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Comparison of Cryokinetics and Ultrasound Therapy in Treatment of acutesupraspinatus Tendinitis

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ABSTRACT
The treatment of SST is mainly aimed at elevation of pain. Although non-steroidal anti-inflammatory drugs (NSAIDS) are widely used to treat the pain with SST, the highincidence of side effects with NSAIDS can limit their use. To avoid or to reduce the sideeffectsassociatedwithNSAIDS,physicaltherapysuchasCryokinetics,ultrasoundtherapy, short wave diathermy, laser are frequently used. It has been cited that use ofcryotherapyandUShasbeenproventocontrolthepainandtopreventdisability. This paper makes a comparison of cryokinetics and ultrasound therapy in treatment of acute supraspinatus tendinitis. The data of 60patients were used and analysed with the statistical tool, one sample t test and revealed that the Cryokinetics is better for treatment of acute supraspinatus tendinitis.

Keywords: Cryokinetics, Ultrasound, Acute Supraspinatus Tendinitis.

I. INTRODUCTION

SupraspinatustendinitiswasproposedbyNEER[22]in1972asaclinicalentityinwhichthe rotator cuff was pathologically compressed againstanteriorstructureofcoraco-acromialarch, anteriorthirdoftheacromion, thecoracoacromialligamentand aacromiaclavicularjoint. Supraspinatus probably had the most written on it in regards to the impingementsyndrome and related shoulder pathology. It can be affected by trauma but also undergoes chronic degenerative changes leadingto tendinopathies and rupture.Supraspinatus tendinitis is a painful lesion of the supraspinatus tendon; here the pain is located over the lateral aspect of arm with well-defined trigger points on the muscle bellyover the supraspinatus notch and at the insertion.A narrowing of the subacromial outlet by spur formation in coraco acromial ligamentand the under surface of the anterior third of acromion define the relative progression ofthe impingement syndrome[2]. All of these factors results in increase in pressure on therotator cuff, which can lead to chronic wearing and subsequent tearing of the rotator cufftendon.

Supraspinatus, infraspinatus and the subscapularis muscle comprise the rotator cuff ormusculotendinous cuff. These muscles are considered to be a part of the cuff because theinserting tendons of each muscle of the cuff blend with and reinforce the glenohumeralcapsule, most importantly all these have action lines that significantly contribute to thedynamicstability of glenohumeral joint.[3]Supraspinatuscanalconnectssupraspinatusfossawithasubdeltoidregionandisbounded posteriorly by spine of the scapula and the acromion, anteriorly by coracoidprocessand superiorly bycoraco-acromial ligament.The SST canal forms a rigid and inextensible ring, if the muscle increases in size as aresult of scar or an inflammatory process, it cannot glide through the canal withoutstickingandcausingpain.When the rotator cuff is damaged, the degenerated and ruptured supraspinatus tendon nolongerliesbetweenthehumeralheadandthecoraco-acromialarch.Directcontactbetween these two structures is responsible according to modern authors for the painassociatedwith abduction in the syndrome of rotator cuffrupture.[4]Shoulderpainisthe3rdmostcommoncauseofmusculoskeletaldisorderafterlowback pain and cervical pain. The annual incidence is estimated at 10 cases per 1000population, peaking at 25 cases per 1000 population in a age category of 42-46 years.[23-24]Incadaverstudies,theincidenceoffullthicknesstearvariesfrom18-26%.Theincidence of partial thickness tear varies from 32-37% after age 40 years. In a study it is found thatboth males and females are equally affected with supraspinatus tendinitis.

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Rotator cuffdiseaseismorecommonafterageof40years. Various studies have shown the medical and surgical interventions in treatment ofSST.MedicalinterventionslikeNon-steroidalanti-inflammatorydrugs(NSAIDS),SubacromialcorticosteroidsandBupivacainesuprascapularnerveblock.SurgicalinterventionslikeArthroscopicsub-arominoplasty,Electrothermalarthroscopiccapsulorrhaphy,subacrominaldecompressionandforsecondary impingementthesurgicaltreatment is stabilizationprocedure a Capsulorrhaphy is done.

METHOD:

For this study, 60 patients with SST of both sex were taken. Patients were randomlydividedintogroupAandgroupB.GroupAweretreatedwithcryokineticsfor30minutes. Group B were treated with US therapy for 8 minutes. Both the groups weretreated 5 times per week for three weeks. Patients were evaluated with VAS and 1 RM onday1st, 15th dayandendofthirdweek.The values were compared to see which group has better improvement. The values arestatistically analyzed to determine their effect in reducing pain and improving musclestrength.

STATISTICAL SOFTWARE:

TheStatisticalsoftwarenamelySPSS22.0,Stata8.0,MedCalc9.0.1 andSystat11.0 wereusedforthe analysisofthedata andMicrosoftwordand Excelhavebeenusedtogenerategraphs,tables etc.

METHODOLOGY:

ResearchDesign -

Itis aComparativeEvaluationStudy.

Population-

Patientswith acute supraspinatus tendinitis.

SampleSize-

60 patients withacute supraspinatustendinitis,residinginUdaipur.

SamplingMethod -

Randomsamplingmethod

SamplingTechnique-

Samples are selected through random sampling by using chit method First prepare 60chits(30ineachgroup),placetheminbox,shuffleateachtimeandaskthepatienttopickonechit.Whicheverg roupselectedbythepatient,asfoundonthechit,isallocatedtothatpatient.Donotreplacetheselectedchitsbackintothebox.

SourceofData -

AllpatientscomingtoPACIFIC MEDICAL COLLEGE AND HOSPITAL, PACIFIC COLLEGE OF PHYSIOTHERAPY with clinical diagnosis of supraspinatus tendinitis by an orthopaedicianand who are fulfilling the inclusion and exclusion criteria.

Statistical software:

The Statistical software namely SPSS 22.0, Stata 8.0, MedCalc 9.0.1 and Systat 11.0 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

InclusionCriteria-

1. Subjectswith supraspinatus tendinitis who are under analgesics.
2. Agegroup:30-50yrs.

ExclusionCriteria hasAdhesive capsulitis, Cervicaldisorders, Fibromyalgia, RheumatoidArthritis, Hemiplegia, Thoracic outlet syndrome, Coldhyper-sensitivity,haemoglobineuria, Anestheticskin, Cardiacconditions and Cold utricaria

MaterialsUsed includes Cold pack, Ultrasoundmachine, Ultrasonicgel, VAS, Cotton, Weightcuff and Cord.

StudyDesign:AComparativeevaluationstudywith60 patientswithacuteSupraspinattusTendinitiswith30patientsinGroupA(CRYOKINETICS)and30patients in Group B (ULTRSOUND THERAPY) is undertaken to study the EffectivenessofCryokineticsincomparisonwitheffectivenessofUltrasound Therapy

II. DATA ANALYSIS

Table 1 presents gender wise comparison of the patients studied:

Table1:Genderdistributionofpatientsstudied

Gender	GroupA		GroupB	
	No	%	No	%
Male	14	46.7	16	53.3

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Female	16	53.3	14	46.7
Total	30	100.0	30	100.0

SamplesaregendermatchedwithP=0.605

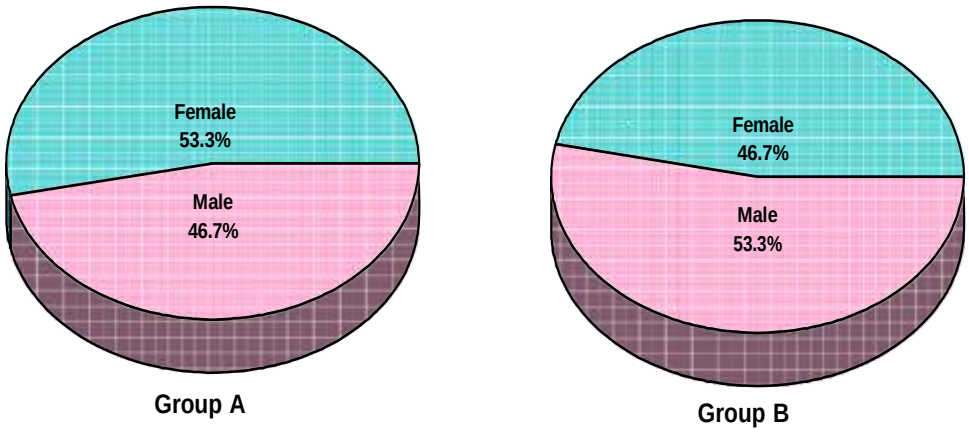

Table 1explainsthegenderdistributionofpatientsingroupA&B. GroupAhas14numberofmalesthatis46.7%&16numberoffemalesthatis53.3%groupBhas16numberofmalesthatis53.3%and14numberoffemalesthatis46.7%. Inthis diagramsamplegender is matchedwith p= 0.605

Table2: Comparisonof VASscore between twogroups ofpatients (n=30)

VAS	Day1	Day15	3rd week	% changeat 3rd week
GroupA				
Nopain	0	0	6(20.0%)	+20.0%
MildPain	0	15(50.0%)	24(80.0%)	+80.0%
Moderatepain	12(40.0%)	14(46.7%)	0	-40.0%
Severepain	18(60.0%)	1(3.3%)	0	-60.0%
GroupB				
Nopain	0	0	0	0.0
MildPain	0	3(10.0%)	12(40.0%)	+40.0%
Moderatepain	12(40.0%)	24(80.0%)	17(56.7%)	+16.7%
Severepain	18(60.0%)	3(10.0%)	1(3.3%)	-56.7%

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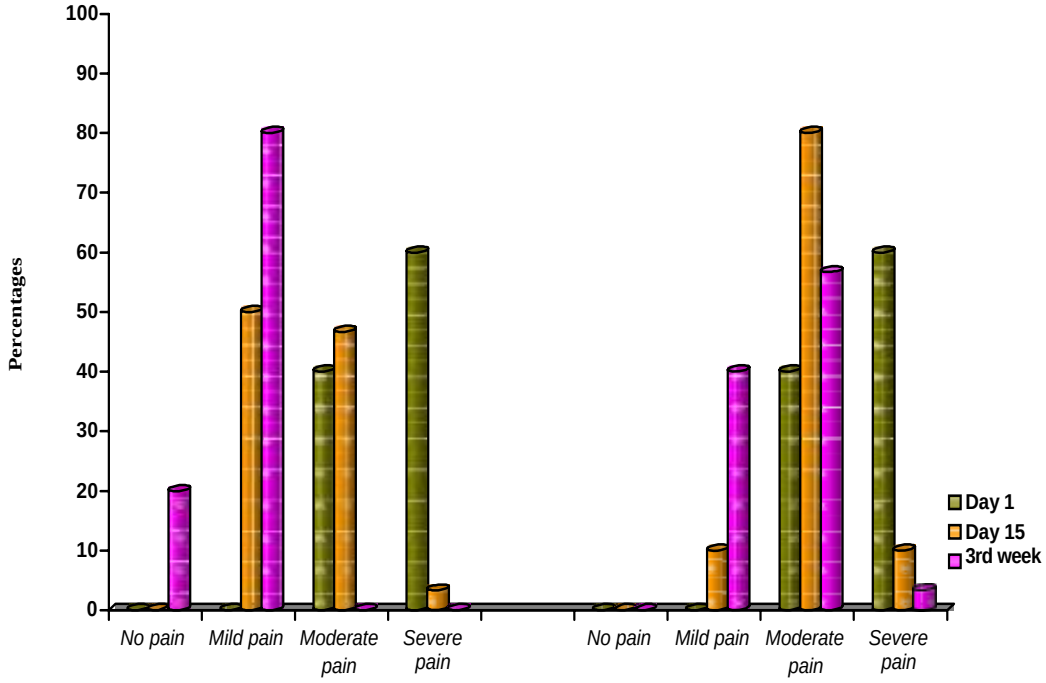

Table 2 showsthe comparisonof VASbetween two groupsof patients.IngroupA– onday1st therewere12patientswithmoderatepainwhichwasmeasuredby VAS & 18 patients with severe pain.Onday15th therewere15patientswithmildpain& 14withmoderatepainand1patientwithseverepain.Attheendof3rd weektherewere6patientswithnopain,24withmildpain.

IngroupB– onday1st therewere12patientswithmoderatepainand16withseverepain.Onday15th therewere3patientswithmildpainand24patientswithmoderatepainand3patientswithseverepain.Attheendof3rd weektherewere12patientswithmildpainand17patientswithmoderate Pain and 1 with severe pain.

Table3: Comparison ofVAS score in twogroups of patients

VAS	GroupA	GroupB	P value
Day1	6.90±1.58	6.70±1.51	0.619
Day15	3.73±1.17	5.20±1.29	<0.001**
3rd week	1.23±0.86	4.03±1.38	<0.001**

Table explainsof VAS score in two groups of patients.On day 1-group Ahad 6.90+/- 1.58and groupBhad 6.70+/- 1.51, witha Pvalueof0.619. Onday15grouphad3.73+/-1.17andgroupBhad5.20+/-1.29withaPvalueof<0.001. At theendof 3rd weekgroup Ahad1.23+/-0.86 andgroupB had4.03+/-1.38witha P value of <0.001.

Table4:Comparisonofrepetitionsmaximumbetweentwogroupsofpatients

RM	Day1	Day15	3rd week	% changeat3rd week

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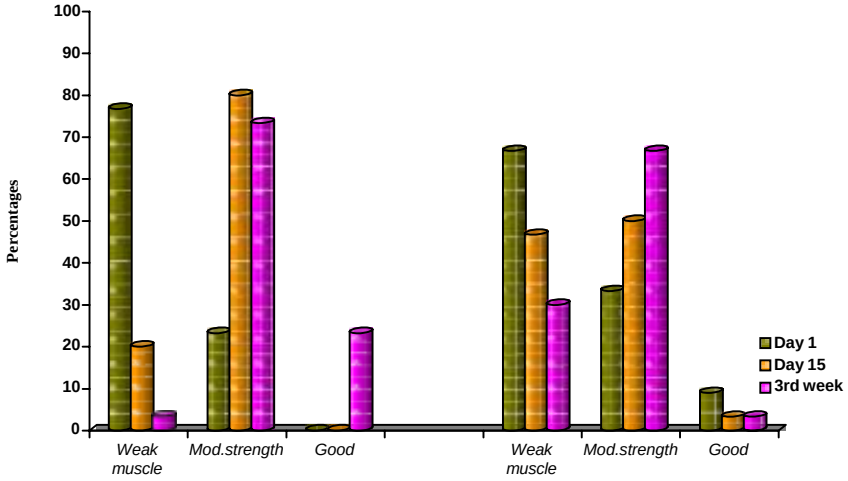
GroupA				
Weak muscle	23(76.7%)	6(20.0%)	1(3.3%)	-73.4%
Mod.strength	7(23.3%)	24(80.0%)	22(73.3%)	+50.0%
Good	0	0	7(23.3%)	+23.3%
GroupB				
Weak muscle	20(66.7%)	14(46.7%)	9(30.0%)	-36.7%
Mod.strength	10(33.3%)	15(50.0%)	20(66.7%)	33.4%
Good	0	1(3.3%)	1(3.3%)	+3.3%



TablereveledComparisonofrepetitionmaximumbetweentwogroupsofpatients.IngroupAonday1therewere23patientswithweakmuscleand7patientswithmoderate strength. Onday15th therewere6patientswithweakmuscleand24withmoderatemusclestrength.Attheendof3rd weektherewasonlyonepatientwithweakmuscle,22patientswithmoderatestrengthand 7 with good muscle strength.IngroupBondayt1therewere20patientswithweakmuscle,10withmoderatemusclestrength.Onday15th therewere14patientswithweakmuscleand15patientswithmoderatemuscle strength and 1 with good muscle strength.Attheendof3rd weektherewere9patientswithweakmuscle,20patientswithmoderatemuscle strength and 1patient with good muscle strength.

The differences in the same is measured with the one sample t test for the comparison of cryokinetics and ultrasound therapy in treatment of acute supraspinatus tendinitis

Table-5: Independent sample t test

Group Statistics					
	VAR00001	N	Mean	Std. Deviation	Std. Error Mean
Cryokinetics	Cryokinetics	9	10.0000	7.93725	2.64575
	Ultrasound	9	10.0000	10.14889	3.38296

Independent Samples Test						
		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Cryokinetics	Equal variances assumed	1.278	.275	2.000	16	0.000
	Equal variances not assumed			2.000	15.122	0.000

The results of the test revealed with the value of Sign for equal variance assumed column that the difference in the recovery of the patient is significant and the mean value of the both the methods Cryokinetics and Ultrasound is similar hence the judgement criteria is the Std. Deviation which revealed that the Cryokinetics is better for treatment of acute supraspinatus tendinitis.

III. DISCUSSION:

This study was undertaken to study the effectiveness ofCryokineticsin comparison with effectivenessofUltrasoundtherapy. It is based upon the Rotatorcuffinjury thatisoneoftheoccupationalhealthproblems. It has onorthopedicambulatorywith high functional damage to its carrying. Thisstudy aimed tocomparethesetwointerventionsinreducingpainandincreasingmusclestrengthandenhancing functional performance in SST. It presented a comparative evaluation study with 60 patients with acute supraspinatus tendinitiswas undertaken. 60 patients were divided into two groups, group A and group B. Eachgroup consisting of 30 patients. Group A received Cryokinetics therapy and group Breceived ultrasound therapy. The group analysis results that GroupAwastreatedwithcryokineticsandgroupBwastreatedwithUStherapy.GroupAhasbeen shownmoreimprovementthangroupB,whichisproved statistically.

IV. CONCLUSION:

The conclusion of the paper revealed that thegoodimprovementofVASscaleisseeninGroupApatients.Thegoodimprovementof1RMisseeninGroupApatients,
ThestudyconcludedthatCryokineticsgivesbetterresponseandismoreeffectivethanUSinreducingpainandenhancingfunctionalperformanceinSSTpatients.Thegoodimprovement
ofVASand1RMisseenintheagegroupof31-40years.

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