



## COMPARATIVE CLINICAL STUDY

# Effect of Butler's neural tissue mobilization and Mulligan's bent leg raise on pain and straight leg raise in patients of low back ache



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### KEYWORDS

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Mulligan bent leg  
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SLR

**Summary** Low back ache (LBA) is a common musculoskeletal disorder sometimes associated with a positive limited Straight leg raise (SLR) test. Mulligan's bent leg raise (BLR) and Butler's neural tissue mobilization (NTM) are commonly used techniques for the treatment of low back ache where SLR is limited. The aim of this study was to evaluate the effect of both the techniques on pain and limited SLR in patients with LBA. Thirty one patients with LBA with radiculopathy were randomly allocated into 2 groups; BLR [n = 16] NTM [n = 15]. The outcome measures i.e. visual analogue scale (VAS) for pain and universal goniometer for measuring SLR range of motion (SROM) were assessed at the baseline, post intervention and after 24 h (follow up). Within group analysis using paired t-test revealed a significant difference between pre-treatment and post-treatment VAS and SROM score ( $p < 0.05$ ). However no difference was seen between pre-treatment and follow up ( $p > 0.05$ ). The study showed that both techniques produce immediate improvement in pain and SLR range but this effect was not maintained during the follow up period.

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## Introduction

Low back pain (LBP) is a complex condition, influenced by a number of factors and often challenging when trying to

identify any singular cause or even a single major factor (Deyo, 2002).

Low back pain is a common musculoskeletal disorder with a lifetime prevalence reported to be as high as 84% by World Health Organization (WHO) (Wilson et al., 2003).

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There are various causes of low back pain including: congenital, traumatic, inflammatory, degenerative, neoplastic, metabolic, pain referred from viscera, miscellaneous (Maheshwari, 2005). The diagnosis can be confirmed following clinical examination and assessment. In the clinical examination, the Straight Leg Raise (SLR) test is of great value in assessing normality of roots of sciatic nerve (Breig and Troup, 1979; Urban, 1981) and tightness of hamstring muscles (Tanigawa, 1972; Medeiros et al., 1977; Erickson and Coney, 1979; Halkovich et al., 1981). It is used to test the movement and mechanical sensitivity of lumbo-sacral neural structures and their distal extensions which consist of the lumbo-sacral trunk and plexus in the pelvis, sciatic and tibial nerves and their distal extensions in the leg and foot (Shacklock, 2005a, b).

Various therapeutic techniques are used to treat LBA amongst which Butler's neural mobilization and Mulligan's Bent Leg Raise (BLR) are preferred by many. Butler's neural mobilization is an a neural mobilization technique which is used in relation with pathologies of the nervous system. It has been reported to be an effective intervention for certain conditions including neck pain, carpal tunnel syndrome and low back pain (Nar, 2014; Basson et al., 2014; Adel, 2011; Vijay et al., 2007; Manchanda, 2013).

Mulligan's Mobilization With Movement (MWM) BLR can be used in treatment of low back pain and/or painful straight leg raise. It can be given with leg pain above the knee.

Many studies have evaluated the effects of Mulligan's BLR technique in patients with low back pain (Hall, 2006; Pawar and Metgud, 2010; Phansopkar and Kage, 2014; Kage and Ratnam, 2014). However, only few Randomized Controlled trials (RCTs) have specifically compared Mulligan's mobilization and Butler's neural mobilization approaches individually for low back pain (Patel, 2014; Gupta and Shenoy, 2013). Thus more research is required in comparing the effectiveness of both these techniques in patients with LBP.

## Methods

### Study design

Randomized controlled trial.

### Participants

Patients with complaints of low back pain who were referred to the physiotherapy OPDs were screened and recruited in the study depending upon the inclusion exclusion criteria.

Inclusion Criteria was: Patients with low back pain radiating to lower limb (above knee), Unilateral SLR positive between 35 and 70°, onset of pain within 1 month.

Exclusion Criteria: Bilateral SLR positive, any malignant condition, sensory motor deficits, articular pathology or fractures of lower extremities, patient not under the influence of any analgesics such as NSAIDs/Opiates (with permission from physicians).

After approval from the institutional ethics committee, written consent was taken from each subject. 31 subjects

were selected and randomly allocated to one of the two groups, where group A was given Mulligan bent leg raise technique (n = 16) and group B was given Butler's neural tissue mobilization technique (n = 15).

All the subjects were assessed for intensity of pain on VAS and SLR ranges by using universal goniometer at the base line. Inter tester and intra tester reliability of goniometric measurement for SLR was found to be 0.88 (Hsieh, 1983).

As the study was single blinded, the primary therapist included the patient and delivered therapy while a secondary therapist assessed the outcome measures (pain and ROM). Measurements for SLR range of motion and pain were repeated immediately post treatment and after 24 h (follow up).

SLR was considered positive where patients complained of reproduction of the symptoms in the back.

Mulligan's BLR (Mulligan, 2004) (See Fig. 1).

The therapist stood at limited SLR side of the patient. Patient's flexed knee was kept over therapist's shoulder. Therapist instructed patient to push her away with patient's leg and then relax. At this point therapist extended the patient's bent knee up as far as possible in the direction of patient's ipsilateral shoulder provided there was no pain. If it was painful the direction was altered by taking the leg more medially or laterally. Sustained stretch for several seconds was given and leg lowered down to the bed. This technique was repeated 3 times.

Butler's Neural Mobilization (Butler, 1991) (See Fig. 2).

Patient was in supine position. Therapist stood facing the patient and placed one hand under the ankle to avoid pressure on peripheral nerves and the other above the patella. The knee was extended and hip was flexed in one plane and the leg was taken to the point where symptoms were reproduced.

Slow oscillations or sustained stretch was given by the therapist for 10 s depending on the grade of mobilization after which the leg was returned to a non-painful position. This procedure was repeated three times.

### Data analysis

Data was analysed using the Statistical Package for the Social Sciences (SPSS) version 10. In within group analysis



Figure 1 Mulligan bent leg raise technique.

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