J MEDICINE 2007; 8 : 69-73

REVIEW ARTICLE

REVIEW ON EFFICACY OF LUMBER TRACTION ON LOW BACK PAIN

MD. SHAHIDUR RAHMAN[1], MOHD. TASLIM UDDIN[2], MD. AHSANULLA[3]

Abstract:
Back pain is a problem to health professionals and to the society. Low back pain is now one of the most common reasons for work loss, health care use and sickness benefit. There are many causes of low back pain. Non-specific mechanical low back pain is most common. Treatment options include surgical and conservative. Conservative treatment is usually given with analgesics, thermo therapy and lumber traction. Treatment plan and referral is made on the basis of judgment on clinical findings. The aim of the present review was to assess the efficacy of traction for LBP patients with or without radiating pain. To reflect clinical practice, we need to understand the clinical parameters and treatment regimes being used by clinicians, and these must be addressed before a trial can be designed to look further at the effectiveness of traction for LBP with or without radiating pain. The evidence for the use of traction in LBP remains inconclusive because of the continued lack of methodological rigor and the limited application of clinical parameters as used in clinical practice.

Keywords: Low back pain, Lumber traction, Efficacy.

Introduction:

Approximately 80% of the population experiences low back pain (LBP) at some time in their lives; 90% will resolve within 2 to 4 weeks, but 60% to 80% will have recurrence within 1 year.[1] Although back pain is the most frequently presented disorder of the musculoskeletal system, little consensus exists about its management, which often includes referral to physiotherapy where the choice of treatment modalities is wide and varied. However, the efficacy of many physiotherapeutic interventions remains questionable[2.] One of the treatment options is traction, which is often combined with other treatments, for example, manual therapy, exercises, heat, electrotherapy, and advice. Surveys would indicate the continued use of traction in the physiotherapy management of LBP: 7% in Southern Ireland and the United Kingdom, [3] 13.7% in Northern Ireland, [4] 7% in the Netherlands,[5] 21% in the Unite States,[6] and up to 30% in acute LBP with sciatica in Canada.[7] To apply the traction force, auto traction and manual traction rely on the strength of the patient or therapist, gravitational traction on the weight of the patient, and motorized traction on a motorized machine. Motorized traction can be more successfully standardized for repeatability in a trial. Research to date has included all these modes of traction. The variation in treatment modes may be an additional factor why conclusive results of traction's effects have remained elusive.

Current Evidence:

The evidence to date is conflicting; the UK Royal College of General Practitioners guidelines[8] state that "traction does not appear to be effective for LBP or radiculopathy," which has discouraged many clinicians from using it. However, these guidelines were based on the only available systematic review[9] of randomized controlled trials (RCTs), which examined the efficacy of traction for back and neck pain; seventeen RCTs were included in this review, three for back and neck pain and fourteen for LBP. The review concluded that because of the poor methodological quality of the studies, it was not possible to formulate a strong and valid judgment about the efficacy of either lumbar or cervical traction.

1. Assistant Professor, Department of Physical Medicine and Rehabilitation, Bangabandhu Shiekh Mujib Medical University
2. Associate Professor, Department of Physical Medicine and Rehabilitation, Bangabandhu Shiekh Mujib Medical University
3. Assistant Professor, Department of Physical Medicine and Rehabilitation, Bangabandhu Shiekh Mujib Medical University

The Cochrane database of abstracts of reviews of effectiveness[10] agreed with this conclusion and highlighted the need for rigorous RCTs before research-based guidelines could be agreed for traction. The lack of consensus in this area is further highlighted by the recent Philadelphia guidelines, [11] that state From the School of Rehabilitation Sciences, University of Ulster, Jordanstown, Northern Ireland.

Systematic reviews: In the past, systematic reviews have concentrated solely on methodological quality; however, little attention has been given to the quality and appropriateness of the intervention, despite the fact that inadequacies in these areas may also lead to substantial bias.[12] The practitioner implementing evidence based practice needs to know that the evidence is based on findings from high-quality research methods and that the research intervention reflects the treatment protocols that he/she uses. If the research evidence does not address these two factors, clinicians will not implement the findings. It is difficult to address clinical appropriateness in research into LBP management by physical therapy because treatment tends to be tailored to fit the patient's needs and no patients are identical. In the present review, all the studies used traction as the sole intervention. The use of various combinations of treatment has an obvious implication for the design of future trials. It is also important to look at the interventions individually and to examine whether they are acceptable to clinical practice. To explore this issue, we investigated whether taking account of the traction treatment parameters would alter the conclusions drawn from the available evidence. The application of optimal treatment weights, length of the treatment session, frequency of treatment, and length of the overall traction program are areas that have had limited research. Therefore, the determination of optimal parameters can only be drawn from recommendations from expert opinion [13,] supplemented by limited evidence on the mechanical and physiologic effects of traction.[14 - 21]

Determination of Optimal Treatment Parameters:
In deciding what traction weight to apply, one must consider two aspects: (1) what weight will overcome friction between the body and the bed; and (2) what amount of force is required to exert an effect on the lumbar spine. Judovich [22] showed that a traction force of 26% of the patient's body weight was required to overcome friction. The use of a split tabletop with friction free rollers reduces this to a negligible amount. In its absence, a force in excess of 26% of the body weight must be used before any effect can be produced at the lumbar spine. Optimal weights for traction have been investigated by assuming that the effect of traction is achieved by intervertebral widening or reduction of disk protrusion; however, only the former has been demonstrated experimentally.[7, 21,] Despite these studies, it remains unclear what magnitude of force is required to cause the desired effect in the intact human spine. The mechanism by which traction may have its effects is not fully understood, and the neuromodulation of pain, which may require very low weight, must also be considered as a possible effect. This notwithstanding, clinical experts recommend using motorized traction on a friction-free surface and advocate a wide range of traction weights within their treatment regimes. Absent research findings, clinical experts recommend a variation of treatment times for example Hicklings [23] suggest 20 to 40 minutes, with an average of 30 minutes. Clinical experts showed more agreement in terms of the frequency of treatment. Most suggested that acute nerve root problems require traction on a daily basis for 5 to 6 days a week, for at least two weeks. Chronic problems may be treated 2 to 3 times weekly for at least 3 weeks because the chronic problem may be difficult to resolve.

Objectives and methods: The main objectives of the review were to ascertain if the conclusion of the Van der Heijdan[9] review is altered in light of the available evidence since 1992, and to ascertain whether taking account of recommended clinical parameters for the use of traction alters the conclusion. The subsidiary objectives were to assess the relevance of the mode of traction, and to assess the relevance of traction for acute and chronic LBP. To be included in the review, a trial had to meet the following criteria: (1) a randomized controlled design; (2) participants were over the age of 18 years and were treated for LBP with or without radiating pain, with or without radiation to the lower extremities; (3) at least 1 of the intervention groups had to receive traction as the main or sole intervention (4) the comparison group had to receive sham traction (placebo traction or low-weight traction, which is perceived to be ineffective) or another conservative treatment modality (trials comparing different types of traction were excluded); (5) the study had to use at least 1 of 4 primary outcomes: pain (e.g. visual analog scale,) a global measure of improvement,

a back pain–specific functional status or generic functional status.

Outcome Ratings:
The outcome of each study was determined by the results of the primary outcome measures (at least 1 primary outcome). A study was considered positive if traction was more effective than the referenced treatment. A study was considered negative if there was no difference between traction and the referenced treatment, or if the referenced treatment was more effective than traction. A study was considered inconclusive if there were conflicting results between the primary outcome measures, for example, a positive result on 1 primary outcome and a negative result on another primary outcome. Following this, applying the US clinical practice guideline for rating acute low back problems in adults summarized the results. [24] This rating system consists of four levels of scientific evidence based on the quality and the outcome of the studies: (1) strong evidence, generally consistent findings in multiple high-quality RCTs; (2) moderate evidence, generally consistent findings in 1 high-quality RCT and 1 or more low quality RCT or by generally consistent findings in multiple low-quality RCTs; (3) limited or conflicting evidence, only 1 RCT (either high or low quality) or inconsistent findings in multiple RCTs; and (4) no evidence, no RCTs.

Results:
Nine studies [25- 33] reported negative findings. Three low quality studies [34-36] were found to have positive findings. One pilot study [37] had inconclusive findings, but showed a tendency toward a positive result; the author suggested that this was possibly because of the small sample numbers in the trial. The overall outcome showed a trend toward traction being ineffective, however, because of the low quality of the various studies' research methods, no definitive conclusions are possible.

Placebo comparisons: Six studies compared traction with sham traction. Sham traction is a low-weight or placebo traction that the given researcher considers to be ineffective and all gave negative results except for the inconclusive result of Moret et al.[37]

Conservative treatment comparisons: Seven studies compared traction with other conservative treatments. Three studies used motorized traction with a split table top, [30,32,38] three used motorized traction without a split tabletop, [26,27] and one used manual traction. Traction was compared with no treatment, manipulation, exercises, corset, interferential, transcutaneous electric nerve stimulation (TENS), heat, and massage. All of these studies had low methodologic quality scores (range, 0–3) and only 2 studies [34,35] reported a positive effect of motorized traction when compared with a treatment package that included hot packs, massage, mobilization and strengthening exercises, and TENS, respectively.

Limitations of this review:
A primary limitation of the present review was those articles were limited to the English language. Research on traction has traditionally taken place in the Netherlands and Germany and therefore we may have excluded some suitable studies. This review showed that the evidence for the effectiveness of traction in the management of LBP has not changed. The studies reviewed were generally of poor quality, and it was not possible to make recommendations for the use of traction based on the results of these trials. When the appropriateness of the clinical intervention was addressed, the level of evidence was reduced from moderate to limited evidence. This highlights the importance of paying close attention to the clinical appropriateness of the intervention in addition to methodological quality, and may, if used in future research, lead to wider implementation of research findings.

Recommendations for Further Study
The study by Beurskens et al [25] was the only high-quality article reviewed and it addresses the sub acute to chronic LBP patient population. This study shows that a high-quality study in this area can be achieved [38,] but the flaws we describe in this article need to be overcome (traction parameters, traction as the sole intervention). One group of patients that has not been addressed by a high-quality study is the patients with acute radiculopathy. Many researchers have attempted to study this area, but their studies have failed because of the use of poor inclusion criteria and other methodological problems.

Classification of LBP is a problem, but radicular pain is perhaps easier to classify than many other, less distinct groups. In designing a study, one must give attention not only to methodological quality but also to the clinical appropriateness of the intervention. To

reflect clinical practice, we need to understand the clinical parameters and treatment regimes being used by clinicians, and these must be addressed before a trial can be designed to look further at the effectiveness of traction for LBP with or without radiating pain.

Conclusion:

The evidence for the use of traction in LBP remains inconclusive because of the continued lack of methodological rigor and the limited application of clinical parameters as used in clinical practice. Further trials, which give attention to these areas, are needed before any firm conclusions.

References:

1. Hides JA, Richardson CA, Jull GA. Multifidus muscle recovery is not automatic after resolution of acute, first episodes low back pain. Spine 1996; 21:2763-9.
2. Van Tulder MW, Assendelft WJ, Koes BW, Bouter LM. Method guidelines for systematic reviews in the Cochrane Collaboration Back Review Group for Spinal Disorders. Spine 1997; 22:2323-30.
3. Foster NE, Thompson KA, Baxter GD, Allen JM. Management of nonspecific low back pain by physiotherapists in Britain and Ireland. Spine 1999; 24:1332-42.
4. Gracey J. Physiotherapy management of low back pain. A survey of current practice in Northern Ireland [dissertation]. Jordanstown, Northern Ireland: Univ Ulster, 2001.
5. Van der Heijdan GJ, Beurskens AJ, Dirx MJ, Bouter LM, Lindeman E. Efficacy of lumbar traction: a randomised clinical trial. Physiotherapy 1995; 81:29-35.
6. Jette AM, Delitto A. Physical therapy choices for musculoskeletal improvements. Phys Ther 1997; 77:145-54.
7. Li LC, Bombardier C. Physical therapy management of low back pain: an exploratory survey of therapist approaches. Phys Ther 2001; 81:1018-27.
8. Waddell G, McIntosh A, Hutchinson A, Feder G, Lewis M. Low back pain evidence review. London: 1999. Royal Coll General Practitioners.
9. Van der Heijdan GJ, Beurskens AJ, Koes BW, Assendelft WJ, de Vet HC, Bouter LM. The efficacies of traction for back and neck pain: a systematic, blinded review of randomised clinical trial methods. Phys Ther 1995; 75:93-104.
10. The Database of Abstracts of Reviews of Effectiveness. York (UK): Cochrane Library; 1997. CRD Database No. DARE- 978020.
11. Philadelphia Panel evidence-based clinical practice guidelines on selected rehabilitation interventions for low back pain. Phys Ther 2001; 81:1641-74.
12. Bjordal JM, Greve G. What may alter the conclusion of reviews? Phys Ther Rev 1998; 3:121-32.
13. Saunders HD. Use of spinal traction in the treatment of neck and back conditions. Clin Orthop 1983; 179: 31-7.
14. Colachis SC, Strohm BR. Effects of traction on separation of lumbar vertebrae. Arch Phys Med Rehabil 1969;44:251-8.
15. Gillstrom P, Ericson K, Hindmarsh T. Autotraction in lumbar disc herniation. A myelographic study before and after treatment. Arch Orthop Trauma Surg 1985; 104:207-10.
16. Gupta RC, Ramarao SV. Epidurography in reduction of lumbar disc prolapse by traction. Arch Phys Med Rehabil 1978; 59:322-7.
17. Hood CJ, Hart D, Smith HG, and Davis H. Comparison of electromyographic activity in normal lumbar sacrospinalis musculature during continuous and intermittent pelvic traction. J Orthop Sports Phys Ther 1981;2:137-41.
18. Judovich B, Nobel GR. Traction therapy, a study of resistance forces. Am J Surg 1957;93:108-14.
19 Lee RY, Evans JH. Loads in the lumbar spine during traction therapy Aust J Physiother 2001; 47:102-8.
20. Onel D, Tuzlaci M, Sari H, Demir K. 1989 Computed tomographic investigation of the effect of traction on lumbar disc herniations. Spine 1989; 14:82-90.
21. Twomey LT. Sustained lumbar traction. An experimental study of long spine segments. Spine 1985; 10:146-9.
22. Judovich BD. Lumbar traction therapy: elimination of physical factors that prevent lumbar stretch. JAMA 1955; 159:549-50.
23. Hicklings J. Spinal traction techniques. Physiotherapy 1972; 58:58- 63.
24. Bigos S, Bowyer O, Braen G, et al. Acute low back problems in adults. Clinical practice guideline no. 14. Rockville: Agency for Health Care Policy and Research, Public Health Service, US Department of Health and Human Services; 1994. AHCPR Publication No. 95-0642

25. Beurskens AJ, de Vet HC, Koke AJ, et al. The efficacy of traction for non-specific low back pain 12 week and 6 month results of a randomized clinical trial. Spine 1997; 22:2756-62.

26. Werners R, Pynsent PB, Bulstrode CJ. Randomized trial comparing interferential therapy with motorised lumbar traction and massage in the management of low back pain in a primary care setting. Spine 1999; 24:1579-84.

27. Matthews JA, Mills SB, Jenkins VM, et al. Back pain and sciatica: controlled trials of manipulation, traction, sclerosant and epidural injections. Br J Rheumatol 1987; 26:416-23.

28. Weber H. Traction therapy in sciatica due to disc prolapse (does traction treatment have any positive effect on patients suffering from sciatica caused by disc prolapse?). J Oslo City Hosp 1973; 23:161-76.

29. Coxhead CE, Inskip H, Meade TW, North WR, Troup JD. Multicentre trial of physiotherapy in the management of sciatic symptoms. Lancet 1981; 1:1065-68.

30. Matthews JA, Hicklings J. Lumbar traction: a double blind controlled study for sciatica. Rheumatol Rehabil 1975; 14:222-5.

31. Pal P, Mangion P, Hossian MA, Diffey LA. Controlled trial of continuous lumbar traction in the treatment of back pain and sciatica. Br J Rheumatol 1986; 25:181-3.

32. Weber H, Ljunggren AE, Walker L. Traction therapy in patients with herniated lumbar intervertebral discs. J Oslo City Hosp 1984;34:61-70.

33. Ljunggren E, Walker L, Weber H, Amundsen T. Manual traction versus isometric exercises in patients with herniated intervertebral lumbar discs. Physiother Theory Pract 1992; 8:207-13.

34. Sherry E, Kitchener P, Smart R. A prospective randomized controlled study of VAX-D and TENS for the treatment of chronic low back pain. Neurol Res 2001; 23:780-4.

35. Lidstrom A, Zachrisson M. Physical therapy on low back pain and sciatica. Scand J Rehabil Med 1979; 2:37-42.

36. Larsson U, Choler U, Lidstrom A, et al. Autotraction for treatment of lumbago-sciatica. Acta Orthop Scand 1980; 51:791-8.

37. Sherry E, Kitchener P, Smart R. A prospective randomized controlled study of VAX-D and TENS for the treatment of chronic low back pain. Neurol Res 2001; 23:780-4.

38. Koes B. Commentary: high force traction did not improve the clinical course of sub-acute and chronic non-specific low back pain. Aust Physiother 1998; 44:213-4.