

EFFICACY OF MOTORIZED INTERMITTENT LUMBAR TRACTION AND WILLIAM FLEXION EXERCISE FOR DECREASING PAIN AND DISABILITY LEVEL IN PATIENTS OF NON-SPECIFIC LOW BACK PAIN

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ABSTRACT:

OBJECTIVES:

Examine effect of Motorized intermittent lumbar traction and find effective treatment for pain and disability in patients of NSLBP.

METHODS:

120 patients (mean age 26.51 ± 2.95) with Non-Specific LBP were randomized into two groups. In first group (1) motorized intermittent traction for long period of time with William flexion exercises and in second group (2) only William flexion exercises were given. Hot pack and postural education were given to both groups. Each group included 30 male patients and 30 female patients. Treatment among both groups was conducted for variations in disability level and pain score.

RESULTS:

Out of 120 subjects, 20 were dropout, 18 from group 1 and 6 from group 2 due to various reasons like financial issue, schedule problems and increase in pain level. Traction group showed greater improvement in pain level (VAS $p < 0.05$). About 73% subjects reported minimal disability in group 1 ($p < 0.05$) and 37% in group 2, which shows that lumbar traction treatment was more effective in reduction of pain and disability score.

Conclusion:

Owing to the statistical significance difference in current study, and view of sample power due to large number of patients in each group, the results lead to positive conclusion. Therefore, it can be concluded that lumbar traction seems to be more effective than William flexion exercises. In addition, it can be concluded that traction with William flexion exercise is more effective than solo William flexion exercises.

INTRODUCTION:

Low back pain (LBP) is a core issue of health (Wand and O'Connell, 2008). Majority of the people experience it in their life. The term LBP is described as pain which is felt between twelfth rib and gluteal area with and without lower limb pain varies by different causes (Norasteh, 2012). These symptoms can develop in all age groups, social groups and occupations of the world. These symptoms can persist from 2 to 3 months and reoccurrences in 80% to 90% of the patients (Yang et al., 2015). Back pain and its associated disability improve within weeks.

Prognosis of acute LBP is favorable (Pengel, 2003). About 90% people suffer from LBP in their adulthood (Amano et al., 2016). Risk factors associated with back pain are of physical nature like, unusual weight lifting, obesity, twisting, bending, and vibration. Personal and work related factors are also including in it (Randolph, 2016).

Two types of LBP are specific and non-specific LBP. Back pain without underlying serious

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pathology is non-specific and pain that is associated with known pathophysiology is specific LBP (Schnurrer, 2011). Nonspecific LBP can also be defined as; it is a soreness, stiffness or tension present in lower back without any specific reason of pain. Diagnosis of this type of pain depends on doctor being satisfied that there is no serious pathology or any specific cause of patient's pain (Vogel, 2009)

Evidence on review of management for subjects needs care for LBP and patients diagnosed with Non-Specific LBP. In acute Non-Specific LBP i-e 0-4 weeks, there is strong evidence that self-care, manipulative therapy and remain active is effective treatment for back pain. In sub-acute Non-Specific LBP i-e 4-12 weeks, there is adequate evidence that exercises therapy with cognitive behavioral is more useful than usual treatment. These types of treatment sessions reduce absenteeism from work. In chronic Non-Specific LBP i-e more than 12 week, various managements are present with partial efficacy on pain and disability level. There is very little suggestion about surgical procedure in chronic Non-Specific LBP (Nordin et al., 2006).

Spinal traction is usually used to treat the different spinal problems like degenerative disc diseases, spinal stenosis, herniated disc, muscle spasm or muscle guarding, joint pain or hypo-mobility and any other soft tissue associated problem. It is not practiced in osteoporosis, cancer and other life threatening conditions (Healthline, 2016).

Lumbar traction is generally used for the therapeutic effects of different pathologies.

In the Netherlands, lumbar traction applied for almost 7% Of physiotherapy sessions for the treatment of lumbar conditions. Application of this modality is based on clinical practice as well as experience. This physical agent is commonly indicated for the normalization of neurological signs and symptoms, improving joint mobility, pain and disability management (Krause et al., 2000). In this study intermittent mechanical traction was used to treatment of NSLBP.

Exercise therapy is advantageous in drooping the pain and correcting the activity of daily life in subjects with NSLBP (Hayden et al., 2005).

Different exercises are used to treat LBP i-e flexion exercises and extension exercises. In this study William flexion exercises were used to treat Non-Specific LBP.

According to (Gupta, 2016) William flexion exercises are

1. Single knee to chest
2. Double knee to chest
3. Pelvic tilt
4. Hamstring stretching
5. Hip flexor stretching
6. Partial curl up

The objective of this study was to examine the effects of motorized intermittent lumbar traction in Non-Specific back pain and to find out the effective treatment of NSLBP.

SUBJECTS AND METHODS:

This randomized control trial has been conducted in the department of physiotherapy at Iqbal Memorial hospital Jhang over a period of six months. Before collecting the data, all information about the study to the patient was provided. Each patient signed the informed consent forms and the privacy of patients taken into consideration. Patients of 20 to 35 ages were enrolled in the study if they were diagnosed as Non-Specific LBP. Study included 120 patients were met the inclusion criteria with equal gender distribution.

Demographic data such as name, age, gender, address, contact no. and date were documented. Two groups were made, in first group (1) motorized intermittent lumbar traction for long period of time with William flexion exercises were incorporated and in second group (2) William flexion exercises were given. Each group included 30 male patients and 30 female patients. Before starting the session of both groups hot pack was given for 10 minutes at the low back for superficial heat. Alternative sessions of treatment were given for 2 weeks.

All exercises were performed for 10 repetitions and same exercise performed by patient at home. Patients were not allowed to take any pain killer, muscle relaxant medicines, any injection or massage therapy. Postural and ergonomics education and precautions were given to both groups. All patients were treated with same traction apparatus

(ORTHOTRAC OL-2000), the apparatus was calibrated before starting the study.

In group (1) patient lay down on traction table in comfortable position then traction braces or belt was fastened around iliac crest and lumbar region. Patients in group 1 were told that they had to feel bearable pulling force in lumbar area. Treatment was discontinued if the pain increased or patient was free of symptoms before the last session.

Traction parameters included in this study are:

Table 1 Parameters of Traction

Traction bed	Motorized split table
Treatment mode	Intermittent
Traction force	Half of the body weight
Hold Period	10 seconds
Relax Period	10 seconds
Treatment duration	20 minutes
Treatment frequency	Alternative days for two weeks
Position of patient	Semi fowler position

Table 2 Paired sample "t" on VAS

VAS (before and after)	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval (CI) of the Difference		T	Df	Sig. (2-tailed)
				Lower	Upper			
				Pair 1	3.44			
Pair 2	5.27	1.61	.21	1.84	2.70	10.52	55	0.60

Pair sample t test is applied on VAS scale. There was significant difference before and after treatment in pain intensity between lumbar traction group (Mean±SD 3.44±2.16 and p=0.000) and William flexion exercise group (Mean±SD 5.27±1.61 and p=0.60) which shows that pain decreases in group 1 was significantly lower than group 2.

While disability level was measured by ODI which shows improvement in disability level after the treatment in both groups but greater improvement was achieved in the group 1 as compared to group 2. The table 3 shows

The pain score was measured by pain measurement tool such as visual analogue scale (VAS) and disability level was measured by another tool such as modified Oswestry Disability Index (ODI). Pain intensity was measured before the treatment, after every third session and before the discharge. Disability level was measured before the treatment, after one week then at the termination of treatment.

RESULTS:

The total number of patients was 120 of Non-Specific LBP. They were divided into 2 groups of 60 patients in each group. Each group had 30 males and 30 females. One group was treated with lumbar traction group and the other by William flexion exercise group. 12 patients in the lumbar traction drop out due to various reasons and 6 patients in the William flexion group. Group 1 was lumbar traction group and group 2 was William flexion group. The mean age of the patients in lumbar traction group was 25.5± 4.8 years and 26.2 ± 5.0 years in William flexion group.

group 1 and table 3 shows group 2, ODI score interpretation.

Table 3 ODI score of interpretation in lumbar traction group

ODI score	Frequency before	Frequency mid	Frequency after
0-20%	2	25	35
20-40%	32	15	10
40-60%	20	4	3
60-80%	6	4	0
80-100%	0	0	0
Total	60	48	48

Table 4 ODI score of interpretation in William flexion group

ODI score	Frequency before	Frequency mid	Frequency after
0-20%	2	15	20
20-40%	28	25	29
40-60%	20	7	3
60-80%	10	7	2
80-100%	0	0	0
Total	60	54	54

Table 4 Pair sample "t" test on ODI

VAS	Mean dif	Std.dev	Std error	t	df	P
Pair 1	28.2	0.11	0.48	593.5	4	0.000
Pair 2	18.33	4.25	1.90	9.6	4	0.06

About 73% subjects reported minimal disability in group 1 and 37% in group, which shows that lumbar traction treatment was more effective in reducing disability level. $P < 0.05$ in group 1 and $p = 0.06$ in group 2 which shows that group 1 is more effective than 2 but there was no more difference between the groups at the end of treatment.

DISCUSSION:

The design and conduct of this trial, tried to avoid various flaws about the use of lumbar traction in published studies.

In the present study patients of Non-Specific LBP was included because only 5% to 10% of patients present with any specific cause of back pain. Balagué et al., (2012) reported that Non-Specific LBP is the major issue of health. Near about 90% of patients diagnosed as Non-Specific LBP (Krismer and van Tulder, 2007).

In the current experimental study protocol such as split table and semi-fowler position of patients were used for the effective results of traction. Traction not only distracts the spine but also generate flexion moment which is produced by traction force. The study shows that significant flexion on the lumbar spine is due to semi-fowler position of subjects.

During traction therapy, increases the posterior disc height as well as straightening the lumbar lordosis are due to flexion moment. Split table of lumbar traction eliminate the frictional force. Traction force becomes more effective because of split table and semi-fowler position (Lee and Evans, 2001).

The VAS before treatment was 4 to 8 in both groups with a mean of 6.2 ± 5.44 in lumbar traction and 6.1 ± 8.92 in William flexion group.

VAS noted at 6 session of treatment was 3 to 7 in both groups, Mean score of group 1 is 4.63 and group 2 is 5.11.

At the end of treatment sessions, Pain was constant from 3-7 as was observed previous session treatment of William flexion, whereas pain decrease in lumbar traction was from 2-7.

Pair sample t test is applied on VAS scale. There was significant difference before and after treatment in pain intensity between lumbar traction group (Mean \pm SD 3.44 ± 2.16 and $p = 0.000$) and William flexion exercise group (Mean \pm SD 5.27 ± 1.61 and $p = 0.60$) which shows that pain decreases in group 1 was significantly lower than group 2. Similarly, both groups showed improvement in pain level according to VAS but their difference was zero (Beurskens et al, 1991). One of the previous study shows Significance reduction in VAS score in sub-acute ($P < 0.05$) as compared to chronic NSLBP (Krause et al,). Fritz et al., (2010) study on efficacy of lumbar traction. This study was concluded that group of traction show greater improvement in pain i-e significant fall in VAS score ($P < 0.05$).

According to ODI scale about 73% subjects reported minimal disability in group 1 and 37% in group 2, which shows that lumbar traction treatment was more effective in reducing disability level. Group 1 shows greater improvement in ADLs such as in walking, standing, sitting, lifting weights, personal care of life, and sleeping, travelling and social life as compared to group 2. Similarly, Van der Heijden et al., (1995) concluded his results, after carrying out a research on efficacy of traction in Non-Specific LBP. This study was approved by Maastricht

hospital of university and ethics Committee of University of Limburg. It was conducted at physical therapy department of hospital. At 5th week 34% patients from control group and 64% patients from treatment group were completely recovered. At 9 weeks 25% patients from control group and 45% from treatment group were reported completely recovered. Primary effects showed traction is more efficient than sham traction. Krause et al., (2000) concluded that traction was more beneficial in sub-acute and chronic than acute Non-Specific LBP.

In the current study, pain & disability was measured by VAS and ODI scale. Similarly, Borman, et al. (2003) reported effectiveness and usefulness of mechanical lumbar traction in non-specific LBP. Both groups completed the two forms i-e ODI for evaluation of disability level and VAS for evaluation of pain intensity. There were 14 male and 28 female subjects with mean of 43.1 ± 9.53 years. Both group showed significant fall in pain score ($p < 0.01$) & functional level ($p < 0.01$) at the end of treatment. 47.6% subjects of group 1 and 40% subjects of group 2 were completely or mild improved.

In the current study motorized intermittent lumbar traction was combined with William flexion exercises. So it becomes more effective. Similarly, Clarke et al., (2006) also has done work on traction. Consequences of trial exposed solid evidence that there was no substantial alteration in outcomes between traction group and no treatment, modest evidence that motorized lumbar traction as a single intervention in treatment was not more effective than other interventions and inadequate evidence that lumbar traction was effective if combine with other interventions.

CONCLUSION:

Owing to the statistical significance difference in present study, and view of sample power due to large number of patients in each group, the results lead to positive conclusion. Therefore, it can be concluded that lumbar traction seems to be more effective than William flexion exercises. In addition, it can also be determined that traction with William flexion exercise is more effective than solo William flexion exercises.

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BE AFRAID OF A GENTLEMAN WHEN HE IS HUNGRY, AND OF A MEAN PERSON WHEN HIS STOMACH IS FULL.

HEARTS OF PEOPLE ARE LIKE WILD BEASTS. THEY ATTACH THEMSELVES TO THOSE WHO LOVE AND TRAIN THEM.

Hazrat Ali (Karmulha Wajhay)