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Acupuncture for Low-Back Pain

Poovadan Sudhakaran, MBBS, PhD, MastACU, MastTCM

ABSTRACT

Low-back pain affects 84% of the world's population. At present, no method of treatment can be considered as the method of choice. Acupuncture is effective, scientific, cost-effective, and free from major side-effects. Three illustrative cases, showing the beneficial effects of acupuncture are presented. Attention is drawn to the possible presence of underlying sacroiliac-joint dysfunction, which could masquerade as sciatica, hip pain, and/or groin pain.

Keywords: sciatica, back pain, groin pain, lumbago, hip pain, acupuncture

INTRODUCTION

BACK PAIN ALWAYS EXISTED in human history and is the price we pay for our erect posture. The Edwin Smith Papyrus (1500 BCE)[1] referred to a case (''case 48'') wherein a straight leg-raising sign was mentioned.[2] Degenerative spinal changes have been found in Neanderthal hominids[3] and in Egyptian mummies,[4] and have been described throughout human history. Thomas Sydenham, MD (1624–1689 AD), who established our present concept of individual diseases with characteristic signs and symptoms, classified low-back pain (LBP) with the disease called rheumatism.[5] This disorder was supposed to be caused by exposure to cold and dampness, according to William Heberden, MD.[6] Various other causes that could produce LBP were then recognized, such as aortic aneurism, gastric cancer, tuberculosis of the spine (Potts' disease) and gynecologic disorders.[7] In 1828, Thomas Brown, MD, a physician in a royal infirmary, suggested, for the first time, that the spine and the adjacent nerves could be the source of back pain.[8] The Lancet Commission, in 1862, attributed back pain to railway travel, causing repeated injuries to the spine.[9] This phenomenon was called *railway spine*.

Interest in sacroiliac joint pathology causing LBP came in 1900 when LBP was attributed to acute and chronic S-1 joint infections.[10] Treatment involved surgical drainage or excision of the S-1 joint. Goldthwait and Osgood found that relaxation or increased mobility of the S-1 joint as seen in pregnancy, menstruation, and trauma caused pain radiating from that joint to the hip or even the leg.[11] These researchers attributed this to slipping or subluxation of the joint. The treatment for this condition involved strapping or plaster immobilization of the S-1 joint. Smith-Petersen and Rogers published a complete study in 1926 of the diagnosis, operative procedures, and results of sacroiliac fusion and claimed a 90% success rate in relief of this pain.[12] Yeoman opined in 1928 that back pain and sciatica might be caused by the piriformis muscle irritating the lumbosacral plexus or the sciatic nerve itself.[13] This is called *piriformis syndrome*. There is no diagnostic test apart from image-guided injection of a local anesthetic into the piriformis muscle, which usually eliminates the symptoms.

After an article from Mixter and Barr in 1934, orthopedic surgeons' emphasis on LBP and sciatica shifted to the intervertebral disc.[14] Subsequent years saw an explosion of disc surgery to the extent that it was used to treat all forms of LBP with or without sciatica. Failed LBP surgery cases flooded pain clinics. This was due to the assumption that, if disc prolapse was the cause of sciatica, disc degeneration was the cause of LBP. This assumption is still valid today; despite the fact that a degenerated disc does not press on any structure, nor is that disc the seat of inflammation. The associated spondylolisthesis, lumbar-canal stenosis or associated scoliosis can be a source of pain.

Templestowe, Victoria, Australia.

Current modern biomedicine concepts include:

- Most LBP is caused by mechanical spinal disorders, which are often self-limited.
- ''Red flags'' include history of trauma, fever, weight loss, immunosuppression, osteoporosis, long-term use of steroids, a previous cancer diagnosis, intravenous drug use, 70 + age, focal neurologic deficits, an abdominal aorta diameter >5 cm, lower-extremity pulse deficits, meningismus, and severe nocturnal or disabling pain; these cases should be investigated further.
- Abdominal aortic aneurism should be ruled out in elderly patients, even if no physical signs suggest that diagnosis.[15]
- Normal spinal-cord function should be established by tests of sacral-nerve function (anal wink reflex, rectal tone, bulbocavernosus reflex, motor strength, and knee and ankle reflexes).
- In patients with nonradicular pain, treatment can be started without extensive evaluations.

Recommended biomedical treatments are:

- Acetaminophen or nonsteroidal anti-inflammatory drugs; or, rarely, a short course of opioids
- Physiotherapy stabilization exercises
- A short course of oral steroids
- Epidural corticosteroid injection in intractable cases (this can have serious untoward effects in some cases)
- A short course of muscle relaxants (cyclobenzarpine, methocarbamol, metaxalone, benzodiazepines)
- Spinal mobilization and manipulation.

It is important to note that many asymptomatic people have abnormal X-ray findings, and in 1 study involving patients age 60 +, 36% had disc herniations, 21% had spinal-canal stenosis, and more than 90% had degenerated or bulging intervertebral discs.[15] These conditions, however, may be ''innocent bystanders.''

LBP IN CHINESE MEDICINE

Early Chinese Medicine Concepts

In the *Yellow Emperor's Classic of Chinese Medicine*,[16] Huang Di, the Yellow Emperor who reigned during the middle of the third millennium BCE, discusses with his minister, Qi Bo, the treatment of LBP: Qi Bo recommended:

- *Needle BL 40*—for back pain due to the Bladder Channel and involving the spine, neck, and hip. In this case, the patient feels as if he or she is carrying a heavy weight on the back.
- *Needle GB 34*—when the backache is due to Gallbladder Channels and the patient feels as if he or she is being needled on the skin; the patient cannot bend, lift the head, nor turn the body.
- *Needle ST 36*—when the back pain, due to the Stomach Channel, makes it difficult to turn around and the patient feels dizzy when turning.
- *Needle KI 7*—for a backache due to the Kidney Channel involving the inner spine.
- *Needle LR 5*—for back pain due to the Liver Channel making the patient's the waist stiff like a drawn bow.

Current Chinese Medicine Concepts

Chinese Medicine considers the lower back as the dwelling place of the Kidneys. The majority of LBP is associated with Kidney Deficiency. The Bladder, which has a Yin/Yang relationship to the Kidney, has its channel running along the spine on both sides, and the Bladder's muscle channel embraces the waist. The Governor Vessel Channel traverses along the middle of the spine; the Yang Heel vessel influences the area between the hip and the spine; and the Belt Vessel runs horizontally in the lower back. These facts are important for selecting points. Deficient Kidney, disrupted Qi along the Bladder Channel, injury to the muscle channels in the lower back, and attacks of Wind and Dampness (rheumatism) all contribute to blockage of circulation of Qi and Blood in the lower back, producing LBP.

The recommended points for addressing chronic LBP are:

- SI 3 and BL 62 in that order to open the GV to strengthen the spine and Kidneys
- BL 62 and SI 3 in that order to open the Yang Stepping vessel if the pain is between the spine and the hip
- GB 41 and TB 5 in that order to open the Belt Vessel, which runs horizontally in the lower back
- BL 60, an important distal point for back pain
- KI 4 to correct Kidney Deficiency
- SP 3 to invigorate the spine
- GV 20, a distal point, when the pain is on the lower part of the lumbosacral spine
- HT 7, a sedative point, especially useful because of the axis relationship between the Kidney and Heart Channels (*Shao–Yin* Axis)
- All *AhShi* points; especially in the region of the sacroiliac joint (S-1 joint)
  Strong stimulation involving slow insertion and large amplitude twirling, in which the needle is retained for 20–30 minutes after arrival of De Qi
- BL 20
- *Shiqizhuixia*, an Extra point below the spinous process of L-5
- BL 54 if the pain radiates to the buttocks
- *Tunzhong*, an Extra point lateral to BL 54, halfway between the midline and lateral edge of the buttock; look for tenderness
- *Yaoyan*, an Extra point in the depression lateral to the space between the spinous processes of L-4 and L-5
- Needle twice weekly.

For an acute sprain of the back, the etiology parallels that of Western medicine. The principle is to clear the blocked Qi, and using the points from the Kidney and Bladder Channels and the Extra meridians GV, Yang Heel, and Belt Channels, as needed for chronic LBP. In addition, one should needle GV 26 with strong stimulation, needle BL 40 and KI 2 to induce a few drops of blood, as well as pricking all *AhShi* points.

BL 40 is the Grand Point for the lower back, but should only be used for acute back pain; this point is not recommended to address chronic conditions. Needle daily.

If the pain extends down the leg (sciatica), the recommended points are GB 30, BL 31, BL 37, BL 40, and BL 57. Any further elaboration on sciatica is beyond the scope of this article.

Auricular Points include Lumbar Vertebrae, Lumbago, Adrenal, Sub Cortex, Neurogate Buttocks, Lumbar Spine Phase II, Lumbar Spine Phase III, Point Zero, *Shen Men*, and Thalamus. Select points according to tenderness.

Battlefield Acupuncture (BFA)—using the Cingulate Gyrus, Thalamus, Omega 2, Point Zero, and Ear *Shen Men* in that order—is quite effective for most cases of acute LBP and, in some cases, for chronic LBP. This is referenced in the section entitled EVIDENCE FOR ACUPUNCTURE.

ILLUSTRATIVE CASES

Case 1

A heavily built 29-year-old manual laborer/body builder was seen by the author for left-sided sciatica and LBP of 1½ year's duration. The pain radiated from his lower back to his left posterior thigh as far as the knee, and also radiated to both groins. There were no specific aggravating factors, and this patient's pain was more-or-less constant. Magnetic resonance imaging (MRI) showed posterior disc protrusion at the L-5/S-1 level, causing severe spinal-canal stenosis impinging on the S-1 roots, and posterior L-4/L-5 disc protrusion impinging on the L-5 root on the left. He was receiving chiropractic treatment but did not obtain any relief, and his surgeon recommended a laminectomy. This patient came for acupuncture, as he did not want surgical treatment.

Because he had no neurologic signs and there was definite tenderness over the left S-1 joint, 2 mL of a local anesthetic (lignocaine) were injected over the left S-1 joint region and this obliterated all his symptoms. A diagnosis of left sacroiliac dysfunction was made despite the MRI findings. He was treated with spinal/sacroiliac mobilization, stretching exercises, and acupuncture using:

- GB 41 left and TB 5 right, in that order, to open the Belt Vessel
- BL 62 left and SI 3 right to open the Yang Stepping Vessel
- *Note:* In women the sides would be reversed
- BL 60 bilaterally
- *AhShi* points over the S-I joint left with strong stimulation
- GB 34 (the Influential point for soft tissues) bilaterally
- HT 7
- Deep friction over the left S-1 joint.

He was treated twice weekly for 2 months and then once per month. He was advised not to cause excessive strain on his back at work and in the gym. He continues his stretching exercises and is almost symptom-free, but has a recurrence of pain whenever he strains his back at work.

Case 2

A 39-year-old man, whose work involved lifting heavy drums, was seen by the author for constant LBP radiating down his left leg along the S-1 distribution down to the posterior thigh. An MRI in 2019 showed L-5/S-1 disc protrusion impinging on the L-5/S-1 nerve roots. An L-5/S-1 discectomy was performed a year ago and the patient's pain still continued. His left ankle jerk was absent. The only other sign was tenderness over the left sacroiliac joint. Local anesthetic injection to the S-1 joint area relieved all his symptoms. A diagnosis of left sacroiliac dysfunction was made. He was treated with acupuncture using the following points:

- GB 41 left and TB 5 right to open the Belt Vessel
- BL 62 left and SI 3 right to open the Yang Stepping Vessel
- BL 60 on both sides as a distal point
- *AhShi* points over the left sacroiliac joint
- Deep friction over posterior sacroiliac ligament over the left side.
- Sacroiliac stretching exercises and spinal mobilization.

He was instructed to avoid heavy lifting. He was given treatment twice per week for 6 weeks with near-total relief of his symptoms. He is to continue treatment on a monthly basis.

Case 3

A 69-year-old housewife was seen by the current author for persistent LBP radiating to the right hip for more than 6 years. Apart from diffuse tenderness over the right back and over the greater trochanter of the right hip, there were no other clinical findings.

An X-ray of the lumbosacral spine showed generalized facet arthropathy. An ultrasound (US) showed trochanteric bursitis on the right side. A local injection of methylprednisolone and lignocaine into the trochanteric bursa did not relieve her pain. Her sacroiliac joint was tender and infiltration of lignocaine over the right sacroiliac joint relieved most of her symptoms. She was treated using the same group of points as in case 2 except for the reversal of sides used for females.

Two months of twice-weekly treatments relieved most of her symptoms.

Summary

These 3 cases show how sacroiliac dysfunction can masquerade as groin pain, sciatica, and hip pain. In the current author's practice, S-1 joint dysfunction has been the most-common cause of LBP.

EVIDENCE FOR ACUPUNCTURE

Carlsson and Sjölund, in a randomized clinical trial involving 50 patients, found significant decreases in LBP at 1, 3, and 6 months in a verum acupuncture group, compared to a placebo group.[17] In addition, there was improvements in returns to work, quality of sleep, and analgesic intakes.

Ceccherelli et al., in a randomized controlled blind study involving 31 patients with LBP, found considerable improvement after acupuncture; better results were observed after 10 weekly sessions than after 5 weekly sessions.[18]

Wendenberg et al., in a randomized study involving 60 pregnant, women found that acupuncture relieved pain better than physiotherapy.[19]

Kvorning et al., in a randomized study involving 73 women in late pregnancy, found that acupuncture relieved pelvic and LBP without adverse effects.[20]

Molsberger et al., in a randomized, blinded controlled trial involving 186 inpatients, demonstrated that acupuncture, when added to conservative orthopedic treatment, reduced pain and improved mobility to a significant degree, considerably more than sham acupuncture did.[21]

Meng et al., in a randomized controlled trial involving 55 patients over age 60, found that acupuncture reduced LBP significantly when used as an adjunctive treatment to standard therapy.[22]

Sator-Katzenschlager et al., in a randomized double-blinded trial involving 61 patients, found continuous electrical acupuncture stimulation of auricular acupuncture points significantly reduced pain and improved psychologic well-being in patients with chronic LBP.[23]

Yuan et al.,[24] in a review of 33 randomized clinical trials involving 6359 LBP patients, concluded that:

- There was moderate evidence that acupuncture was more effective than no treatment for short-term pain relief and functional improvement.
- There was no statistically significant difference between verum acupuncture and sham acupuncture for pain relief and functional improvement.
- There was strong evidence that acupuncture plus conventional therapy was more effective than conventional therapy alone for pain relief and moderate evidence for reducing functional disability.

Xiang et al., in a review involving 14 randomized clinical trials (with a total of 2110 participants) of nonspecific LBP concluded that there were statistically significant differences in pain reduction between verum acupuncture and sham acupuncture or placebo therapy, but that this did not apply to function.[25]

Liu et al.,[26] in an overview of 12 systematic reviews on the effect of acupuncture on LBP reached the following conclusions:

- Based on 7 systematic reviews, acupuncture was more clinically effective for pain relief and functional improvement than no treatment as observed in short-term follow-up.
- Based on 5 systematic reviews, acupuncture as an adjuvant to conventional therapy provided short-term clinically relevant reduction of pain and improvement of functional measures for chronic LBP.

Fox et al., in a pilot randomized clinical trial involving 30 patients with acute LBP, demonstrated that BFA—using auricular acupuncture points Cingulate Gyrus, Thalamus, Omega 2, Point Zero, and ear *Shen Men* in that order—resulted in 80% relief of pain on treatment day 1, 52% on treatment day 7, and 51% on treatment day 30.[27,28]

DISCUSSION

The human erect posture is the symbol of our biologic superiority but brings with it certain serious mechanical drawbacks, such as spondylolisthesis, disc protrusion, disc degeneration, facet arthropathy, LBP, and sciatica. LBP is not a disease in itself but rather a group of symptoms that affect patients in all age groups. It is the most-common musculoskeletal condition affecting the adult population with a prevalence of up to 84%.[29] The condition is called chronic LBP when it lasts more than 12 weeks. According to a 2006 American review, the economic burden represented by healthcare costs and lost productivity due to LBP exceeded $100 billion per year.[30]

Recurrent back pain occurs in 25%–62% of patients within 1–2 years with up to 33% having moderate pain and 15% having severe pain.[31] In 2002, the World Health Organisation anticipated that, as the world population aged, the incidences of LBP would increase substantially and become one of the leading conditions for which aging patients would require medical intervention.[32]

The American College of Physicians recommended nonpharmacologic treatments for LBP as the first option,[33] and these included massage, acupuncture, spinal manipulation, *T'ai chi*, and yoga. Treatments such as transcutaneous electrical nerve stimulation, US, short-wave diathermy, traction, and back support are considered to be ineffective.

Psychologic therapies, such as cognitive–behavioral therapy, progressive relaxation, and mindfulness-based stress reduction may have some value.

Pharmaceutical treatments are recommended only if the above methods fail. Paracetamol is no longer recommended[33] due to its ineffectiveness. Nonsteroidal anti-inflammatories are to be used in the lowest effective doses for the shortest-possible durations, taking into account the risks of gastrointestinal, renal, and cardial toxicity. Routine use of opioids cannot be recommended because benefits are small, substantial risks exist, and these drugs require constant monitoring. Pregabalin is of doubtful value, muscle relaxants offer temporary benefits, epidural injections offer short-term benefits (<4 weeks). Evidence for the benefits of radiofrequency denervation for chronic LBP is equivocal. Pain relief offered by spinal-fusion surgery for discogenic pain is only slightly greater than nonsurgical management.[34] For a herniated disc, early surgery is associated with quicker relief of symptoms, compared to conservative management, but the benefits disappear over more than 1 year follow-up.[35] For symptoms associated with lumbar spinal stenosis, the benefits of surgery and conservative medical treatment are similar.[36]

Acupuncture Is Effective

Beneficial effects of acupuncture on musculoskeletal pain are well-documented. In 2 patient-level meta-analyses of randomized clinical trials involving 18,000 and 21,000 patients with chronic musculoskeletal pain, acupuncture was substantially more effective than standard care and significantly better than sham acupuncture.[37,38] In a meta-analysis of 17,922 patients with chronic nonmalignant pain, 90% of the pain-relieving effects of acupuncture were sustained at 12 months.[39]

Acupuncture Is Cost-Effective

Witt et al., in a randomized controlled trial plus a non-randomized cohort involving 11,630 patients, evaluating the clinical and economic effectiveness of acupuncture for chronic LBP, found that acupuncture in addition to routine care resulted in a clinically relevant benefit and was cost effective.[40]

Ratcliffe et al., in a randomized controlled trial involving 241 patients receiving acupuncture for LBP found that acupuncture was cost-effective in the longer-term.[41]

Acupuncture Is Safe

In a cumulative review of more than 1 million acupuncture treatments, the risk of serious adverse events was estimated to be 0.05 per 10,000 treatments and 0.55 per 10,000 individual patients.[42] Similar findings were reported in 229,230 patients with more than 2 million visits.[43]

Acupuncture Is Scientific

Acupuncture-point stimulation leads to release of endorphins and other neurohumeral factors leading, in turn, to changes to processing between the brain and spinal cord.

Acupuncture has shown efficacy in increasing microcirculation and reducing inflammation by promoting release of vascular- and immunomodulatory factors. This, in turn, supports better joint movements, relieve stiffness of muscles as well as healing of swelling and bruising.[44,45] There is still much more to be learned about the physiologic basis of acupuncture therapy.

While acupuncture is scientifically based, more effective than sham acupuncture,[46] more effective than standard care; is cost-effective; and has an excellent safety profile, with the current level of evidence, it is hard to recommend it as a proven monotherapy of choice for LBP. At best, acupuncture can be added to the current therapeutic armamentarium as an option, especially for people who prefer not to take analgesics, or as part of a multitherapy protocol. Further high-quality studies are needed involving larger numbers of patients, indicating how many sessions are needed and how often, and with a follow-up of at least 2 years. This research should also address outcomes such as pain, function, and quality of life, and also which groups of patients—such as patients with sacroiliac pain or discogenic pain—respond better. There should also be an analysis that compares the effects of acupuncture with other evidence-based modalities of treatment.

Sacroiliac Joint Dysfunction

Sacroiliac-joint dysfunction deserves special consideration. The 3 illustrative cases were treated by the current author in 2020. They had different presentations—sciatica, hip pain, and groin pain with X-ray features supporting a disc lesion, spinal-canal stenosis, and, in the case of hip pain, trochanteric bursitis. All of these patients had years of treatment guided by the X-ray findings. One common feature in all 3 cases was the presence of tenderness in the S-1 joint with no X-ray evidence of an S-1 joint lesion; yet, treatment directed to the S-1 joint resulted in near total pain relief. S-1 joint dysfunction masquerading as pain in the hip and thigh, pain in the groin, LBP and pain in the posterior thigh and leg should be looked for and treated.

Many conditions can affect the S-1 joint, including inflammation, degeneration trauma, infection, cancer, and sacroiliac-joint syndrome (which is idiopathic with no demonstrable pathology).[47] Of all LBP, 15%–20% originates in the S-1 joint but, in an acupuncture practice such as that of the current author, the incidence is much higher as most patents turn to acupuncturists after repeated failed mainstream biomedical treatments, as in the 3 illustrated cases.

Pain referred from the sacroiliac joint usually originates in the posterior ligamentous region.[48] Dysfunctional upper sections of the S-1 joint are associated with pain in the upper buttock, and dysfunctional lower sections are associated with pain in the lower buttock. Groin pain is usually referred from

the upper S-1 joint sections.[48] Sacroiliac ligaments are developed at the proximal extent of the first and second sacral segments, and the pain referred from these ligaments occurs in exactly the same way as it is referred from the first and second sacral nerve roots.[49] There is nothing in the nature and extent of the pain to distinguish sacroiliac dysfunction from a disc protrusion compressing either of their nerve roots.[49] This deceptive feature has led to many patients being treated on the assumption that a disc lesion was present. It is the author's practice to check for tenderness over the sacroiliac joint in every case of LBP and, if tenderness is present, then to inject a local anesthetic over the tender spot deeply enough to reach the S-1 ligament and look for relief of pain. If the pain is relieved, it is assumed that there is S-1 joint dysfunction contributing to the pain and the patient is treated in the same way as described in the treatment section with an additional *AhShi* point over the S-1 joint, which is needled to pierce the sacrospinalis muscle, then the posterior sacroiliac ligament to the level of the S-1 joint. The needle should be adjusted to produce the De Qi sensation, and that sensation is often volunteered by the patient.

CONCLUSIONS

At present, there is no proven effective conservative monotherapy for chronic LBP that could be called the therapy of choice. Acupuncture is effective, has an excellent safety profile, is cost-effective, and is superior to usual conservative medical care and sham acupuncture, but with the current level of evidence, acupuncture can best be regarded as an optional mode of therapy. To be elevated to the level of the therapy of choice for which it has the potential, it would need further high-quality, double-blinded clinical trials involving large numbers of patients, and, given that LBP is usually caused by a chronic condition, the treatment would also need long-term follow-up.

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Address correspondence to:
Poovadan Sudhakaran, MBBS, PhD, MastACU, MastTCM
26 Tuckers Road
Templestowe, 3106 Victoria
Australia

E-mail: dr.p.sudhakaran@gmail.com