



The Relationship between Dorsal Spine Dysfunction and Gastrointestinal Pain and the Efficacy of Manipulation on Them

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Keywords

Gastrointestinal pain; Spine; Dysfunction; Manipulation therapy

Abstract

Background: The goal of this study was to check the exact relationship between gastrointestinal (GI) pain and dorsal spine dysfunction.

Methods: This was a case-control study. 62 patients without underlying GI problems were divided into two groups. The first group included patients with minor intervertebral dysfunction (MID+) and the second group had no MID. Spinal manipulation was performed for patients with MID and for the MID- group. The rate of recovery of GI symptoms was compared before and after the manipulation between the two groups.

Results: After the first session of manipulation, the decrease in pain intensity in the MID+ group was more than the MID- group ($P < 0.001$). After the

second session, the pain intensity in the MID+ group decreased sharply, while no significant decrease was recorded in the MID- group one and three months after the manipulation. However, after the third manipulation session, the pain increased in the MID+ group; this was also observed one and three months after manipulation ($P = 0.048$).

Conclusion: The results indicate that treatment with manipulation has a temporary effect; it can improve the quality of life along with pain alleviation for at least three months.

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Introduction

Gastrointestinal (GI) symptoms such as



heartburn, indigestion, and bloating are common and widespread, to the extent that around 45% of the general population experience at least one of these symptoms monthly.¹⁻⁵ Chronic abdominal pain is a debilitating problem that leads to reduced quality of life and costly and potentially hazardous medical tests beside imposing a huge burden on the patient and the health system. Despite extensive endoscopic and medical evaluations, the etiology of chronic abdominal pain has often remained unknown and is mostly referred to as psychosomatic or functional GI disease.^{6,7}

The precise diagnosis and treatment of chronic abdominal pain with no specific etiology is often a mutual failure for both the physician and the patient.^{8,9} In addition to the high diagnostic and therapeutic expenses, the indirect costs such as the marginal costs of various treatments, reduced life quality, and the tendency toward surgical treatments must also be taken into account.^{10,11}

Therefore, the development of non-surgical and non-medical treatment protocols, such as physical therapy can offer significant health benefits to a great percentage of such patients and eliminate the high cost of medical treatments. Emerging in 1895, physical medicine claimed to relieve visceral symptoms by using spinal manipulation. The history of spinal manipulation treatment goes back to the Hippocrates and Galen era.¹²

This therapeutic approach has been propounded in more scientific and academic centers in recent years and is termed as "Manipulation" or "Manual Medicine".^{13,14} Unlike treatments such as physiotherapy, this method requires no special equipment and is performed specifically by the doctor's hand.¹³ To date, manual interventions such as spinal manipulation in resolving digestive problems have only been studied in isolated human studies and case reports.¹⁵ As in our practice, we faced several patients with minor spinal intervertebral dysfunction (MID) in addition to GI symptoms who showed good response to spinal manipulation, this study was

designed to investigate the exact correlation between GI pain and spinal MID.

Methods

This case-control study was performed in the GI diseases clinic of Imam Reza Hospital in Tehran, Iran, on 62 patients in the age range of 20-50 years with at least a 12-month history of symptoms such as indigestion, reflux, heartburn, and chronic abdominal pain. The patients were initially fully examined and all kinds of clinical tests including endoscopy, colonoscopy, ultrasound, and laboratory evaluations such as serum amylase, lipase, liver function tests, stool exam, and blood cell count were performed to rule out any possible GI disease for each patient. Individuals under 20 years of age, pregnant women, and patients with contraindications for manipulation were excluded from the study.

The study protocol was verified by the local Ethics Committee of AJA University of Medical Sciences, Tehran, Iran, and agreement was obtained from all participants prior to study entry. In the first visit, demographic data and digestive symptoms and complaints were entered into in a designed questionnaire. Patients without any underlying GI problems (negative paraclinical study) were distributed into two groups. The first group included the patients with MID, whereas the second group did not have MID. Thoracolumbar (TL) junction manipulation is done at T12-L1 level and this is a passive method where the therapist exerts a particularly straight manual force or pressure to a joint, at or close to the end of the passive or physiological range of motion (ROM). This is often accompanied by an audible click. The popular characteristic of spinal manipulation methods is the fact that they make a popping or clicking sound in synovial joints. The reason for this audible propagation is open to several conjectures but it is broadly accepted to show cavitation of a spinal facet joint. When there is a less force than normal in the facet joint, gas bubbles are being organized in the joint. At the moment that the force ascends, the bubbles implode; this is called cavitation.

This maneuver was performed for patients with MID and patients with no MID (as the control group), both three to five times on a weekly basis. The rate of recovery in GI symptoms in the two groups was compared before and after the manipulation.

All patients were examined before and after each manipulation session, as well as on one- and three-month follow-up visits, and their pain intensity was measured using the pain visual analogue scale (VAS). We blinded the study in a way that the therapist who did the check-ups before and after the manipulation was not aware of the patients' group assignment. SPSS software (version 16, SPSS Inc., Chicago, IL, USA) and appropriate statistical tests were used for data analysis; a P-value < 0.05 was weighed by the numbers as remarkable.

Results

A total of 62 patients were studied. The patients' demographic data are presented in table 1.

Table 1. Patients' demographic characteristics

Variable	MID+	MID-	P
Sex (male) [n (%)]	15 (48.4)	15 (48.4)	> 0.999
Age (year) (mean ± SD)	43.84 ± 8.90	53.85 ± 6.10	0.856
BMI (kg/m ²) (mean ± SD)	12.34 ± 1.60	12.28 ± 1.50	

MID: Minor intervertebral dysfunction; BMI: Body Mass Index; SD: Standard deviation

The mean pain intensity for both groups was almost the same at study entrance. All

patients had GI issues such as bloating, constipation, and GI pain. After the first session of manipulation, the decrease in pain intensity in the MID+ group was more than the MID- group (P < 0.001). After the second session, the pain intensity in the MID+ group decreased sharply while no significant decrease was recorded in the MID- group one and three months after the manipulation. However, after the third manipulation session, the pain increased in the MID+ group; this was also observed one and three months after manipulation (P = 0.048) (Table 2).

To assess the level of pain, repeated measures test was used at different time points, indicating a significant difference between the two groups (F = 12.799, P < 0.001) (Figure 1).

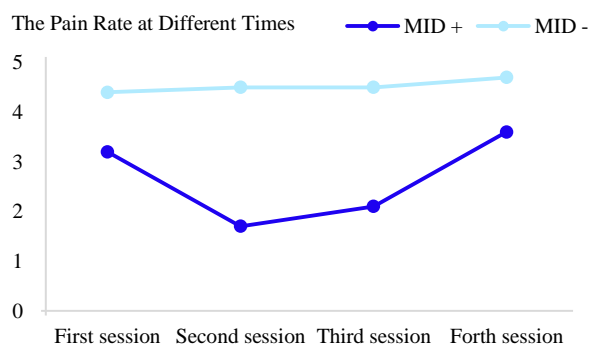


Figure 1. The pain intensity at different studied time points

Discussion

The findings of the present study showed that the use of spinal manipulation in MID+ patients with GI symptoms could remarkably decrease both their digestive symptoms and pain during a period of three months.

Table 2. Comparison of the mean and standard deviation (SD) of pain intensity between the two groups

Sex	n	Mean ± SD	Mean error	P
First session				< 0.001*
MID+	31	3.22 ± 1.05	0.18	
MID-	31	4.38 ± 0.95	0.17	
Second session				< 0.001*
MID+	31	1.80 ± 0.98	0.17	
MID-	31	4.48 ± 0.92	0.16	
Third session				< 0.001*
MID+	31	2.12 ± 1.20	0.21	
MID-	31	4.51 ± 1.02	0.18	
Forth session				0.048*
MID+	31	3.61 ± 1.66	0.29	
MID-	31	4.70 ± 1.21	0.21	

MID: Minor intervertebral dysfunction; SD: Standard deviation

*P-value > 0.05 is significant

Manipulation is a manual treatment that uses different maneuvers and procedures to maintain maximum painless motion of the muscular system in the postural balance.¹⁶ It is a passive motion in which the therapist extends a joint or a group of joints and then imposes a fast movement with a low amplitude and high speed on them.¹⁷ The crucial role of manipulation in improving the symptoms of lumbago and increasing the flexibility of the spine is a priceless tool in leading patients towards following the rehabilitative procedures of lumbago.¹¹ However, the therapeutic mechanism of manipulation is not yet fully understood. Primary theories suggest that the nervous system is its mediator. For instance, in 1975, Pickar and Bolton suggested that spinal manipulation moderated proprioceptive input to the central nervous system (CNS).¹⁸ The facet joint (zygapophyseal joint) is a sinusoidal joint between the upper articular appendix of a vertebra and the bottom articular appendix of the upper vertebra. There are two facets in each spinal motion segment; the biomechanical function of each facet is to lead and limit the spinal motion. Therefore, most spinal pain with different presentations may have a facet joint origin. Along with local pain, the facet joints could have a referred pain in a specific direction. Some of their presentations are in the thoracic and lumbar region appearing as gastric pain.

In Peters et al. study on the treatment of chronic abdominal pain with an unknown origin and the outcome of referral to a chronic abdominal pain center, after a four-year research, it was concluded that when the standard protocol in diagnosing the cause of pain by a gastroenterologist failed, referring the patient to a chronic pain treatment center could have satisfying results in 70% of such cases.¹⁹

These findings are compatible with our results in which the temporary effect of manipulation in pain reversion was revealed after three months.

In another study, Alcantara and Mayer

used spinal manipulation on three infants with constipation three times a week for two months. The outcome of this study showed that this approach was both safe and efficient for the treatment of people with persistent constipation.²⁰ These results which prove bowel movement facilitation with manipulation and constipation treatment are in accordance with our findings indicating a decrease in GI pain with manipulation.

In another study, 83 patients with chronic indigestion and pain in the chest and epigastric area with GI origin were treated with spinal manipulation for two years. Young et al. concluded that patients with chronic idiopathic indigestion might benefit from 3-month supportive manipulation treatment to reduce the severity and frequency of their symptoms.²¹ Our study also showed that with manipulation, gastric and spinal pain can be alleviated or controlled for at least three months.

Nevertheless, in another study, chiropractic therapy resulted in a decrease in pain, an increase in sacroiliac (SI) joint mobility, and maintenance of general functional ability in patients with gait disorder due to SI syndrome.²² The results of our study showed that along with decreasing abdominal pain, manipulation was also effective in decreasing spinal pain.

In the present study, the change in the studied parameters was recorded before and after manipulation, leading to the aforementioned results. Accordingly, selecting a larger study population is recommended in future studies to achieve more precise and generalizable results.

Conclusion

This study showed that manipulation could result in reduced abdominal pain intensity in both the MID+ and MID- groups in comparison to study initiation, with a significantly greater decrease in the MID+ group. However, after three treatment sessions, the pain recurred in the abdominal area and the spine. This indicates that although

manipulation therapy has a temporary effect, it could improve the quality of life and decrease the pain intensity for at least three months.

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Conflict of Interest

Authors have no conflict of interest.

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