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Competence of Mulligan's Mobilization Combined with and without Muscle Energy Technique in Patients with Frozen Shoulder

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ABSTRACT

A frequent ailment that causes severe shoulder stiffness and limited range of motion, periarthritis of the shoulder, often known as frozen shoulder, significantly impairs daily functioning. The purpose of this study was to assess how well Mulligan's Mobilization, both with and without the Muscle Energy Technique (MET), reduced pain and increased functional mobility in patients with shoulder periarthritis. Forty volunteers with a diagnosis of frozen shoulder participated in a randomized experimental trial. Group A received Mulligan's Mobilization with MET, while Group B received Mulligan's Mobilization without MET in addition to both conventional therapy and ultrasonography. Participants were divided into these two groups at random. Before and after therapy, the Visual Analogue Scale (VAS) and Shoulder Pain and dysfunction Index (SPADI) were used to measure the degree of pain and functional dysfunction. Paired and independent t-tests were used in the statistical analyses to examine differences within and between groups, respectively. Both groups' functional mobility and pain levels significantly improved. With larger drops in VAS and SPADI ratings than Group B (without MET), Group A (with MET) showed better results. Group A's SPADI score considerably improved, however its VAS score dropped 1.95 points more than Group B's. This study demonstrates that Mulligan's Mobilization and MET work better together than mobilization alone to improve shoulder function and discomfort.

Keywords: Frozen shoulder; Mulligan's Mobilization; Muscle Energy Technique; Shoulder pain; Functional mobility

1 INTRODUCTION

The painful ailment known as periarthritis of the shoulder, sometimes referred to as frozen shoulder or adhesive capsulitis, is typified by a gradual onset of shoulder stiffness and limited range of motion (ROM), which frequently results in a severe handicap in day-to-day activities. With a cumulative risk of about 2%, periarthritis of the shoulder, sometimes referred to as frozen shoulder or adhesive capsulitis, is a frequent illness in India that primarily affects people between the ages of 40 and 60.[1] The illness affects women more often than men, with a 1.5:1 female to male ratio[2] and has a significant association with diabetes, with a higher incidence observed in diabetic patients.[3,4] Treatment typically involves physiotherapy, analgesics, and steroid injections, but alternative therapies like Varmam therapy from the Siddha system have also shown efficacy.[3] Evaluating the effectiveness of these therapy techniques in reducing pain and enhancing functional mobility is the goal of the study on Mulligan's Mobilization with and without Muscle Energy Technique (MET) in patients with shoulder periarthritis. Painful shoulder mobility restriction is a hallmark of periarthritis, which has a major impact on everyday activities and quality of life. In order to provide insight into prospective therapeutic approaches for managing this illness, this study examined the ways in which Mulligan's Mobilization, both with and without MET, can improve patient outcomes, specifically in terms of pain reduction and functional improvement.

Patients with shoulder disorders have shown notable improvement in range of motion (ROM) and pain reduction with Mulligan's Mobilization with Movement (MWM). Research has demonstrated that MWM is effective in treating shoulder dysfunction, especially adhesive capsulitis and periarthritis[5,6] Research also indicates that MWM leads to greater improvements in functional activity when

compared to traditional muscle strengthening exercises, further supporting its role as an effective intervention for shoulder pain and disability.[5] Another method for mobilizing restricted joints is the Muscle Energy Technique (MET), which involves extending hypertonic muscles and fascia. By using voluntary muscular contractions, it seeks to lessen discomfort and restore normal movement patterns. Even while MET has been shown to be useful in increasing joint mobility and reducing pain, research indicates that when performed alone, it might not have as much of an impact on pain management and functional improvement as MWM.[6,7]

Studies examining the efficacy of combining MWM and MET have revealed that doing so may yield better results than utilizing either method alone. Research has shown that when MWM and MET are combined, functional status and pain alleviation increase more significantly.[7,8] The purpose of this study was to assess how well Mulligan's Mobilization, both with and without the Muscle Energy Technique (MET), improved pain and functional mobility in patients with shoulder periarthritis.

2 METHODS

The effectiveness of Mulligan's Mobilization with and without the Muscle Energy Technique in treating patients with shoulder periarthritis was assessed in this randomized experimental trial. Forty individuals with frozen shoulder diagnoses, ranging in age from 35 to 70, were selected from the outpatient physiotherapy department of Krupanidhi College. The materials required for the study included the VAS scale, SPADI index, ultrasound, gel, and pen. The study duration was 3 weeks, and the participants were randomly assigned to different treatment groups using a random sampling technique into Group A (n=20), who received Mulligan's Mobilization with muscle energy with conventional therapy and ultrasound therapy, and Group B (n=20), who received Mulligan's Mobilization without Muscle Energy with conventional therapy and ultrasound therapy.The Shoulder Pain and Disability Index (SPADI) was used to measure shoulder pain and functional disability both before and after therapy, and the Visual Analogue Scale (VAS) was used to gauge the severity of the pain. Pre-test and post-test scores were compared using a paired t-test to assess within-group changes. To ascertain if there were statistically significant variations in pain severity and functional impairment among the groups, the paired t-test was employed.

An independent t-test was used to evaluate the differences in post-test VAS and SPADI scores between Group A (Kaltenborn's posterior mobilization) and Group B (movement with mobilization) in order to compare the efficacy of the treatments between the two groups. For both tests, a p-value of less than 0.05 was deemed statistically significant.

3 RESULTS

The paired t-test, which compares pre- and post-test VAS and SPADI scores within groups, revealed substantial improvements for both groups. With a p-value of less than 0.001, the mean VAS score in Group A, which underwent Mulligan's Mobilization with Muscle Energy in addition to conventional therapy and ultrasound therapy, dropped from 5.6±1.23 at pre-test to 3.65±0.87 at post-test, showing a substantial decrease in pain.

Similarly, Group A's SPADI score showed a substantial decrease in shoulder pain and disability ($p<0.001$), improving from 66.3±9.96 at the pre-test to 43.3±10.12 at the post-test. With a p-value of less than 0.001, the mean VAS score in Group B, which underwent Mulligan's Mobilization without Muscle Energy in addition to conventional therapy and ultrasound therapy, dropped from 5.8±1.15 at pre-test to 2.05±1.10 at post-test, indicating a substantial decrease in pain.

Additionally, Group B's SPADI score decreased significantly from 66.5±11.15 at the pre-test to 28.35±10.17 at the post-test, with a p-value of <0.001. By the end of the trial period, both groups' functional impairment and pain levels had improved statistically significantly (Table 1).

Significant differences between the two groups were found by the independent t-test between-group examination of the VAS and SPADI scores. Group A received Mulligan's Mobilization with Muscle Energy in addition to conventional therapy and ultrasound therapy; their mean score on the VAS was 1.95±1.50, while Group B received Mulligan's Mobilization without Muscle Energy in addition to conventional therapy and ultrasound therapy; their mean score was 3.75±1.44. Group A saw a considerably higher reduction in pain than Group B, as indicated by the comparison's p-value of less than 0.001.

In the same way, Group A's mean score on the SPADI index was 22.9±11.7, while Group B's was 38.1±11.7. The comparison's p-value was <0.001, indicating that Group A's shoulder pain and disability had significantly improved compared to Group B's. According to these findings, Mulligan's Mobilization with Muscle Energy outperformed Mulligan's Mobilization without Muscle Energy in terms of pain alleviation and functional enhancement (Table 2).

4 DISCUSSION

In patients with shoulder periarthritis, the current study comparing Mulligan's Mobilization with and without the Muscle Energy Technique (MET) showed notable improvements in pain and impairment in both treatment groups. Shoulder Pain and Disability Index (SPADI) ratings dropped from 66.3 to 43.3 and Visual Analogue Scale (VAS) scores dropped from 5.6 to 3.65 in Group A, who got Mulligan's Mobilization with MET.

Table 1: Comparison of Pre-test and Post-test VAS and SPADI Scores within Groups Using Paired 't' Test

Groups	Treatments	Variables	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	p-value
Group A	Mulligan's Mobilization with Muscle Energy with conventional therapy and ultrasound therapy	**VAS**	5.6±1.231	3.65 ± 0.875	p<0.001*
		SPADI	66.3 ± 9.96	43.3 ± 10.12	p<0.001*
Group B	Mulligan's Mobilization without Muscle Energy with conventional therapy and ultrasound therapy	**VAS**	5.8 ± 1.152	2.05 ± 1.10	p<0.001*
		SPADI	66.5±11.15	28.35 ± 10.17	p<0.001*

*Significant

Table 2: Comparison of VAS Scale and SPADI Index Between Groups Using Independent t-test

Variable	Groups	Treatments	n	Mean ± SD	p value
VAS	Group A	Mulligan's Mobilization with Muscle Energy with conventional therapy and ultrasound therapy	20	1.95 ± 1.50	p<0.001*
	Group B	Mulligan's Mobilization without Muscle Energy with conventional therapy and ultrasound therapy	20	3.75 ± 1.44	
SPADI	Group A	Mulligan's Mobilization with Muscle Energy with conventional therapy and ultrasound therapy	20	22.9 ± 11.7	p<0.001*
	Group B	Mulligan's Mobilization without Muscle Energy with conventional therapy and ultrasound therapy	20	38.1 ± 11.7	

*Significant

Similarly, the VAS ratings of Group B, which was given Mulligan's Mobilization without MET, decreased from 5.8 to 2.05, and the SPADI scores decreased from 66.5 to 28.35. Group B had marginally better results in terms of pain reduction and functional improvement, even though both groups showed noticeable improvements. Mulligan's Mobilization is well known for its capacity to improve shoulder dysfunction, especially in diseases like periarthritis of the shoulder, in terms of discomfort, range of motion (ROM), and functional ability. Mulligan's Mobilization has been shown to significantly relieve pain and range of motion in a number of investigations, including one by Meena and Varghese.[9] These findings are supported by the current study, which demonstrates significant drops in both groups' VAS and SPADI levels, demonstrating the efficacy of this method. It has been discovered that Mulligan's Mobilization, when combined with Muscle Energy Technique (MET), improves shoulder function. Jaiswal et al. discovered that ROM and SPADI scores significantly improved when MET and Mulligan's Mobilization were combined.[10] The current study confirmed these findings, as Group A, which received Mulligan's Mobilization with MET, also showed notable improvements, reinforcing the efficacy of the combined approach.

In the current study, Group A showed a significantly lower Visual Analogue Scale (VAS) score of 1.95±1.50 compared to Group B's score of 3.75±1.44 (p<0.001), highlighting a more substantial reduction in pain for those who received Mulligan's Mobilization with MET. This result is consistent with studies indicating that mobilization techniques, including Mulligan's, are effective in reducing pain in conditions such as adhesive capsulitis.[10,11] The addition of MET appears to further enhance the efficacy of Mulligan's Mobilization in managing pain, offering a potential advantage for improving patient comfort. In terms of functional improvement, the Shoulder Pain and Disability Index (SPADI) scores demonstrated a notable difference between the groups. Group A had a mean SPADI score of 22.9±11.7, significantly lower than Group B's score of 38.1±11.7 (p<0.001). This indicates that patients in Group A received Mulligan's Mobilization with MET, experienced greater improvements in shoulder function and reduced disability. Literature suggests that combining mobilization with MET enhances functional outcomes, as seen in other studies on adhesive capsulitis.[10,12] The integration of MET with Mulligan's Mobilization may provide synergistic benefits for improving shoulder mobility and overall functionality.

The current findings emphasize the benefits of Mulligan's Mobilization with the MET, and some studies suggest that mobilization alone can also yield significant improvements in pain and function. This raises the question of whether the addition of MET is necessary for all patients or whether

mobilization alone can be equally effective in certain cases. Further research is needed to explore the optimal treatment combinations and individual patient factors that may influence the choice of technique for managing shoulder conditions. This would help establish more precise treatment protocols for conditions like periarthritis of the shoulder and provide clearer guidance on the most effective approaches for different patient profiles.[12] Future research should focus on evaluating the long-term benefits of these techniques and establishing treatment protocols tailored to different patient populations.

5 CONCLUSION

Mulligan's Mobilization with and without Muscle Energy Technique (MET) demonstrated significant improvements in pain and functional mobility in patients with periarthritis of the shoulder. However, the combination of Mulligan's Mobilization with MET led to superior outcomes, with a more significant reduction in pain and better functional improvement than mobilization alone. These findings highlight the potential benefits of integrating MET into treatment protocols to enhance shoulder function and pain relief in patients with frozen shoulder.

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