

Visceral Manipulation as a management option for low back pain: A randomized control trial

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Abstract— Background: The projected study was want to explore immediate effects of visceral manipulation as treatment option to improve low back pain. It was a participant blinded trial which was directed in order to explore the immediate effects of visceral manipulation on low back pain in comparison with traditional therapeutic exercises. Methodology: 30 female patients with low back pain who presented with complain of low back pain for treatment at tertiary care hospital, were randomized into experimental and control group. Experimental group receives visceral manipulation (n=15), whereas control group receives traditional therapeutic exercises (n=15). Pain was the primary outcome; measured by Numeric Pain Rating Scale while secondary outcome; functional mobility, was measured by the Sitting-Rising Test .Each participant was evaluated before and after the treatment session. Participants were also evaluated the very next day to assess the residual effects. Results: Statistical analysis reveals that visceral manipulation effectively improves the primary outcomes of pain immediately after treatment. Though the immediate effect of visceral manipulation on functional mobility was difficult to assess immediately but slight improvement was seen. Participants were successfully blinded to group status. There were no significant side effects reported in both groups. Conclusions: This study proposes visceral mobilization to be more effective in improving pain immediately in comparison to standard physiotherapy regimen for low back pain management. However, more researches are required to assess the long-term effectiveness of visceral manipulation.

Index Terms— Low back pain, visceral manipulation, physiotherapy, traditional therapeutic exercises, numeric pain rating scale, functional disability, sitting rising test.

1 INTRODUCTION

There is a substantial rise in prevalence of low back pain (LBP) through 30 to 60 years of age (1). Around 70- 80% adults experience low back pain at some time in their lives making it most common musculoskeletal problem(2). It is recognized as one of the common health problems and one of the main reasons for movement limitation and important cause for absenteeism at work consequential resulting in huge socio-economic load on individual, family, society and administration(3).

Classically low back pain is well-defined as soreness, muscle tightness, or toughness limited between lower costal border and lower gluteal folds. However, it can occur with or without radiating leg pain. (4)It is the condition that limits individual activities along with recruiting certain tasks(5).

LBP serves as second utmost common cause for first- contact consultation - Chiropractor, Physiotherapist visit (6) . Other than, using the spinal manipulation(7), these specialists also practice visceral techniques with conventional approach(8).

Although there are multiple studies assessing these treatment options for usefulness and effectiveness. However visceral mobilization is one of those treatment options whose effectiveness is still undefined (9).

LBP results due to multiple cause and arise in different numerous groups of people (10). Variation in visceral flexibility of movement in relation to surrounding connective tissues can cause LBP as it affect the flexibility determining the fact ability to bear up stress and strain (11). Around 80%-90% of dys-functions and pain related to neuromuscular system have visceral origin (12).

Existing research validates that additional years of infirmity are caused by low back pain , other than any health related condition(13). Though osteopaths believe improper urogenital visceral movement is one of the predominant causes of LBP rather than disc pathologies. In spite that mainstream is rarely aware of this fact, until the musculoskeletal involvement(14). The foundation for the use of visceral manipulation techniques is to improve the mobility (15) and function (16) of the viscera by altering their movement.

Visceral Mobilization is a manual technique practiced improving the normal mobility of viscera's in relation to their surrounding tissues by loosen the fascial restrictions between visceral and respective connective tissue (17). Ajimsha et al identified; fascial restriction in one area of body can leads to symptoms appear in distant parts of the body , as a consequence of fascial continuity (18).

Several studies reveal that, the application of Visceral techniques in healthy people leads to an instantaneous rise in pain threshold of LBP (6). The concept is that, the visceral disorders might possibly activate or worsen back pain signs as a result of decreased movement between organs and corresponding supportive connective tissue. Which can result in LBP either through visceral referred pain or through central sensitization (8). Any disruption in fascia can leads to interrupt spinal Column biomechanics leading to myofascial pain decrease blood supply and lymphatic drainage (19,20). Hence according to one of the theories about VM reduces fascial ten-

sion enhancing normal mobility of organs in relation to each other (21).

Although, there is possibility of visceral disorders in developing LBP therefore standard physiotherapy protocol does not target the viscera's directly and the efficacy / effectiveness of VM is uncertain. Therefore, this randomized control trial (RCT) was to inspect the effectiveness of VM vs Standard physiotherapy regimen for management of LBP in order to improve pain immediately.

2 PROCEDURE

Study was single blinded randomized control trial, primarily conducted to play a part in assessing the efficacy of visceral mobilization. The study population was every successive patient who presented with low back pain in tertiary care hospital. Inclusion criteria was patients presenting complain LBP with in age limit 25- 50 years. With no known contraindication to visceral Mobilization, spinal or other oncological pathologies, not pregnant or suspect of pregnancy, not currently on blood thinning agents and with no known or suspect of inflammatory disorders of gastrointestinal tract. Each potential patient meeting inclusion criteria was involved in the study.

Total 48 patients visited tertiary care hospital, out of which 18 were excluded due to not meeting the inclusion criteria. And 30 were found eligible as they met the inclusion criteria. Participant's meeting the inclusion criteria were allocated into experimental and control group by using simple randomization technique. Written consent was obtained from the participating subjects. Procedure was explained to the participants of both groups.

Demographic data and basic subjective information were documented. Other than standard assessment participants were also assessed for visceral mobility. Participants receive treatment respective of their groups and stay blinded. The participants of control group will receive standard physiotherapy regimen whereas experimental group will receive visceral manipulation as a management strategy. Treatment session for both groups last for 30 min.

Experimental Group: The participants were treated by using visceral manipulation (VM) which is mild and soft manual therapy technique used to assess and treat physiological movement disorders related to internal organ mobility restrictions.(22)

Control Group: Participants were treated with traditional therapeutic exercises (Hot pack, Ultrasound therapy and strengthening exercise). (23)

Initially the baseline data (before treatment) for pain and functional mobility was recorded through Numeric Pain Rating Scale (NPRS)(24), and Sitting Rising Test SRT(25), respectively. Both measures will again be assessed very next day of treatment (follow-up) to evaluate the residual effects of treatment.

Pain intensity was the primary outcome and functional mobility serves as secondary outcome. Measured before treatment, after treatment and next day of treatment.

The data was analyzed, using SPSS. The difference within group pre and post readings paired T-test was applied whereas independent T-test inspect the difference between groups post treatment. Whereas, 95% of CI was recognized, alongside with a 5% significance level ($P < 0.05$).

3 RESULTS

Determination of this study was to explore the potential efficacy of visceral mobilization in comparison with traditional therapeutic exercises in management of low back pain. There were thirty female participants with complain of low back pain were allocated into two groups (experimental and control) randomly.

Visceral Mobilization: Comprising of 15 participants with mean age 34.07(±5.62) years, mean height 63.60(±3.52) inches, mean weight 154.80(±21.32) pounds and mean BMI 26.82(±1.98).

The minimum and maximum values for age, height, weight and BMI were (27, 45), (59, 68), (128,192), and (24.30, 31.00) respectively. Illustrated in table 1, fig. 1(b)

Traditional Therapeutic Exercises: Comprising of 15 participants with mean age 36.20(±4.75) years, mean height 65.00(±1.85) inches, mean weight 157.53(±15.22) pounds and mean BMI 26.2(±2.54).The minimum and maximum values for age, height, weight and BMI were (28, 45), (59, 67), (131,192), and

Table 1: Physical characteristics (Descriptive analysis)

	Experimental Group				Control Group			
	Mean	±SD	Max.	Min.	Mean	±SD	Max.	Min.
Age (years)	34.07	±5.62	27	45	36.20	±4.75	28	45
Height (Inches)	63.60	±3.52	59	68	65.00	±1.85	59	67
Weight (pounds)	154.80	±21.32	128	192	157.53	±15.22	131	192
BMI	26.82	±1.98	24.30	31.00	26.23	±2.54	22.50	31.00

SD: Standard Deviation, BMI: Body Mass Index, Max: Maximum, Min: Minimum

(22.50, 31.00) respectively. Illustrated in table 1, fig. 1(b)

Figure1 (a) Physical Characteristics (Experimental Group)

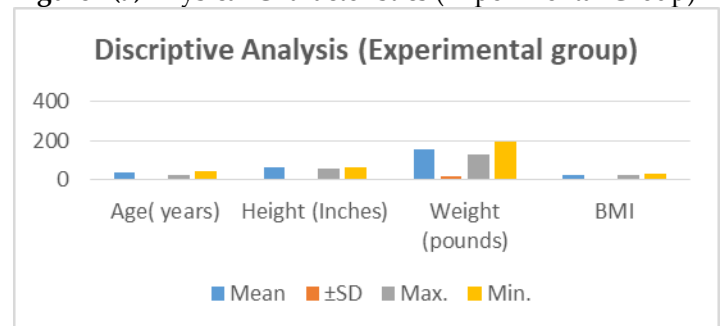


Figure1 (b): Physical Characteristics (Control group)

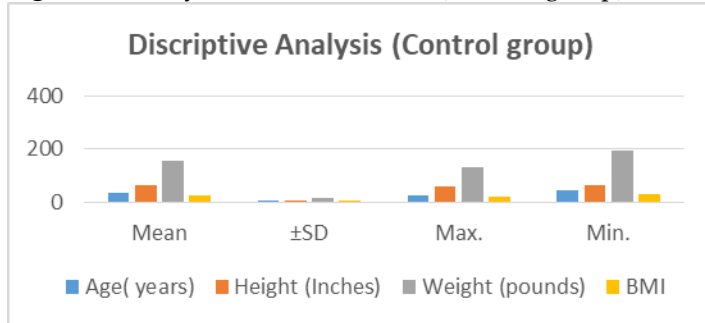


Table 2 illustrates the comparison between pre and post statistics of SRT and NPRS, the paired t test shows significant difference in both groups. Whereas Table 3 illustrates the comparison between pre and follow-up statics of SRT and NPRS. The T test shown significant residual effect on pain and functional mobility, in experimental group however there was non-significant result for functional mobility in control group, but results show significant residual improvement in pain intensity.

Table 2: Difference within groups (Pre and Post treatment)

	Experimental Group			Control Group		
	Mean Difference	±SD	P value	Mean Difference	±SD	P value
SRT(Sitting) Pre-Post	0.427	±.154	.000	0.010	±.002	.000
SRT(Rising) Pre-Post	0.399	±.209	.000	0.016	±.012	.000
NPRS Pre -Post	4.067	±1.033	.000	1.533	±.516	.000

SD: Standard Deviation, SRT: Sitting Rising Test, NPRS: Numeric Pain Rating Scale

Table 3: Difference within groups (Pre-treatment and follow up)

	Experimental Group			Control Group		
	Mean Difference	±SD	P value	Mean Difference	±SD	P value
SRT(Sitting) Pre- Post	0.068	.037	.000	0.003	.00958	.183
SRT(Rising) Pre- Post	0.047	.048	.002	0.001	.00834	.546
NPRS Pre -Post	1.867	.640	.000	0.667	.617	.001

SD: Standard Deviation, SRT: Sitting Rising Test, NPRS: Numeric Pain Rating Scale.

Figure 2: Mean Difference within groups (Pre and Post treatment)

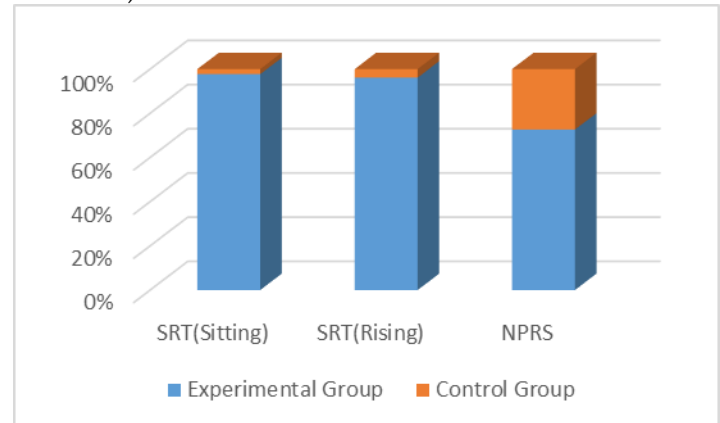
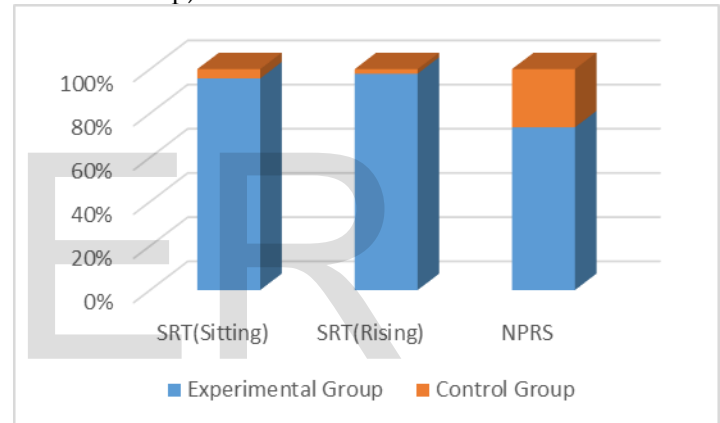


Figure 3: Mean Difference within groups (Pre-treatment and Follow-up)



Statistical analysis reveals VM to be affective for improving primary outcome (pain) immediately after treatment. Though the immediate effect of VM on functional mobility was difficult to assess immediately but slight improvement was seen. Successfully, participants were continued blinded to group status. There were no significant side effects reported in both groups

4 DISCUSSION

Current single blinded, randomized control trial explores immediate effects of visceral manipulation on back pain. The study outcomes prevail, VM significantly improves primary outcome i-e pain intensity and secondary outcome functional mobility in comparison with traditional therapeutic exercises. Experimental group which receives VM shows more significant improvement in post treatment measurements in comparison with control group receiving traditional therapeutic exercises.

The active strengthening exercises are recognized to improve the strength of back musculature. Hence result in increasing

the stability of low back musculature and reducing the strain in ligaments and joints(23).

However Visceral manipulation is based on the accurate placement of mild manual force to encourage regular visceral mobility in correspondence to their respective neighboring connective tissues (26).

Researches have also investigated the visceral relate disorders such as chronic constipation in women and irritable bowel syndrome, formerly found more recovering results with visceral treatment (27). Though few scholars apply visceral techniques on patients with LBP. However, the physiological and biomechanical mechanisms remain unverified(8,28). Thus study will contribute in this regard effectively.

According to Licciardone, the osteopathic manipulation technique (OMT) regimen that was related to the substantial and clinically significant procedures for low back pain. Hence, clinical OMT trial might be beneficial while continuing to further costly or more invasive medical interventions (29).

The application of visceral manipulation along with OMT and exercise regimen gave positive results together in patients with LBP. As we be certain of that, visceral fascial restrictions, were limiting the motion and were causing the pain in lumber section, therefore I should be taken in account that fascial restriction can cause these changes (28).

The investigators propose that the interventions which repressed the pain by decreasing muscle spasms and reducing the activation of sympathetic system. They summarize that the visceral measures enhanced blood flow all over the body and eliminated congesting bodily fluids. Therefore, serves as the additional benefits of OMT that the patients could experience get. Researchers also advocate that viscerosomatic segmental effects also may have reduced the pain. These findings validate the need for further investigation of viscerosomatic interactions in musculoskeletal complaints (30).

The weakness of this study was; it was impossible to blind the assessing therapist whereas successful blinding of participants serves as the strength of study. Use of VM is growing day by day.

4 CONCLUSION

This randomized control trial is one of the very few trials inspecting the efficacy of visceral manipulation as a treatment option for low back pain. Outcomes of this study reveal that using VM as a treatment protocol shows significant improvement in pain whereas effects on fictional mobility were uncertain. Therefore, further researches are obligatory to refine this treatment approach and more evidently assess the potential benefits.

REFERENCES

1. Meucci RD, Fassa AG, Faria NM. Prevalence of chronic low back pain: systematic review. *Rev Saúde Pública*. 2015 Oct 5;49:1.
2. Furlan AD, Giraldo M, Baskwill A, Irvin E, Imamura M. Massage for low-back pain. *Cochrane Database Syst Rev* [Internet]. 2015 [cited 2019 Nov 27];(9). Available from: <https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD001929.pub3/abstract>
3. Hoy D, March L, Brooks P, Blyth F, Woolf A, Bain C, et al. The global burden of low back pain: estimates from the Global Burden of Disease 2010 study. *Ann Rheum Dis*. 2014 Jun 1;73(6):968-74.
4. Calvo-Muñoz I, Gómez-Conesa A, Sánchez-Meca J. Prevalence of low back pain in children and adolescents: a meta-analysis. *BMC Pediatr*. 2013 Jan 26;13:14.
5. Boulanger KT, Campo S, Glanville JL, Lowe JB, Yang J. The Development and Validation of the Client Expectations of Massage Scale. *Int J Ther Massage Bodyw*. 2012 Sep 26;5(3):3-15.
6. Fernandes WVB, Blanco CR, Politti F, de Cordoba Lanza F, Lucareli PRG, Corrêa JCF. The effect of a six-week osteopathic visceral manipulation in patients with non-specific chronic low back pain and functional constipation: study protocol for a randomized controlled trial. *Trials*. 2018 Mar 2;19(1):151.
7. Licciardone JC, Aryal S. Clinical response and relapse in patients with chronic low back pain following osteopathic manual treatment: Results from the OSTEO-PATHIC Trial. *Man Ther*. 2014 Dec 1;19(6):541-8.
8. Panagopoulos J, Hancock MJ, Ferreira P, Hush J, Petocz P. Does the addition of visceral manipulation alter outcomes for patients with low back pain? A randomized placebo controlled trial. *Eur J Pain Lond Engl*. 2015 Aug;19(7):899-907.
9. Low Back Pain Fact Sheet | National Institute of Neurological Disorders and Stroke [Internet]. [cited 2019 Nov 27]. Available from: <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Low-Back-Pain-Fact-Sheet>
10. Wáng YXJ, Wáng J-Q, Káplár Z. Increased low back pain prevalence in females than in males after menopause age: evidences based on synthetic literature review.

- Quant Imaging Med Surg. 2016 Apr;6(2):199-206.
11. Fascia: Its Role in Causing Lower Back Pain [Internet]. Lower Back Pain Answers. [cited 2019 Nov 28]. Available from: <https://www.lower-back-pain-answers.com/fascia.html>
 12. Visceral Manipulation (Organ Mobility) [Internet]. [cited 2019 Nov 27]. Available from: <http://www.hearthealing.com.au/a/Services/Visceral-Manipulation-Organ-Mobility>
 13. Kamper SJ, Apeldoorn AT, Chiarotto A, Smeets RJE, Ostelo RWJG, Guzman J, et al. Multidisciplinary biopsychosocial rehabilitation for chronic low back pain: Cochrane systematic review and meta-analysis. *BMJ* [Internet]. 2015 Feb 18 [cited 2019 Nov 27];350. Available from: <https://www.bmj.com/content/350/bmj.h444>
 14. The-Female-Reproductive-System-Indications-for-Visceral-Manipulation.pdf.
 15. Tozzi P, Bongiorno D, Vitturini C. Low back pain and kidney mobility: local osteopathic fascial manipulation decreases pain perception and improves renal mobility. *J Bodyw Mov Ther.* 2012 Jul 1;16(3):381-91.
 16. Treatment of refractory irritable bowel syndrome with visceral osteopathy: Short-term and long-term results of a randomized trial - Attali - 2013 - Journal of Digestive Diseases - Wiley Online Library [Internet]. [cited 2019 Nov 27]. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1111/1751-2980.12098>
 17. What is Visceral Manipulation? An Integrated Part of Physiotherapy - Why Things Hurt [Internet]. [cited 2019 Nov 27]. Available from: <http://www.whyythingshurt.com/what-is-visceral-manipulation-an-integrated-part-of-physiotherapy/>
 18. Ajimsha MS, Al-Mudahka NR, Al-Madzhar JA. Effectiveness of myofascial release: Systematic review of randomized controlled trials. *J Bodyw Mov Ther.* 2015 Jan 1;19(1):102-12.
 19. Woolf CJ. Central sensitization: implications for the diagnosis and treatment of pain. *Pain.* 2011 Mar;152(3 Suppl):S2-15.
 20. Meltzer KR, Cao TV, Schad JF, King H, Stoll ST, Standley PR. In Vitro Modeling of Repetitive Motion Injury and Myofascial Release. *J Bodyw Mov Ther.* 2010 Apr;14(2):162-71.
 21. Tozzi P. Selected fascial aspects of osteopathic practice. *J Bodyw Mov Ther.* 2012 Oct 1;16(4):503-19.
 22. Snapshot [Internet]. [cited 2019 Nov 28]. Available from: <https://www.barral.co.nz/visceral-manipulation>
 23. Ali MF, Selim MN, Elwardany SH, Elbehary NA, Helmy AM. Osteopathic Manual Therapy Versus Traditional Exercises in the Treatment of Mechanical Low Back Pain. *Am J Med Med Sci.* 2015;5(2):63-72.
 24. Abbott JH, Schmitt J. Minimum Important Differences for the Patient-Specific Functional Scale, 4 Region-Specific Outcome Measures, and the Numeric Pain Rating Scale. *J Orthop Sports Phys Ther.* 2014 May 14;44(8):560-4.
 25. Rodrigues CP, Silva RA da, Nasralla Neto E, Andraus RAC, Fernandes MTP, Fernandes KBP, et al. ANALYSIS OF FUNCTIONAL CAPACITY IN INDIVIDUALS WITH AND WITHOUT CHRONIC LOWER BACK PAIN. *Acta Ortopédica Bras.* 2017 Aug;25(4):143-6.
 26. Visceral manipulation...you couldn't make it up [Internet]. [cited 2019 Nov 27]. Available from: <https://edzardernst.com/2014/01/visceral-manipulation-you-couldnt-make-it-up/>
 27. Belvaux A, Bouchoucha M, Benamouzig R. Osteopathic management of chronic constipation in women patients. Results of a pilot study. *Clin Res Hepatol Gastroenterol.* 2017 Oct 1;41(5):602-11.
 28. Tamer S, Öz M, Ülger Ö. The effect of visceral osteopathic manual therapy applications on pain, quality of life and function in patients with chronic nonspecific low back pain. *J Back Musculoskelet Rehabil.* 2017 Jan 1;30(3):419-25.
 29. Licciardone JC, Gatchel RJ, Aryal S. Recovery From Chronic Low Back Pain After Osteopathic Manipulative Treatment: A Randomized Controlled Trial. *J Am Osteopath Assoc.* 2016 Mar 1;116(3):144-55.
 30. King HH. Addition of Osteopathic Visceral Manipulation to OMT for Low Back Pain Decreases Pain and Increases Quality of Life. *J Am Osteopath Assoc.* 2017 May 1;117(5):333-4.