

Age and gender-based correlation with the outcomes following manipulation under anesthesia in adhesive capsulitis

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ABSTRACT:

Background: Adhesive capsulitis is a partially understood condition which severely affects the glenohumeral joint leading to severe impairment of the functions. Manipulation under anesthesia is an effective treatment modality for the individual who have failed the conservative treatment. However, the association of demographic factors like age and gender with the outcomes of manipulation under anesthesia is not much defined. The objective of this study is to evaluate the functional outcomes of manipulation under anesthesia and to study the association between its effects and the demographic factors like age and gender. **Methods:** It is a prospective hospital based interventional study where patients from 40-70 years of age who remained symptomatic despite 3 months of conservative treatment were included. Patients underwent manipulation under anesthesia and were discharged the next day which was followed by the structured physiotherapy. Patients were followed up and serial SPADI index was compared to the pre procedural SPADI index to determine the association of age and gender with the manipulation under anesthesia. **Results:** MUA has significantly improved the functions of shoulder joint which was reflected by the improvement in the SPADI index at different follow-ups. There was no association found between the gender and the outcomes of the manipulation under anesthesia where patients from both young and older age groups showed promising results over time. **Conclusion:** MUA is an effective modality which significantly improves the symptoms of adhesive capsulitis. The outcome of the study is independent of age and gender suggesting these variables should not be considered as an exclusion criterion for the procedure.

Keywords: Adhesive capsulitis, age, gender, manipulation under anesthesia

INTRODUCTION:

Adhesive capsulitis is defined as the global restriction of movements of shoulder joint during both active and passive phase most commonly affecting females (Manske RC and Prohaska D, 2008) and middle to later age groups of life. There is generally no radiographic abnormality (Zuckerman JD and Rokito A, 2011), and it adversely affects the quality of life due to significant pain and decreased range of motion.

Being a mostly ill understood and self-limiting disorder, it has a long natural history that progress and resolves over months to years. Treatment is challenging and initially it includes the conservative management by implementing the use of NSAIDS, tailored physiotherapy. Individual experience to the response differs as a large amount of population is not relieved of pain and don't show the satisfactory relief.

This study includes is based on manipulation under anesthesia as a treatment option which has shown the

favorable impact on the patient's outcomes. Procedure involves the manually breaking the adhesions during manipulation under controlled environment followed by tailored physiotherapy. Clinically patient usually experience pain in the involved shoulder joint at the site of insertion of the deltoid.

Manipulation under anesthesia response is notably found to differ in different patient subsets suggesting various patient related factors influencing the outcomes. Among such factors age and gender and commonly found variables that may alter the treatment and sometimes even the compliance of the patient regarding the post-operative management.

Shoulder pain and disability index includes the pain and disability parameters and quantifies the disability in adhesive capsulitis. It is a widely used parameter for various research purposes.

The present study is prospective hospital-based intervention which evaluates the results of MUA in

adhesive capsulitis and defines the association of outcomes with the age and gender helping to improve the clinical decision making and management in adhesive capsulitis.

MATERIALS AND METHOD:

This study was done in government medical college Jammu from 1st of august 2023 to 31st of July 2024 and it was a prospective hospital based interventional study. Ethical clearance and informed consents were taken before enrollment in study.

A total of 37 patients were enrolled who were diagnosed as adhesive capsulitis in outpatient department meeting the inclusion and exclusion criteria.

Inclusion criteria included age from 40-70 years where both males and females were recruited who had both passive and active glenohumeral movements restriction in >30 degrees of abduction and one additional plane movement restriction by >30 degrees when compared to contralateral shoulder. There patients failed to the minimum of 3 months conservative management with the history of pain and stiffness of at least 6 months.

Age <40 and >70 was excluded from the study. Additionally, patients suffering from any bony lesion on x-rays, tuberculosis, tumor, rheumatic disease were also excluded. Along with these, patients with significant comorbidities which hampered the anesthesia procedure were also excluded. Recently healed fractures and non-consenting were not recruited.

The selected patients underwent manipulation in controlled setup where proper care was taken to avoid any complications by the orthopedic surgeon.

Post procedural patients were advised the tailored home-based exercise of shoulder joint helping them improve their ang of motion and recovery. Patients and the family members were counselled regarding the exercises and the outcomes.

On follow-up SPADI index was compared to the pre procedural SPADI index. Post procedural SPADI index was noted at one week, two weeks, one month, three-month, six months.

Statistical analysis was done using statistical software. Mean and standard deviation was taken, and categorical variables were expressed with frequency and percentage. SPADI index was analyzed over time using repeated measure ANOVA. Chi square test was used to study the association between age and gender where a p value <0.05 was considered statically significant.

RESULTS:

This study included 37 patients who underwent the manipulation under anesthesia for adhesive capsulitis. Patients of age group 40 -70 years were recruited comprising of both male and females where both the genders were adequately represented for analysis as per the study protocol.

Point of time of assessment	N	Mean	Std. Deviation	Statistical Significance	
				F-value	p-value
PRE-PROCEDURE SPADI INDEX (2)	37	.773	.0902	272.808	<0.0001
ONE WEEK SPADI INDEX (3)	37	.573	.0902		
2 WEEKS SPADI INDEX (4)	37	.524	.0760		
ONE MONTH SPADI INDEX (5)	37	.459	.0686		
3 MONTHS SPADI INDEX (6)	37	.338	.0828		
6 MONTHS SPADI INDEX (7)	37	.259	.0956		

Pre procedural SPADI index was noted and there was no significant difference in relation to age groups and even in relation to the gender.

The mean SPADI index when measured at progressive follow-up at 1 week, 2 weeks, 1 month, 3 month and 6 month, showed marked improvement which was demonstrated by repeated measure ANOVA with statistically significant (p<0.001), implying the improved functional recovery after the procedure.

Age	Outcome Score		Total	Statistical Significance	
	0.1	≥0.2		Chi. Sq. Value	p- value
>55	4	19	23	0.782	0.377
≤55	1	13	14		
Total	5	32	37		

All the patients were assigned the specific age groups and SPADI index on follow up showed the significant improvement in shoulder range of motion and decreased pain irrespective of the age groups in question. This suggests that the age does not influence the effectiveness of the procedure done for adhesive capsulitis in this study. This was also supported by the statistical analysis with ($p > 0.05$).

Gender	Outcome Score		Total	Statistical Significance	
	0.1	≥0.2		Chi. Sq. Value	p- value
F	3	17	20	0.082	0.774
M	2	15	17		
Total	5	32	37		

Similarly, at different follow ups, it was statistically suggested that there is no significant difference in outcome between the gender at pre procedural phase or during follow-up assessments which is evident by ($P > 0.005$). There were also no complications found associated with the procedure.

DISCUSSION:

Frozen shoulder is a condition which severely affects the patient with disabling pain and functional limitation at glenohumeral joint. Treatment of adhesive capsulitis includes the initial conservative management, but patient generally fails to the conservative management which warrants some intervention to be done for better relief of the patients. MUA is widely accepted treatment option for such patients. This study is a hospital based prospective interventional study which is based on the SPADI index at different follow-ups. It showed the positive results reflected at different follow-ups. These results are consistent with the prior studies demonstrating improved shoulder ROM.

This study analyzed that there is no statistically significant association between age and outcomes of procedure at different follow-ups suggesting age alone may not determine the functional recovery of the symptoms when standardized protocols were applied. Although there is not much evidence in the literature regarding the influence of age on the outcomes yet **Wang JP *et al.*, (2010)** studied the 63 shoulders where there was also no statistically significant association was found between pre procedural to post procedural outcomes after MUA.

The result of this study is also consistent with **Theodorides AA *et al.***, where he studies 295 patients he found the similar research.

In this study the association of gender was also studied and it was analysed that gender also has no statistical significance with the outcomes of manipulation under anesthesia when compared at different follow-ups. Although There is very little evidence in the literature regarding this yet the result of this study is consistent with **Wang JP *et al.*, (2010)** where he also found the similar results.

CONCLUSION:

This study concludes that MUA is an effective modality of treatment in improving the functional outcomes of adhesive capsulitis resulting in overall improved range of motion and pain.

Additionally age and gender are not the limiting variables for selection of the patients of adhesive capsulitis for manipulation. Patients from both the younger and older age groups are expected to gain significant and meaningful improvement in symptom. Also there is a need of superior comparative study with larger sample size to further understand the association between the two variables.

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