


FULL PAPER

Evaluation and comparison of the effectiveness of epidural injection and acupuncture in patients with failed back surgery syndrome referred to Baqiyatallah Clinic in 2021

Seyed Ebrahim Hashemi^a | Seyed Yaser Hariri^{b,*} | Ali Ghanjal^c  | Farid Abolhasan Gharedaghi^d| Hamid Hesarikia^e 

^aExercise Physiology Research Center, Lifestyle Institute, Baqiyatallah University of Medical Sciences, Tehran, Iran

^bMD, Physical Medicine and Rehabilitation Specialist, Graduated from Baqiyatallah University of Medical Sciences, Tehran, Iran

^cHealth Management Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran

^dPain Fellowship Anesthesiologist & Critical Care

^eOrthopedic Surgeon, specialty of the Spine, Baqiyatallah University of Medical Sciences, Tehran, Iran

This study aimed to assess and compare the efficacy of epidural injection with acupuncture in patients with lumbar surgical failure syndrome referred to the Baqiyatallah clinic in 2021. Fifty patients with FBSS sent to the Baqiyatallah Hospital clinic for lumbar spinal cord surgery were randomly divided into two groups: Acupuncture was used on the first group. Patients in the second group received epidural injections. One, and three months after, the pain was evaluated and documented using visual analog scale criteria, and quality of life was assessed using the SF-36 questionnaire. One month after, the rate of pain reduction was more significant in the epidural injection group than before the intervention, and pain intensity dropped significantly more than in the acupuncture group ($P=0.014$). The epidural injection group had a higher rate of pain reduction three months after the intervention than one month after. The pain intensity was lower than the acupuncture group. However, the difference was insignificant ($P=0.711$). Before surgery, there was no significant difference in the two groups' quality of life ($P=0.607$). 3 months after surgery, there was no significant difference between patients' quality in the two groups ($P=0.157$). Patients' quality of life 3 months after the intervention was statistically significant ($P=0.001$) in the epidural and acupuncture groups compared to before the intervention ($P=0.001$). Patients with FBSS benefit from epidural injections and acupuncture for pain reduction and improved quality of life.

***Corresponding Author:**

Seyed Yaser Hariri

Email: Drsina8@gmail.com

Tel.: N/A

KEYWORDS

Acupuncture; epidural injection; failed back surgery syndrome; pain.

Introduction

Failed back surgery syndrome (FBSS) is challenging to treat successfully due to a lack of a defined etiology and the complexity of its clinical presentation [1-5], as well as the lack of a standard gold therapy or one-size-fits-all solution [6] and the scarcity of clinical guidance [7]. The diagnosis of this condition

is based on the patient's medical history and a thorough evaluation with contrast MRI. One of the most critical aspects of patient care following back surgery is pain control. Treatments for FBSS include both pharmacological and non-pharmacological options [8]. Acupuncture is commonly used for non-pharmacological pain management [9]. Numerous studies have shown

Acupuncture to be a safe and cost-effective alternative to traditional treatments [10-12]. The primary purpose of acupuncture in lumbar surgery patients is to relieve pain. In recent years, studies on the use of acupuncture in the treatment of FBSS have been done [13].

Even though several studies on the usefulness of acupuncture in FBSS patients been conducted, many of these clinical trials have employed sham needles for the control group, which is unethical and a reality. Clinical cases are unavailable because they are too far away to be employed in practice. On the other hand, studies have identified many acupuncture spots for therapy. This issue illustrates the unique acupuncture used in each clinical study, emphasizing the necessity for further research in this sector in our nation [14-16]. Manchikanti *et al.* compared the effects of lidocaine and steroid epidural injections in 2008 research. This research included 84 patients with disc herniation divided into two groups: epidural lidocaine injections and epidural lidocaine injections plus steroids. This trial revealed that 79 % of patients in the first group and 81 percent of patients in the second group saw pain reductions of more than 50 % over 12 months. Finally, this study found that both injection strategies offer long-term pain management benefits [17]. A systematic study assessed the effects of epidural injections with and without steroids on persistent back pain. Disc herniation, FBSS, spinal canal stenosis, and persistent discogenic pain were among the patients in this research. This study included three FBSS-related clinical studies. These studies revealed that epidural steroid injection is a highly effective treatment for persistent pain in these individuals [18]. Despite the rising number of back pain cases in Iran and the resulting increase in spinal cord surgery, no research on the usefulness of acupuncture or epidural injections in relieving pain in FBSS patients has been undertaken. The goal of this

study was to see if epidural injection and acupuncture were useful in patients with FBSS who were referred to the Baqiyatallah clinic in 2021.

Materials and methods

The plan covered patients referred to the Baqiyatallah Hospital clinic who had lumbar spine surgery and were diagnosed with FBSS. Based on the Demorgan table, we examined 20 people for each group with a probability of 25 people and a total of 50 people for the two variables of pain intensity and quality of life.

Study participants and interventions

FBSS was diagnosed in patients who had lumbosacral spine surgery for various reasons, including discopathy and stenosis. A history, clinical examination, and, if necessary, an MRI or CT scan were used to diagnose FBSS. Nerve and muscle strips were conducted on patients with neuropathy, plexopathy, neck radiculopathy, upper motor neuron involvement, bleeding problems, anticoagulant usage, fever, systemic or local infection, sensitivity to epidural medications, and the use of anticoagulants. Pregnancy and lactation, heart disease, uncontrolled diabetes, and a phobia of needles and injections were all ruled out. The participants in the trial were then separated into two groups: those who received acupuncture and those who received epidural injections. Ten acupuncture sessions were conducted in one group, while two sessions of epidural corticosteroid injection were performed in the other [19-21].

Ten sessions of treatment, including two sessions per week and 30 min each session. Acupuncture points: UB36, 40, 57, 60, and 2 cm lateral distance to the spinus processing nut S1-L1. Depth of needles 1 to 1.5 cm.

In epidural injection method

Treatment consisted of two sessions, once every two weeks.

Drugs used: Triamcinolone 40 to 80 mg, bupivacaine 5% (3 to 5 cc), serum hypersaline 15 cc, an ampoule of hyalase 1, and IU 1500. Treatment included injection of the above substances into the epidural space and with APPROCH Kudal under the guidance of C-ARM by a physician specializing in physical medicine [22].

Measuring outcomes

The pain intensity was measured using a visual analog scale as the study's primary outcome (VAS). Patients were assessed for pain before and after the intervention for one month and three months, respectively. Patients' quality of life was a secondary outcome. The SF-36 quality of life questionnaire was used to measure patients' quality of life before and three months after the intervention [23].

Statistical analysis

The patients' background data was first presented descriptively using dispersion,

central, and frequency indices. The qualitative factors in the two groups were compared using the Chi-square test. According to the normal distribution of data, an independent t-test was employed to compare quantitative variables in the two groups. According to the data distribution, a paired t-test was employed to compare the variables in each group before and after the intervention. Finally, the confidence level was 95% in the computations, and the significant limit was 0.05. SPSS software version 16 and relevant tests were used to analyze the data. Acupuncture is conducted using a 25 * 25 needle after disinfecting the appropriate spots with 96 % alcohol. After half an hour, the needle is withdrawn, and the desired location is washed with alcohol. A physical therapist was in charge of the treatment [24].

Results

Descriptive features: The epidural injection group had 25 patients, whereas the acupuncture group included 25. Table 1 summarizes the descriptive features of the two research groups and compares demographic parameters and clinical history.

TABLE 1 Descriptive characteristics and comparison of demographic characteristics and patients' clinical history in the study groups

P_Value	Group		Property
	Acupuncture	Epidural injection	
0.209	60.16±7.95	57.2±8.47	Age Mean±STD
1	18 (72%)	18 (72%)	Gender Male
	7 (28%)	7 (28%)	Female
0.785	14 (58%)	15 (60%)	Level of Education High school
	9 (36%)	7 (28%)	Diploma
	2 (8%)	3 (12%)	University
0.715	11 (44%)	14 (58%)	Employment status Employed
	1 (4%)	1 (4%)	Unemployed
	6 (24%)	3 (12%)	Retired
	7 (28%)	7 (28%)	Housewife

0.326	4 (16%)	2 (8%)	Pain release pattern
	14 (56%)	19 (76%)	An lower limb
	7 (28%)	4 (16%)	Two lower limbs
0.568	0 (0%)	1 (4%)	No lower limb release
	21 (84%)	22 (88%)	Type of surgery
	1 (4%)	1 (4%)	Discectomy
	3 (12%)	1 (4%)	Laminectomy
			Laminectomy and Discectomy
0.838	9 (36%)	11 (44%)	Fusion
	14 (56%)	12 (48%)	Duration of surgery
	2 (8%)	2 (8%)	3 months
			6 months
0.196	4 (16%)	9 (36%)	One year
	21 (84%)	16 (64%)	Treatments received since the onset of symptoms
			Drug
0.747	6 (24%)	7 (28%)	PT+Drug
	19 (76%)	18 (72%)	Triggerpoint in muscles?
			Yes
0.747	6 (24%)	7 (28%)	No
	19 (76%)	18 (72%)	Psychological disorder
			Depression
0.326	4 (16%)	2 (8%)	Anxiety
	14 (56%)	19 (76%)	EDX result
	7 (28%)	4 (16%)	Involvement of a nerve root
			Multiple nerve root involvement
			Spinal stenosis

Standard deviation (STD)

There was no significant difference in the study group ($P < 0.05$) between age, gender, education level, employment status, pain propagation pattern, type of surgery, duration of surgery, symptoms received since

the onset of symptoms, a trigger point in muscles, psychological disorder, and Electro Diagnostic (EDX) outcome of patients.

Determining and comparing changes in patients' pain

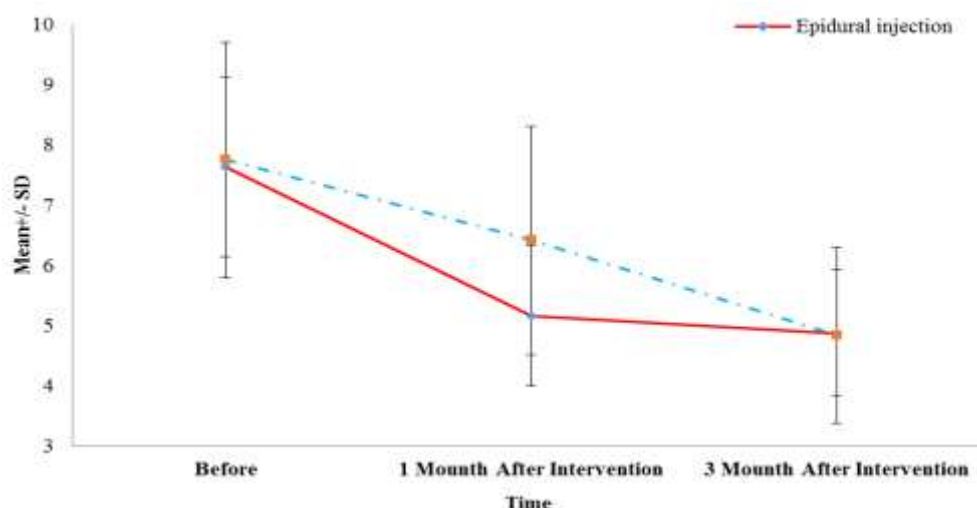


FIGURE 1 Graph of mean pain of patients in the 2 groups studied before, 1 and 3 months after the intervention

Based on the results of Figure 1, in comparison between groups, it was found that there was no significant difference between patients' pain in the two groups ($P = 0.905$). At 1 month after the intervention, patients' pain level in the epidural injection

group was less than the acupuncture group and was significant ($P = 0.014$). At 3 months after the intervention, there was no significant difference between the patients' pain in the two groups ($P = 0.711$).

TABLE 2 Comparison of the difference of pain

P_value	Group		Measurement time
	Acupuncture Mean±STD	Epidural Injection Mean±STD	
0.043	1.34±2.19	2.48±1.26	Difference before and 1 month after intervention
0.254	1.78±1.28	1.98±0.98	The difference is 1 month and 3 months after the intervention
0.00	5.92±2.21	2.38±1.58	Difference before and 3 months after intervention

Standard deviation (STD)

Based on the results of table 2, in-group comparison, it was observed that in both the epidural injection group and acupuncture group, the rate of pain reduction in patients 1 month after the intervention compared to before the intervention was statistically significant ($P = 0.043$). The reduction in pain experienced by patients three months following the intervention was statistically significant ($P = 0.00$). The difference between 3 months after the intervention and 1 month

after the intervention in pain reduction was not statistically significant ($P = 0.254$). The rate of pain reduction in the epidural injection group was more successful one month after the intervention than before the intervention, and the pain intensity was considerably lower than in the acupuncture group ($P < 0.05$). The rate of pain reduction was more effective 3 months after the intervention than one month after the intervention in the epidural injection group.

The pain intensity was lower than the acupuncture group but was not significant ($P < 0.05$) [25].

Comparison of changes in quality of life

TABLE 3 Comparison of changes in quality of life in patients in the two study groups before and 3 months after the intervention

P ₁ _value	Group		Measurement time	Area
	Acupuncture Mean±STD	Epidural Injection Mean±STD		
0.591	51.2±24.03	46.4±32.54	Before intervention	Physical function
0.812	84.4±15.89	84.6±15.67	3 months after intervention	
	<0.001	<0.001	P ₂ _value	
0.991	24±38.51	24±37.13	Before intervention	Physical problems
0.072	78.6±22.13	78.6±21.43	3 months after intervention	
	<0.001	<0.001	P ₂ _value	
0.785	50.16±25.08	47.56±23.26	Before intervention	Physical pain
0.465	80.88±12.91	78.32±15.25	3 months after intervention	
	<0.001	<0.001	P ₂ _value	
0.468	59.6±20.5	55.44±19.72	Before intervention	General health
0.122	75.44±19.27	69.24±16.95	3 months after intervention	
	<0.001	<0.001	P ₂ _value	
0.87	53.2±18.47	54±15.81	Before intervention	Cheerfulness
0.667	65.6±18.04	65±13.22	3 months after intervention	
	<0.001	<0.001	P ₂ _value	
0.135	63.28±18.15	56.24±22.55	Before intervention	Social Performance
0.296	76.28±18.05	69.24±21.98	3 months after intervention	
	0.001	<0.001	P ₂ _value	
0.192	53.32±48.12	37.36±47.47	Before intervention	Mental problems
0.117	86.64±31.96	75.92±34.25	3 months after intervention	
	0.022	<0.001	P ₂ _value	
0.256	54.56±16.72	60.64±20.51	Before intervention	Mental health
0.075	75.2±17.24	67.12±17.9	3 months after intervention	
	<0.001	<0.001	P ₂ _value	

Standard deviation (STD)

According to the findings of Table 3, there was no significant difference ($P < 0.05$) between the two groups in terms of quality of life, including physical function, physical issues, physical pain, general health, vitality, social

function, mental difficulties, and mental health before surgery. There was no significant difference in the quality of life between the two research groups three months after surgery in physical function,

physical issues, physical pain, general health, vitality, social function, mental problems, and mental health ($0.05 < P$). The quality-of-life dimensions of physical function, physical difficulties, physical pain, general health, vitality, social function, mental issues, and

mental health of patients in both epidural injection and acupuncture groups were similar in both groups. Compared to the month before the intervention, the month following the intervention was statistically significant ($P = 0.00$) [26].

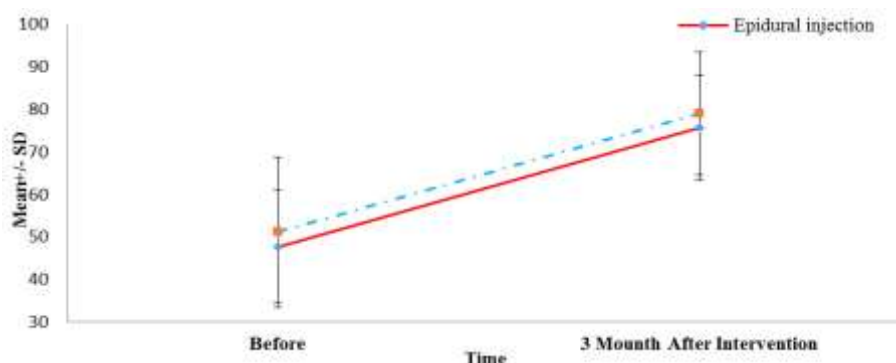


FIGURE 2 Graph of the average quality of life of patients in the two groups during and before 3 months after the intervention

Based on the results of Figure 2, in the comparison between groups, it was found that before surgery, there was no significant difference between the quality of life of

patients in the two groups ($P < 0.05$). At 3 months after surgery, there was no significant difference between patients' quality of life in the two groups ($P < 0.05$).

TABLE 4 Comparison of changes in quality of life in patients of the two study groups before and 3 months after the intervention

P ₁ _value	Group		Measurement time
	Acupuncture Mean±STD	Epidural Injection Mean±STD	
0.9	79±14.44	75.72±12.33	The difference before and 3 months after the intervention

Standard deviation (STD)

According to Table 4, the rate of increase in quality of life 3 months after the intervention compared to before the intervention in the epidural injection group had a more significant effect than the

acupuncture group. However, this rate was not significant ($P < 0.05$).

Comparison of the effect of age on the effectiveness of epidural injection and acupuncture in patients

TABLE 5 Comparison of changes in patients' pain in the two groups during 1 month and 3 months after the intervention according to age

P_value	Group		Measurement time	Age
	Acupuncture Mean±STD	Epidural Injection Mean±STD		
0.297	8.16±1.94	7.42±1.34	Before intervention	>60
0.16	6.2±2.23	4.92±1.07	1 month after intervention	
0.403	4.41±1.5	4.71±1.13	3 months after intervention	
0.631	1.95±2.37	2.5±1.28	Difference before and 1 month after intervention	60=<
0.183	1.79±1.26	1.61±0.89	Difference 1 month and 3 months after intervention	
0.459	7.38±1.98	7.9±1.7	Before intervention	
0.082	6.61±1.6	5.45±1.29	1 month after intervention	60=<
0.865	5.23±1.36	5.09±0.94	3 months after intervention	
0.194	2.76±1.92	2.45±1.29	Difference before and 1 month after intervention	
0.121	1.38±1.32	1.36±1.02	Difference 1 month and 3 months after intervention	

Standard deviation (STD)

According to the results of Table 5, age did not affect the effectiveness of epidural injection and acupuncture, and patient pain relief ($P > 0.05$).

TABLE 6 Comparison of changes in quality of life in patients of the two study groups before and 3 months after the intervention according to age

P_value	Group		Measurement time	Age
	Acupuncture Mean±STD	Epidural Injection Mean±STD		
0.781	51.89±19.66	46.04±12.29	Before intervention	>60
0.403	81.47±12.71	78.07±13.12	3 months after intervention	
0.494	29.58±18.12	32.02±22.46	Difference before and 3 months after intervention	
0.776	50.49±16.48	49.81±14.7	Before intervention	<=60
0.331	76.72±16.03	72.72±11.10	3 months after intervention	
0.459	26.23±21.31	22.9±14.55	Difference before and 3 months after intervention	

Standard deviation (STD)

According to the results of Table 6, age did not affect the effectiveness of epidural and acupuncture injection methods and patients' quality of life [27].

Comparison of the effect of gender on the effectiveness of epidural injection and acupuncture in patients:

TABLE 7 Comparison of changes in patients' pain in the two groups during, before, 1 month, and 3 months after intervention by gender

P_value	Group		Measurement time	Gender
	Acupuncture Mean±STD	Epidural Injection Mean±STD		
0.767	7.55±1.88	7.66±1.53	Before intervention	Male
0.091	6.13±1.76	5.16±1.29	1 month after intervention	
0.696	4.66±1.32	4.77±1.06	3 months after intervention	
0.181	1.41±2.49	2.5±1.24	Difference before and 1 month after intervention	
0.098	1.47±0.97	1.38±0.97	Difference 1 month and 3 months after intervention	
0.535	8.28±2.21	7.57±1.51	Before intervention	
0.097	7.14±2.19	5.14±0.89	1 month after intervention	Female
1	5.28±1.79	5.14±1.06	3 months after intervention	
0.165	1.14±1.21	2.42±1.39	Difference before and 1 month after intervention	
0.089	1.85±1.95	1.08±0.81	Difference 1 month and 3 months after intervention	

Standard deviation (STD)

According to the results of Table 7, gender did not affect the difference between 1 month and 3 months after the intervention, the

effectiveness of epidural injection and acupuncture on patients' pain ($P > 0.05$).

TABLE 8 Comparison of changes in quality of life in patients of the two study groups before and 3 months after intervention by gender

P_value	Group		Measurement time	Gender
	Acupuncture Mean±STD	Epidural Injection Mean±STD		
0.743	53.64±18.7	49.43±14.66	Before intervention	Male
0.239	79.18±15.02	76.87±12.21	3 months after intervention	
0.628	25.53±20.62	27.44±21.1	Difference before and 3 months after intervention	
0.62	44.78±14.02	43.26±7.82	Before intervention	Female
0.535	78.55±13.95	72.75±13.07	3 months after intervention	
0.62	33.76±16.14	29.48±16.33	Difference before and 3 months after intervention	

Standard deviation (STD)

According to the results of Table 8, gender has not been effective in the effectiveness of epidural injections and acupuncture in improving patients' quality of life [28].

Discussion

The study's findings were based on age, gender, education level, job status, pain pattern, kind of operation, length of time after

surgery, therapies received since the beginning of symptoms, a trigger point in muscles, psychiatric problem, and EDX result in patients undergoing surgery. Between the two groups, there was no discernible difference [29]. As a result, the two groups studied are comparable in terms of age, gender, education level, employment status, pain pattern, type of surgery, duration of surgery, treatments received since the onset of symptoms, trigger points in muscles, psychological disorders, and EDX results, and these variables cannot act as confounders on other variables [30]. According to the study's most crucial findings, there was no significant difference in pain between the two groups before the intervention. The epidural injection group saw a considerable reduction in pain one month following the intervention compared to the acupuncture group. There was no significant difference in the rate of pain decreased in the two groups three months following the intervention [31]. In an intra-group comparison, it was discovered that the rate of pain reduction in patients 1 month after the intervention compared to before the intervention was statistically significant in both the epidural injection and acupuncture groups [32]. The reduction in pain experienced by patients three months

after the intervention was statistically significant compared to before and one month after the intervention [33]. In the epidural injection group, the rate of pain reduction was significantly higher one month after the intervention than before the intervention compared to the acupuncture group [34]. The rate of pain reduction in the epidural injection group was greater 3 months after the intervention than one month after the intervention compared to the acupuncture group, but the difference was not significant. According to the comparison between groups, there was no significant difference in patients' quality of life in the two groups before surgery and 3 months after surgery [35]. In an intra-group comparison, it was discovered that patients' quality of life 3 months after the intervention compared to before the intervention was statistically significant in both the epidural injection and acupuncture groups [36]. As a result, it appears that both epidural injection and acupuncture are beneficial in relieving pain and enhancing the quality of life in FBSS patients. The scientific proof for transforaminal epidural steroid injections for lumbar nerve root pain was robust for both short- and long-term relief through various mechanisms [15] Figure 3 [37-39].

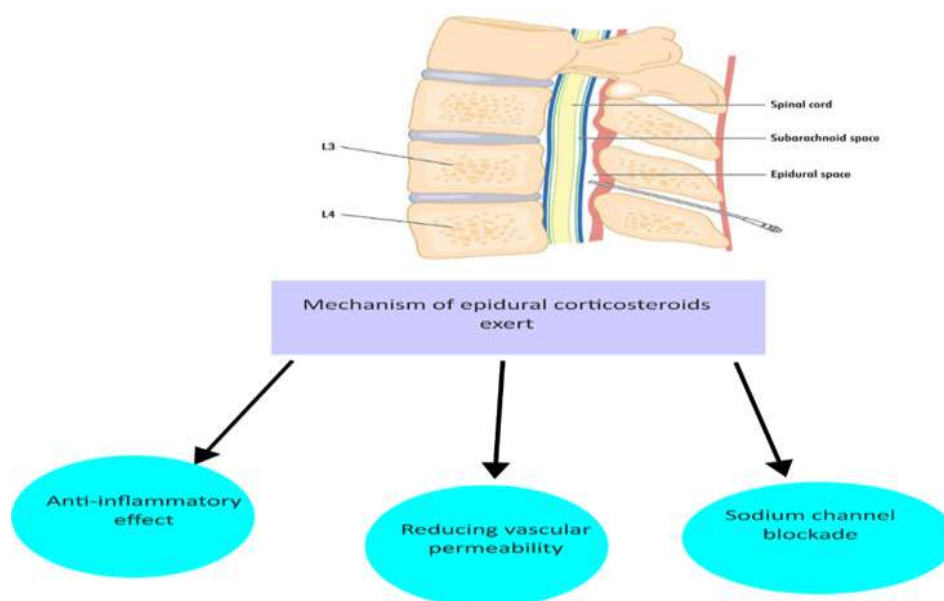


FIGURE 3 Epidural injection of corticosteroid

Yeh *et al.*, used acupuncture of electrical stimulation points (AES) in relieving pain in patients following spinal cord surgery. They discovered that pain and dependency on analgesics in patients treated with medication Needles were greatly reduced, similar to the current study. Finally, this acupuncture study was suggested as a safe and effective way to alleviate pain following spinal cord surgery [39]. Cho *et al.* discovered that patients treated with acupuncture experienced much less pain during the first 24 h following surgery than those treated with sham acupuncture. According to the authors, acupuncture is useful in alleviating pain following low back surgery. However, the data in this area is poor, and further research is required. In addition, according to the findings of this study, pain in the acupuncture group was dramatically reduced one month following surgery compared to the control group. However, one week and three months following surgery, the level of discomfort experienced by the two groups differed. It was utterly meaningless. According to one study, acupuncture is an effective, easy, and safe therapy for lowering pain in individuals having lumbar disc herniation surgery.

Conclusion

According to the current study's findings, an epidural steroid injection is quite helpful in alleviating chronic pain experienced by these individuals. Separate retrospective research found that following transforaminal epidural steroid injections, 26.8% of patients with chronic radicular pain after back surgery experienced at least 50% pain reduction (ESIs). In individuals with recurrent disc herniation, this percentage jumped to 43%. Patients with FBSS from at least two prior operations for lumbar disc herniation who got Gabapentin in addition to ESI had significantly reduced pain levels at 1 and 3 months compared to those who received ESI

while taking naproxen sodium, tizanidine, and vitamin B and C complex. This study was an interventional study comparing two short-term therapies, and no other study like it had been done before. According to the findings of this study, both epidural injection and acupuncture are beneficial in relieving pain and increasing quality of life in patients with Failed Back Surgery Syndrome. More follow-up and a larger sample size are required to track its long-term effects. In individuals with high blood pressure, diabetes, heart disease, and other disorders that limit steroid usage, acupuncture is indicated to help treat and manage the symptoms of FBSS.

Acknowledgements

We would like to thank all the people who helped in preparing and compiling the article and collecting the available data.

Orcid:

Ali Ghanjal: <https://orcid.org/0000-0003-2284-5285>

Hamid Hesarikia: <https://orcid.org/0000-0001-8681-8003>

References

- [1] P. Rigoard, M. Desai, R.S. Taylor, *Neurochirurgie*, **2015**, *61*, S16-S21. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [2] S. Blond, P. Mertens, R. David, M. Roulaud, P. Rigoard, *Neurochirurgie*, **2015**, *61*, S45-S56. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [3] S.R. Anderson, *Curr. Rev. Pain*, **2000**, *4*, 395-406. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [4] A. Al Kaisy, D. Pang, M.J. Desai, P. Pries, R. North, R.S. Taylor, L. Mc Cracken, P. Rigoard, *Neurochirurgie*, **2015**, *61*, S6-S14. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [5] K. Gatzinsky, S. Eldabe, J.P. Deneville, W. Duyvendak, N. Naiditch, J.P. Van Buyten, P. Rigoard, *Pain Res. Manag.*, **2019**, *2019*, Article

- ID 8184592. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [6] M.J. Desai, A. Nava, P. Rigoard, B. Shah, R.S. Taylor, *Neurochirurgie*, **2015**, *61*, S66-S76. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [7] R.B. North, J.N. Campbell, C.S. James, M.K. Conover-Walker, H. Wang, S. Piantadosi, J.D. Rybock, D.M. Long, *Neurosurgery*, **1991**, *28*, 685-691. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [8] R.W. Hutchison, E.H. Chon, W.F. Tucker Jr, R. Gilder, J. Moss, P. Daniel, *Hosp. Pharm.*, **2006**, *41*, 659-663. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [9] R.R. Wang, V. Tronnier, *Am. J. Chinese Med.*, **2000**, *28*, 25-33. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [10] Y.C. Chen, C.Y. Lee, S.J. Chen, *Cell Transplant.*, **2019**, *28*, 239-247. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [11] A.J. Vickers, A.M. Cronin, A.C. Maschino, G. Lewith, H. MacPherson, N.E. Foster, K.J. Sherman, C.M. Witt, K. Linde, *Arch. Intern. Med.*, **2012**, *172*, 1444-1453. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [12] J.S. Shin, I.H. Ha, J. Lee, Y. Choi, M.R. Kim, B.Y. Park, B.C. Shin, M.S. Lee, *PAIN®*, **2013**, *154*, 1030-1037. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [13] G. Byröd, K. Otani, H. Brisby, B. Rydevik, K. Olmarker, *J. Orthop. Res.*, **2000**, *18*, 983-987. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [14] M.L. Yeh, Y.C. Chung, K.M. Chen, H.H. Chen, *Int. J. Nurs. Stud.*, **2011**, *48*, 703-709. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [15] Y.H. Cho, C.K. Kim, K.H. Heo, M.S. Lee, I.H. Ha, D.W. Son, B.K. Choi, G.S. Song, B.C. Shin, *Pain Pract.*, **2015**, *15*, 279-291. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [16] M.C. Bicket, J.M. Horowitz, H.T. Benzon, S.P. Cohen, *Spine J.*, **2015**, *15*, 348-362. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [17] AM. Milani Fard, M. Milani Fard, *Eurasian J. Sci. Technol.*, **2022**, *2*, 14-31. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [18] S. Saedi, A. Saedi, M.M. Ghaemi, M. Milani Fard, *Eurasian J. Sci. Technol.*, **2022**, *2*, 233-241. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [19] M. Mokhtare, R. Alimoradzadeh, S. Agah, H. Mirmiranpour, N. Khodabandehloo, *Middle East J Dig Dis*, **2017**, *9*, 228-234. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [20] R. Alimoradzadeh, H. Mirmiranpour, P. Hashemi, S. Pezeshki, S.S. Salehi, *Journal of Neurology & Neurophysiology*, **2019**, *10*, 1. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [21] R. Alimoradzadeh, M.A. Abbasi, F. Zabihi, H. Mirmiranpour, *Iran. J. Ageing*, **2021**, *15*, 524-533. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [22] M.B. Abhari, P.F. Afshar, R. Alimoradzadeh, H. Mirmiranpour, *Immunopathologia Persa*, **2019**, *6*, e10. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [23] Z. Cheng, Y. Lu, Q. Cao, L. Qin, Z. Pan, F. Yan, W. Yang, *Am. J. Roentgenol.*, **2020**, *215*, 121-126. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [24] W. Alsharif, A. Qurashi, *Radiography*, **2020**, *27*, 682-687. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [25] Y. Raziani, B.S. Othman, *Veins & Lymphatics*, **2021**, *10*, 5-10. [[Google Scholar](#)], [[Publisher](#)]
- [26] S. Ghorbanizadeh, Y. Raziani, M. Amraei, M. Heydarian, *J. Pharm. Negative Results*, **2021**, *12*, 54-58. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [27] Y. Raziani, B.S. Othman, S. Raziani, *Ann. Med. Surg. (Lond)*, **2021**, *69*, 102739. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [28] Y. Raziani, S. Raziani, *J. Chem. Rev.*, **2021**, *3*, 83-96. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [29] A. Susanabadi, S. Etemadi, M.S. Sadri, B. Mahmoodiyeh, H. Taleby, M. Milani Fard, *Ann. Rom. Soc. Cell Biol.*, **2021**, *25*, 2875-2887. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [30] F.E. Sadr, Z. Abadi, N.E. Sadr, M. Milani Fard, *Ann. Rom. Soc. Cell Biol.*, **2021**, *25*, 6839-6852. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [31] K. Ghajarzadeh, M. Milani Fard, H. Alizadeh Otaghvar, S.H.R. Faiz, A. Dabbagh, M. Mohseni, S.S. Kashani, A.M. Milani Fard, M.R. Alebouyeh, *Ann. Rom. Soc. Cell Biol.*,

2021, 25, 2457-2465. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]

[32] K. Ghajarzadeh, M. Milani Fard, H. Alizadeh Otaghvar, S.H.R. Faiz, A. Dabbagh, M. Mohseni, S.S. Kashani, A.M. Milani Fard, M.R. Alebouyeh, *Ann. Rom. Soc. Cell Biol.*, **2021**, 25, 2449-2456. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]

[33] K. Ghajarzadeh, M. Milani Fard, M.R. Alebouyeh, H. Alizadeh Otaghvar, A. Dabbagh, M. Mohseni, S.S. Kashani, A.M. Milani Fard, S.H.R. Faiz, *Ann. Rom. Soc. Cell Biol.*, **2021**, 25, 2466-2484. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]

[34] R. Alimoradzadeh, H. Mirmiranpour, P. Hashemi, S. Pezeshki, S.S. Salehi, *J. Neurology Neurophys.*, **2019**, 10, 1000483. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]

[35] R. Alimoradzadeh, M. Mokhtare, S. Agah, *Iran. J. Age.*, **2017**, 12, 78-89. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]

[36] S. Etemadi, B. Mahmoodiyeh, S. Rajabi, A. Kamali, M. Milani Fard, *Ann. Romanian Soc. Cell Biol.*, **2021**, 25, 2417-2426. [[Pdf](#)] [[Google Scholar](#)], [[Publisher](#)]

[37] S. Saedi, A. Saedi, M.M. Ghaemi, M. Milani Fard, *Eurasian J. Sci. Technol.*, **2021**, 2, 185-196. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]

[38] A. Firoozfar, M. Dousti, *Mag. Civ. Eng.*, **2019**, 90, 119-129. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]

[39] M. Dousti, A. Firoozfar, *J. Eng. Ind. Res.*, **2022**; 3, 54-68. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]

How to cite this article: Seyed Ebrahim Hashemi, Seyed Yaser Hariri*, Ali Ghanjal, Farid Abolhasan Gharedaghi, Hamid Hesarikia. Evaluation and Comparison of the Effectiveness of Epidural Injection and Acupuncture in Patients with Failed Back Surgery Syndrome Referred to Baqiyatallah Clinic in 2021. *Eurasian Chemical Communications*, 2022, 4(4), 347-359. **Link:** http://www.echemcom.com/article_145174.html