymnastics
- Microbreaks
- Multi-disciplinary Biopsychosocial Rehabilitation
- Muscle Relaxants
- Neck School
- Non-steroidal Anti-inflammatory Drugs (NSAIDs)
- Patient Education
- Spray and Stretch Therapy
- Traction

III. Evidence of No Benefit

- Cervical collars

Acupuncture

It can be seen that, despite many trials, the question of the efficacy of acupuncture for the treatment of chronic mechanical neck pain remains unanswered.⁹

Compared with sham treatment, inactive treatment or waiting list control acupuncture may be more effective than some types of sham treatment or inactive treatment at improving pain relief at the end of treatment or in the short term (less than 3 months), but not in the intermediate term or in the long term in people with chronic mechanical disorders. Needle acupuncture may be more effective than no acupuncture at improving quality of life at 3 months in people with chronic neck pain (very low-quality evidence). We found five systematic reviews (search dates 1993, 1995, 1998 and 2006), and two subsequent Randomized Controlled Trials (RCTs). The systematic reviews between them identified 16 RCTs comparing needle or laser acupuncture versus different sham acupuncture, sham TENS, diazepam, traction, short-wave diathermy and mobilisation) in people with acute or chronic neck pain. None of the reviews performed a meta-analysis. The RCTs identified by the reviews found no consistent differences between acupuncture and other treatments.¹⁰

There is conflicting evidence that acupuncture is more effective compared to placebo and other treatments for neck pain in mixed populations.⁸

Acupuncture reduces neck pain and produces a statistically but not clinically, significant effect compared with placebo.¹¹

There is no evidence on the effects of acupuncture in treating acute neck pain. However, strong evidence shows that acupuncture is not effective treatment for chronic neck pain.¹²

Mix response/benefits are claimed by various studies, many are not convinced.¹³

Analgesics and allopathic drugs

Simple analgesics may be used to treat mild to moderate pain; however there is insufficient evidence that paracetamol is more effective than placebo, natural history or other measures for relieving acute neck pain.⁸

Limited evidence suggests that steroid injections are not effective in treating neck pain.¹²

NSAIDs and anti-depressants have some short term benefits but no published data vindicate their long term use.¹⁴

Behavioural treatment

There have been no RCTs of psychological or behavioural treatment of neck pain as an isolated intervention. A recent study reported positive results (in terms of pain and sick leave) of behavioural intervention on patients with a history of episodes of severe and disabling back and

neck complaints. The data, however, do not permit the independent assessment of the effect of this intervention on neck pain. Therefore, the role, if any, of behavioural interventions in the management of neck pain must remain an open question.¹

Biofeedback

There is no direct information about biofeedback in the treatment of people with non-specific neck pain without severe neurological deficit. Authors found three systematic reviews (search dates 1990, 1993, 1995), which identified no RCTs of biofeedback in people with uncomplicated neck pain.¹⁰

Chiropractic

It is also commonly practiced for neck pain. A chiropractor treats neck pain by checking the cervical vertebrae for misalignment which is called subluxation in chiropractic terminology. This regimen is very less beneficial for muscular cause of neck pain.¹⁰

Dextrose prolotherapy (DP)

Prolotherapy is injection of solution for the purpose of tightening and strengthening weak tendons, ligaments or joint capsules. It works by stimulating the body to repair their soft tissue structure. Despite this DP claims significant reduction in pain, this process is very painful as it requires 40-70 injections of 15% dextrose per sitting; and pain is not relieved completely even in single patient. Their average ending pain and stiffness level were 2-3 and 2-4 respectively on VAS.¹⁴

Education interventions

Many clinical trials include an education arm as one of the modalities investigated. In most of these studies the education is combined with other treatments, making it impossible to determine the independent effect of education. Several studies have been conducted in a manner that permits some preliminary assessment of this type of intervention. On the basis of the available literature, educational interventions have not been shown to have any lasting benefit on neck pain, and even short term effects are highly questionable. This finding agrees with the basic findings of a recent large-scale systematic review of the literature on educational interventions in neck pain.¹

Electrical modalities

Several forms of electromagnetic therapy have been applied to neck pain patients. Although some, such as diathermy, seem to be directed at producing thermal effects, some are considered to have direct electrical effects on pain physiology through their effect on excitable tissues such as nerves or muscles. Among these modalities are galvanic stimulation, interferential current,

neuromuscular stimulation, microcurrent, and TENS (Transcutaneous Electrical Nerve Stimulation) are compared. Of these modalities, the one that has been most investigated relative to effects on neck pain is TENS. Nordemar and Thorner incorporated a treatment group using TENS and a cervical collar in an RCT investigating treatment of acute (<3 days) neck pain. This treatment was compared with a group managed with only a collar and a group receiving traction and mobilization plus a collar. At 01 week and at 03 months, these authors did not find any significant differences between the patients who used TENS and those who did not. No RCTs have investigated the use of TENS in treatment of patients with chronic neck pain. The conclusion of the Philadelphia Panel that TENS and other electrical stimulation modalities have no demonstrated benefit on neck pain.¹

We found no direct information about whether TENS is better than no active treatment.¹⁰

There is insufficient evidence of benefit from TENS to a collar or manual therapy in acute neck pain. There is insufficient evidence that electrotherapy is effective compared to no treatment in acute neck pain.⁸

There is only limited evidence on the effects of TENS in treating acute neck pain.¹²

Exercise therapy, Gymnastics.

Despite the frequency with which exercise is recommended for neck pain treatment and the enthusiasm with which this recommendation is made, relatively few RCTs have directly addressed the question of benefit. Group fitness classes in industrial settings have not been shown to be effective in improving pain or reducing disability. Some RCTs have compared different types of exercise, often accompanied by other interventions, making it impossible to evaluate the benefit of exercise alone. One such study compared a group of patients treated with dynamic exercises with another group receiving range-of-motion stretching, massage, and heat. It found some immediate advantage to the dynamic exercise program. There was, however, no significant difference in the return of neck symptoms during a year of follow up. Overall, the evidence from clinical trials suggests that exercise is beneficial in the management of neck pain, but this recommendation in favour of exercise is based on a limited number of studies.¹

Secondary analyses of a previously published RCT added which found that people with highest pain scores benefited most from exercise, and that both endurance and strength exercises decreased pain at 12 months compared with no specific exercise, with the greatest improvement found within the first 2 months of treatment. Gentle neck exercises commenced early post-injury are more effective compared to rest and analgesic or information and a collar in acute neck pain.⁸

There are no randomised controlled trials on the effect of gymnastics for acute neck pain.

Gymnastics may be no more effective than natural history in mixed populations.⁸

The efficacy of group gymnastics, active exercise and passive physiotherapy has been partly disappointing.¹³

Laser therapy

Several studies and systematic reviews have investigated the possible effects of laser therapy on neck pain. The most detailed analysis, pooling data from three of the studies, found no significant benefit, although the authors note a low statistical power, leading to concern about a possible type 2 errors (that is, rejection of an effective therapy). More recently, Ozdemir and colleagues compared laser therapy with a control laser treatment in patients with neck pain and cervical spondylosis. This study randomly assigned 60 patients with blinded evaluations of pain and function. The investigators report a significant short-term improvement in the active treatment group, versus no change in the control group. Confirmation of these findings and determination of the duration of these short-term changes remain to be investigated.¹

There is limited evidence on the effects of laser treatment for acute and chronic neck pain.¹²

Lifestyle modification

Lifestyle modification at work and at home helps to prevent further worsening of neck pain like an Ergonomic chair for people who work long hours at computer. But once neck pain develops or become chronic one; lifestyle is rarely beneficial in alleviating the neck pain alone.¹³

Manipulation

Spinal manipulation is among the most popular as well as the most controversial of the various therapeutic interventions for neck pain. The two principal reasons for controversy are the well-recognized, albeit rare, incidence of complications following this procedure and the fact that most such treatments are delivered by practitioners who have historically been outside the medical mainstream.¹

There are no RCTs investigating the effect of cervical manipulation in the treatment of acute neck pain. Adverse effects of cervical manipulation are rare but potentially serious.⁸

Regarding chronic neck pain, strong evidence shows that manipulation is not more effective than physiotherapy methods, and moderate evidence suggests that manipulation is not effective treatment for chronic neck pain.¹²

Magnetic treatments / Pulsed Electromagnetic Therapy (PEMT)

Despite interest in the use of static and pulsed electromagnetic fields in the treatment of local pain and the popular enthusiasm for this treatment, no studies have specifically examined the effect on neck pain.¹

Pulsed electromagnetic therapy reduces pain intensity compared to placebo in the short term but is no different to placebo at 12 weeks for acute neck pain.⁸

There is only limited evidence supporting the effectiveness of electromagnetic therapy in treating acute neck pain.¹³

Micro breaks

There is insufficient evidence that taking regular breaks from computer work is more effective compared to irregular breaks for preventing acute neck pain.⁸

Mobilization

Mobilization is a term commonly used to define low-velocity movements within the normal ranges of motion of a joint. Most of these studies have been methodologically weak. A recent, higher quality RCT has compared manual mobilization therapy with conventional physical therapy (exercise, modalities and traction, as indicated) or with continued care by a general practitioner (including analgesics, education and advice) for patients with neck pain of at least 2 weeks' duration. The duration of treatment was 6 weeks, and evaluations were done after 3 and 7 weeks. Significantly more patients who were treated with mobilization were completely recovered or much improved than for either of the other treatments. Pain scores were also significantly lower for this group. Although disability scores improved and were better at all time points in the mobilized group, this improvement did not reach the level of statistical significance. At this time, the best interpretation of the literature is that there is some evidence for effectiveness of mobilization procedures for patients with neck pain. This benefit is seen mostly in short-term reduction in pain and improved range of motion. There is no unequivocal evidence for improvement in functional status or disability. Additionally, any effect on long-term outcome or recurrence remains to be defined.¹

It has Very low-quality evidence in treating the neck pain.^{8,10}

There are no randomised controlled studies on the effect of cervical passive mobilisation compared to natural history or placebo in the treatment of acute neck pain.⁸

Movement therapies

It includes Hatha Yoga, Breema, Feldenkrais, Alexander technique and Hanna sometimes. All are mainly used as preventive techniques to keep the patients away from neck pain prior to its development. But their role is very unsatisfactory to treat the neck pain especially when it become chronic.¹³

Orthoses / Soft cervical collars and Special pillows

Despite the common recommendation of cervical collars for patients with non specific neck pain

(particularly those with a recent injury), such orthoses have never been shown to have beneficial effects on outcomes from such injury. Several clinical trials have included groups of neck pain patients randomly assigned to using or not using cervical collars. These studies have shown that the outcomes in the groups using collars were no better or were worse than in comparison groups without immobilization. This finding argues against the general use of cervical collars in patients without unstable injuries.¹

Cervical traction and soft collars seem to be generally ineffective for non specific neck pain. However, there was no difference for "special neck pillows" compared with a "normal pillows".¹⁰

Collars and pillows for non-specific neck pain-One small RCT found that the exercise or pillow alone did not reduce pain compared with placebo control.⁶²

Soft collars are not effective for acute neck pain compared to advice to resume normal activity and other interventions.⁸

Limited evidence suggests that a neck collar is not effective in treating acute or chronic neck pain.¹²

Reiki, Reflexology and Polarity balancing

These methods of treatment relay on light or indirect contact with the affected area rather than on touching it with techniques used in traditional massage. Their role is very little in treating the neck pain.¹³

Traction

Cervical traction is often used in the management of neck pain because of anecdotal observations of pain improvement and the theoretic benefits of eliminating the effects of weight bearing on the tissues of the neck. Overall, these studies had poor methodological quality, and the data do not permit separation of the effects on patients with radicular or non specific neck pain. One of these RCTs shows some benefit; the other did not. In a study of medium quality, Goldie and Lundquist did not find any significant benefit for cervical traction for treatment of chronic neck pain with brachialgia. Overall, cervical traction has not been shown to benefit neck pain patients significantly, a conclusion that is supported by systematic reviews of the literature.^{1,10}

There are no RCTs investigating the effectiveness of traction for acute neck pain. In mixed populations, there is evidence that traction is of no benefit compared to a range of other interventions for neck pain.⁸

Limited evidence suggests that traction is not effective in treating acute neck pain and moderate evidence suggests that it is not effective in chronic neck pain.¹²

Thermal modalities

Heat and cold have been applied to the neck since antiquity. Modalities of heat and cold are often applied in concert with other therapeutic approaches. For example, most practitioners of spinal manipulation employ some thermal modalities before or after treatments in the belief that doing so will improve the results of treatment. There are many modes of heat application. Heat has the effect of vasodilatation and decreasing muscle tone. Heat can be applied in several ways, ranging from moist to dry heat, to infrared, to ultrasound, or to diathermy treatments. In theory these different modalities have the capacity to heat different tissues, have different depths of penetration, or can be focused on different deep structures. None of the thermal modalities has been shown to make a difference in pain or functional outcomes even in short-term studies. There is one RCT of therapeutic ultrasound in 26 patients with myofascial neck and upper trapezius pain. These authors did not find any difference in pain intensity or pressure pain threshold immediately after treatment as compared with placebo in a group of patients that included neck pain patients. Infrared therapy was tested against placebo, with a finding of no significant advantage for the active treatment. These studies, however, did not have sufficient statistical power to demonstrate conclusively that the treatments were ineffective. On the basis of the available literature, it must be concluded that thermal modalities remain unproven despite their long history in management of neck pain. Of course, thermal treatments are relatively low-risk and (usually) inexpensive procedures. Their application must be considered in this light until further and more definitive studies are performed.¹

Thermal modalities has Very low-quality evidence in treating neck pain.¹⁰

There is only limited evidence that infrared light has any effect at all on acute neck pain.¹²

Combined or Multimodal therapy

The term multimodal treatment typically refers to intensive programs that incorporate exercise as well as pharmacologic, behavioural, and psychosocial interventions. Most literature reports concerning these programs have been uncontrolled, longitudinal studies.¹

There are no randomised controlled studies investigating the effect of multi disciplinary treatment in acute neck pain. Multi-modal (combined) treatments inclusive of cervical passive mobilisation in combination with specific exercise alone or specific exercise with other modalities are more effective for acute neck pain in the short-term compared to rest, collar use and single modality approaches. But still there is insufficient evidence that multi disciplinary treatment is effective compared to other interventions for reducing neck pain in mixed populations.⁸

For chronic neck pain, the use of strengthening exercise, whether in combination with spinal manipulation or in the form of a high-technology MedX program, appears to be more beneficial to patients with chronic neck pain than the use of spinal manipulation alone.¹⁵

Spray and Stretch

Compared with placebo we don't know whether spray and stretch is more effective at reducing pain (very low-quality evidence). We found two systematic reviews (search dates 1990 and 1993), which identified one RCT (74 people with neck pain) comparing spray and stretch versus placebo. The RCT found no significant difference between both groups in pain after five treatments (SMD +0.1, 95% CI -0.6 to +0.8). Spray and stretch therapy appears no more effective than placebo for neck pain in mixed populations. Although it is a common treatment method in sports medicine, but study is of low scientific quality and showed no differences in outcome between active treatment and placebo.¹²

PEMF treatment for non-specific neck pain

Compared with sham PEMF treatment, PEMF treatment may be more effective at reducing pain and pain on passive motion, but not in improving difficulties with activities of daily living, tenderness, self assessment of improvement, or physicians' global assessment in people with neck pain and radiographic evidence of cervical osteoarthritis (very low-quality evidence).¹⁰

Percutaneous radiofrequency neurotomy

Compared with sham treatment Percutaneous radiofrequency neurotomy may be more effective than sham treatment with electrode insertion at increasing the proportion of people free from pain at 27 weeks, and at increasing the median time for half of the pain to return (low-quality evidence).¹⁰

METHODS

The databases utilized for obtaining information from indexed journals are Google, Google Scholar, Scopus, PubMed and Science Direct. The key words neck pain, cervical pain, massage therapy, management of neck pain by massage, were used for the search of literature.

CONCLUSION

In neck pain management several alternate regimens are in vogue. On Meta analysis it was found that no regimen is better than massage for neck pain. Meta analysis finding reports suggest no conclusive benefits are mentioned about any therapy except massage. Some studies have documented statistically significant but no clinically significant effects have been observed in relieving neck pain. It seems reasonable that massage therapy has clear cut edge over other

regimens and would save the patients of neck pain from adverse effects of analgesics and NSAIDs on long as well as on short term basis.

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