Original Article

Comparison of Mulligan sustained natural apophyseal glides verses Mckenzie extension exercises on disability and functional outcomes in patients with acute nonspecific low back pain

Dileep Kumar Lohana, Umair Ahmad, Faiza Sharif, Ashfaq Ahmad, Amir Ali Gilani, Salwa Atta

Department of Physical Therapy, Lahore College of Physical Therapy, University of Lahore, Pakistan

Objective: To compare effectiveness of Mulligan sustained natural apophyseal glides (SNAGs) and McKenzie extension exercises to reduce disability in patients with acute non-specific low back pain.

Methodology: This was double blinded randomized controlled trial was conducted at Gosha E Shifa Hospital, Lahore. We randomized 84 patients through computer number generator and were allocated into group A and B by concealment through envelope. The questionnaire was based on two primary outcome measures i.e. Back performance Scale for ADL's and Owestry Disability Index for functional disability. Patients were assessed before-treatment i.e. t0, mid treatment i.e. t1 and after treatment i.e. t2.

Results: Mean age for patients in group A was 41.97±8.16 years and in group it was 45.02±7.29 years. Out of 84 patients, 45.24% were males and 54.76% females. Functional abilities measured by Back Performance Scale was found to be 5.02±2.05 and 6.78±3.3 at post treatment level (p=0.00). Back Performance Scale results at 8th week follow up for both groups were 2.15±1.64 and 3.16±2.43, respectively (p=0.03). Functional disability measured by Owestry disability Index was 35.0%±2.21% and 34.3±2.37% at post treatment level (p=0.16). Owestry Disability Index results at 8th week follow up for both groups were 23.62±2.8% and 22.64±2.4%, respectively (p=0.11).

Conclusion: McKenzie exercises and SNAGs both were equally effective in improving pain whereas McKenzie exercises improved functional abilities better than SNAGs. (Rawal Med J 202;46:469-472).

Keywords: McKenzie extension exercises, apophyseal glides, mulligan.

INTRODUCTION

Mobilizations with movement at lumbar spine involves application of an accessory glide along plane of facet joint in weight bearing position with active movements by patient.[1] These spinal techniques improve signs and symptoms directly by facilitating restricted facet joint mobility and influences mobility of intervertebral joints as proposed by Mulligan.[2] According to Mulligan, the effect of MWMs is based on the premise that pain is associated with 'positional fault(s)' in joints with resultant subtle "biomechanical" changes such as joint restriction and stiffness.[3] Over the years, McKenzie exercises have been used.[3] Each exercise has to be repeated for at least ten times per day.[4] According to McKenzie, if normal function does not restore within a given time fame, tissues do not heal thus the problem persists.[5]

Special care should be taken when diagnosing and assessing the direction of pain as adverse effects of exercises in the wrong direction result in poor outcomes.[6] Thus, inter-professional care is necessary to treat low back pain especially when discs are involved.[7] The study shall explore and determine the effects of Mulligan Sustained Apophyseal Glides on disability and functional outcomes in patients with acute non-specific back pain.

METHODOLOGY

This double blinded randomized controlled trial was conducted at Gosha E Shifa Hospital, Lahore and included 84 diagnosed cases of nonspecific low

back pain. Patients of both gender above 30 years were included in the study. Patients above 65 years and those with pain less than one year duration were excluded. Amongst 42 patients of group A, 14 were males and 28 were females whereas amongst Group B, 24 were males and 18 were females.

The patients signed informed consent. The trial was registered with Iranian Registry of Clinical Trials with a registration number IRCT20200608047700N1. The ethical review committee Board approved the study (Approval number IRB-UOL-FAHS/716- II/2020).

An assessor was responsible to assess and take measurements at various levels i.e. pre-treatment, post treatment and at 8th week post treatment. The questionnaires were based on two primary outcome measures i.e. Back Performance Scale for functional abilities and Owestry Disability Index for functional disability.

Patients of both groups were treated on intention to treat principle which meant that any patient regardless of the group in which he/she was allocated were provided with the necessary treatment when they needed it. From group A, 4 patients were given analgesics, 2 were asked to take rest in order to settle their pain. From group B only 3 patients required IV injections i.e. pain killers and 2 were provided muscle relaxants in order to release their stiffness. An adequate follow up of 85% was completed as 2 patients from group A and 1 patient from group B did not attend the sessions till end and therapist could not have their readings at Post treatment level. Three patients from group A and 4 patients from B did not come for follow up session thus completing the 25% drop out.

Statistical Analysis: All data analysis was performed using SPSS Statistics 25. Independent Sample T test was used for comparison groups. $p<0.05$ was considered significant.

RESULTS

Mean age for patients in group A was 41.97±8.16 and in group B it was 45.02±7.29 years. There was no noteworthy difference between the groups for Age (p=0.75), Pre-Treatment BPS (p=0.24) and Pre-Treatment ODI score (p=0.22) (Table 1).

Table 1. Characteristics of patients.

Variable	Group A Cyriax		Group B Mulligan	
Age	Mean	41.97± 8.16	Mean	45.02± 7.29
Gender	Males Females	14 28	Males Females	24 18
Occupation	Housewife Teacher Chef Mechanic Banker Driver	15 10 3 3 6 5	House wife Teacher Chef Mechanic Banker Driver	7 6 5 7 9 8
Patient Referral	Neuro physician General Physician Orthopedic Physician Others	9 12 10 11	Neuro physician General Physician Orthopedic Physician Others	13 9 14 6
Duration of Symptoms	5-10 days 11-15 days 16-20 days 21-25 days 26-30 days	4 11 6 13 8	5-10 days 11-15 days 16-20 days 21-25 days 26-30 days	3 10 6 22 1
Co Morbidities	Hypertension Diabetes Mellitus Cardiac Problems Others None	14 8 1 8 11	Hypertension Diabetes Mellitus Cardiac Problems Others None	6 5 7 9 15
Radiation of Symptoms	Pain radiates Pain does not radiates	20 22	Pain radiates Pain does not radiates	12 30
Type of Pain	Deep pain Superficial pain Shooting pain Burning pain	12 1 10 9	Deep pain Superficial pain Shooting pain Burning pain	8 8 10 11
Aggravating Factors	Coughing Sneezing Laughing Deep Breathing With Activity	15 11 10 6 0	Coughing Sneezing Laughing Deep Breathing With Activity	4 7 9 7 15

Table 2. Baseline characteristics of patients.

	Group	Mean	Std. Deviation	p
Age of the participant	Group A Group B	41.97 45.02	8.16 7.29	0.75
Back Performance Scale Pre-treatment	Group A Group B	14.95 14.97	0.21 0.15	0.24
Oswestry Disability Index Pre-Treatment	Group A Group B	46.09% 47.57%	5.03 5.86	0.22

Table 3. Between and within group analysis of primary outcome measures at post treatment and follow up.

Outcome measures and level of assessment	Group of patients	Number of patients	Mean standard deviation	p
BPS Post treatment	A B	40 39	5.02 ± 2.05 6.78 ± 3.3	0.00
BPS 8th Week follow up	A B	37 37	2.15 ± 1.64 3.16 ± 2.43	0.03
ODI Post Treatment	A B	40 39	35.0% ± 2.21% 34.3% ± 2.37%	0.16
ODI 8th week follow up	A B	37 37	23.62% 2.8% 22.64% 2.4%	0.11

Results of the independent t test between the group analysis showed that McKenzie Exercise group and SNAGs Group varied statistically significantly in expressions of Post-treatment functional ability 5.02±2.05 and 6.78±3.3, respectively (p=0.00). Back Performance Scale results at 8th week follow up for both groups were 2.15±1.64 and 3.16±2.43, respectively (p=0.03) i.e. significant (Table 2). Results of the independent t test between the group analysis showed that McKenzie Exercise group and SNAGs Group varied statistically non-significantly in expressions of Post-treatment disability 35.0±2.21% and 34.3±2.37%, respectively (p=0.16) (Table 3). Owestry Disability Index results at 8th week follow up for both groups were 23.62±2.8% and 22.64±2.4%, respectively (p=0.11) i.e. non-significant.

DISCUSSION

McKenzie exercises were found to play a major role in improving range of motion of spine and the results of our study are consistent with another research conducted to determine effects of McKenzie on functional status of patients. A study was also conducted to determine effects of spinal manipulation and Mulligan Mobilization. Lumbar flexion Range of motion, pain and functional status of patients were significantly improved in patients over time of both groups.

These results were found to be similar to those of ours as patient's outcomes in our study also improved over time of 8 weeks.[8] A study conducted earlier also concluded that Mulligan SNAGs and mobilizations are effective in reducing pain, increasing lumbar range of motion and functional performance over time. They had this comparison with Maitland mobilizations and reported to have a non-significant difference between the two groups over duration of 8 weeks.

These results differed from another study conducted to compare the effectiveness of Mulligan SNAGs and thoracic posture correction exercises. They concluded significant difference i.e. p=0.0001 which means that patients who received Sustained Natural Apophyseal glides on spine had more decreased pain and increased range of motion along with functional independence.[9]

The results of another study were found to be contrary to that of ours as they assessed the effectiveness of Mulligan and Maitland mobilization on Sacro-Iliac joint dysfunction. They concluded that patients who received Mulligan mobilizations had better outcomes as compared to those who received Maitland mobilization and their pain, range of motion and disability improved over the time significantly.

CONCLUSION

McKenzie exercises improved range of motion ability better than SNAGs whereas McKenzie exercises and SNAGs both were equally effective in improving functional disability of patients.

Author Contributions:
Conception & design: Dileep Kumar Lohana
Collection & assembly of data: Salwa Atta, Mir Shakeel Ahmad
Analysis & Interpretation of data: Salwa Atta, Mir Shakeel Ahmad
Drafting of the article: Salwa Atta
Critical revision: Salwa Atta, Mir Shakeel Ahmad
Statistical expertise: Salwa Atta
Final approval and guarantor: Umair Ahmad, Faiza Sharif , Ashfaq Ahmad
Corresponding author email: Salwa Atta: salwaatta4@gmail.com
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