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RESEARCH ARTICLE

THE EFFICACY OF DYNAMIC TAPPING IN PATIENTS WITH TENNIS ELBOW A STUDY OF RANDOMISED CONTROLLED TRIAL

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Abstract

The purpose of the study is to evaluate the efficacy of Dynamic taping in conjunction with conventional physiotherapy compared to conventional physiotherapy alone for tennis elbow.

Objectives: To evaluate pain intensity at rest, during forceful wrist extension, during forceful grip, during the Cozen test, at resisted middle finger extension, and during palpation of the affected site, both before and after conventional physiotherapy combined with Dynamic taping, as well as conventional physiotherapy alone, in patients with tennis elbow.

Methodology: 70Individuals diagnosed with tennis elbow were directly Selected from the physiotherapy outpatient department at CMJ University, Meghalaya. 60 participants were deemed suitable for the study and were randomly allocated to two groups: Group A and Group B. In Group A (Experimental group), 30 patients received both dynamic taping and conventional physiotherapy, while Group B (Control group) consisted of 30 patients who received only conventional physiotherapy. The Visual Analogue Scale was employed to assess pain severity in various functional positions. An independent t-test was used to compare the results.

Results: Following Treatment, the study revealed that the experimental group exhibited a notable enhancement in pain associated with forceful wrist extension ($p<0.05$), pain during vigorous grip ($p<0.05$), pain on the Cozen test ($p<0.05$), pain during forceful middle finger extension ($p<0.025$), and pain upon palpation ($p<0.025$). In instances of resting discomfort, a substantial reduction in pain intensity was not observed.

Conclusion: This experimental investigation demonstrates that the application of Dynamic taping in conjunction with conventional physiotherapy is more efficacious than conventional physiotherapy alone for patients suffering from tennis elbow.

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Introduction:-

Tennis elbow is a prevalent cause of elbow and forearm pain encountered in clinical practice, typically associated with repetitive wrist or finger extension and gripping activities.This condition is characterised by a degenerative or inadequate healing response of the tendon, manifesting as pain at the lateral epicondyle, exacerbated by contraction of the extensor carpi radialis brevis (ECRB). It involves an increased presence of fibroblasts, vascular hyperplasia, and disorganised collagen, primarily affecting the ECRB, which is the most commonly impacted structure. The condition is typically associated with business or sports, frequently resulting from excessive rapid, repetitive, and monotonous contractions and gripping activities of the wrist. The dominant arm is typically affected, with a frequency of 1–3% in the general population.

The upper limb is crucial in daily activities, with the hand serving as the effector organ that provides mechanical support and enables optimal positioning for various actions from a functional perspective (Puranik, 2009).

Tennis elbow is one of the most prevalent disorders affecting the upper limb (Jones, 2009). Ebnezar (2003) asserts that painful elbow syndrome encompasses lateral, medial, and posterior elbow symptoms, with lateral tennis elbow, resulting from repetitive stress, being particularly prominent. Lateral epicondylitis is a painful and incapacitating musculoskeletal condition.

A disorder marked by lateral elbow pain significantly affects society and poses challenges to the healthcare sector (Bisset et al, 2005). Lateral epicondylitis, commonly known as tennis elbow, has been acknowledged for more than a century and is classified as an enthesopathy of the common extensor origin at the elbow (Crowther et al, 2002). The term lateral epicondylitis originated from the condition known as writer's cramp and was first identified by Mr. Runge in 1873 (Sharath, 2005).The designation "tennis elbow" was first introduced by Morris in 1882, while a comprehensive description of the ailment was provided by Momberg in 1910 (Zeisig, 2008). Tennis elbow is a commonly utilised clinical model of musculoskeletal pain in rehabilitation (Shamsoddini et al, 2010), managed by numerous physical therapists across diverse clinical environments.The effective conservative treatment of lateral epicondylitis typically seeks to alleviate pain, regulate inflammation, enhance healing, improve both local and overall fitness, and manage forceloads (Noteboom et al, 1994). The application of dynamic tape is advocated as a method to decrease pain, enhance muscle function, and restore functional movements. Dynamic Taping enhances adherence to exercise rehabilitation programs by reducing symptom exacerbation during therapeutic exercise execution (Vicenzino et al, 2003). The purpose of taping is to support a compromised body part without restricting its function, by inhibiting motions that could strain the affected area, with the primary aim of offering a semi-rigid or stiff splint over a joint or adjacent tissue (Sharath, 2005). Vicenzino and Wright (1995) assert that clinicians face challenges in treating tennis elbow, as many prevalent treatments lack empirical validity. Jones (2009) asserted that other treatments, including physiotherapy, have been suggested in this context.due to insufficient comprehension of its etiology. As many as 30% of individuals with tennis elbow are referred to physiotherapy in primary care settings. Ebnezar (2003) categorised physiotherapy interventions for tennis elbow based on the acute and post-acute phases.

Amro et al. (2010) delineated conventional interventions, encompassing NSAIDs, corticosteroid injections, cryotherapy during the acute phase, succeeded by heat application in the chronic phase, friction massage, rest, ultrasound (US), acupuncture, electrical stimulation, laser therapy, counterforce bracing, shock wave therapy, lateral extensor release, along with progressive strengthening and stretching exercise therapy.Dunkowet al.(2004) proposed that early treatment involving rest, activity modification, local splints,and steroid injections is sufficiently beneficial for, tennis elbow.

Lateral epicondylitis, also known as tennis elbow, is a painful and debilitating ailment of the elbow that disrupts functional tasks. Literature indicates that discomfort and dysfunction are prevalent in lateral epicondylitis, which might hinder an individual's capacity to perform at work and engage in recreational activities, thereby imposing a financial burden on the community. Effectivemanagement of tennis elbow cases is crucial.The incidence of tennis elbow is greater among individuals engaged in highly repetitive occupations. In our country, individuals' low socio-demographic status and work stress exacerbate the recurrent microtrauma of lateral epicondylitis, resulting in a chronic inflammatory illness. Numerous physical therapy techniques are available for the treatment and rehabilitation of tennis elbow, and some research indicates that taping is a significant intervention for this condition, as it alleviates

stress on the forearm extensor and lateral epicondyle during activity, thereby preventing further injury. This study aims to assess the efficacy of dynamic tapping combined with conventional physiotherapy vs conventional physiotherapy alone for patients with tennis elbow.

Aim of the Study:-

This study aims to assess the efficacy of combined therapy, using taping alongside conventional physiotherapy, against conventional physiotherapy alone in patients with lateral epicondylitis (Tennis Elbow).

Study Objectives:-

1. To evaluate the pain intensity at rest prior to and following standard physiotherapy with taping and traditional physiotherapy alone in people diagnosed with tennis elbow.
2. To comprehend the efficacy of taping exclusively.
3. To compare the efficacy of elbow taping with the absence of wrist management as an additional therapy.
4. To evaluate pain intensity during a firm grip both prior to and following standard treatment with taping and traditional physiotherapy alone in persons with tennis elbow.
5. To assess pain intensity during palpation of the afflicted side both prior to and following standard physiotherapy involving taping and conventional treatment for tennis elbow.

Research Methodology:-

This study will quantitatively analyze the link between activity projects including dynamic taping and exercise for the pain management of patients with tennis elbow. To evaluate the efficacy of this therapy method, the Visual Analogue Scale (VAS) will be employed as a tool for assessing pain severity in various functional positions.

Studydesign

The research employed a quantitative true experimental design with two distinct subject groups. A true experimental design is a methodology for hypothesis testing that enables the establishment of causality. The study employed a true experimental design with diverse subjects. Both groups underwent an identical treatment protocol with the exception of one intervention. Only the experimental group had dynamic tapping, whilst the control group received only conventional physiotherapy treatment. A pre-test (before to intervention) and post-test (subsequent to intervention) were conducted with each participant in both groups to evaluate the pain effects before and after the treatment.

Study Population

A populace refers to the entire collection of individuals or entities that match the criteria established by the researcher. The subjects of this study will be patients with tennis elbow.

Sample Selection

Participants who fulfil the eligibility requirements will be selected as the sample for this study. Seventy people diagnosed with tennis elbow were directly picked from the physiotherapy outpatient department at CMJ University, Meghalaya. Sixty participants were deemed suitable for the study and were randomly allocated to two groups: Group A and Group B. In Group A (Experimental group), 30 patients received both dynamic taping and traditional physiotherapy, while Group B (Control group) consisted of 30 patients who received only conventional physiotherapy. The visual analogue scale was employed to assess pain severity in various functional positions. The unrelated "t" test was conducted.

Inclusion Criteria

1. The members will consist of individuals who have undergone physiotherapy treatment and completed at least four sessions.
2. Subject with no prior history of physiotherapy, oral NSAIDs, or corticosteroid infusion.
3. The members who will exhibit no deformation of the affected elbow and wrist.
4. Voluntary participants.
5. Agegroup:20-60yearsofageofbothgenders.

Exclusion Criteria

1. Subjects who will not have completed four sessions of physiotherapy treatment.

2. Patients with clinical conditions that may worsen with tapping, such as skin disorders, dermatitis, or eczema.
3. Subjects exhibiting any deformity in the affected elbow and wrist.
4. Subjects who exhibit unwillingness to engage.

Datacollectiontools

1. Acomposedsurvey,
2. Pen,paperand
3. Dynamic tapeswillbeutilizedasinformationcollectiontoolsinthisstudy
4. Questionnaire

The poll will be established with the manager's guidance and consent, adhering to specific regulations. There will be six closed-ended questions utilising a visual analogue scale (VAS), each designed to differentiate pain levels associated with various actions, and all enquiries will pertain to pain and disability.

Measurement Tool

The analyst will employ the Visual Analogue Scale (VAS) to assess pain severity in this investigation. The VAS is a simple and precise technique for assessing pain emotions along a continuous visual spectrum. The Visual Analogue Scale (VAS) consists of a linear continuum upon which the respondent indicates the intensity of pain experienced. The components of the pain scale range from 0, indicating no pain, to 10, representing the most excruciating suffering imaginable. Myles (1999: 1517) states that the visual analogue scale (VAS) is a tool commonly employed to assess pain, and a modification in the VAS score signifies a relative alteration in the intensity of pain perception.

Data Collection Procedure:-

The study strategy will focus on patient evaluation, early documentation, therapy, and final documentation. Following the patient's screening at the division, they will be assessed by a competent physiotherapist. Each subject will receive four therapy sessions.

Participants who fulfil the eligibility requirements will be selected as the sample for this study. 70 people diagnosed with tennis elbow were directly picked from the physiotherapy outpatient department at CMJ University, Meghalaya. 60 individuals were deemed suitable for the study and are randomly allocated into two groups: Group A and Group B.

In Group A (Experimental group),30 patients received both dynamic taping and traditional physiotherapy,while Group B (Control group) consisted of 30 patients who received only conventionalphysiotherapy.

Data will be collected via a pre-test, intervention, and post-test, use a structured questionnaire designed by the researcher. A pretest will be conducted before to the initiation of treatment, and the level of pain will be recorded using a Visual Analogue Scale (VAS) in a structured questionnaire. A comparable technique will be employed to conduct a post-test regarding the treatment regimen. The scientist provided the appraisal framework to each subject prior to the commencement of treatment and after four treatment sessions, instructing them to identify their pain intensity on the VAS. The analysts will collect data from both the experimental and control groups prior to the certified physiotherapist's involvement to minimise bias. In accordance with the agreement, detailed tests will be conducted for statistical analysis.

Data was obtained via a pre-test, intervention, and post-test utilising a written questionnaire designed by the researcher. A pretest was conducted before to the initiation of treatment, and the pain intensity was recorded using a Visual Analogue Scale (VAS) on a questionnaire.

The identical technique was conducted to administer the post-test following the completion of four treatment sessions. The researcher administered the assessment form to each participant prior to the commencement of treatment and after four treatment sessions, instructing them to indicate their pain severity on the Visual Analogue Scale (VAS). The researcher gathered data from both the experimental and control groups in the presence of a competent physiotherapist to minimise bias. At the conclusion of the investigation, a specific test was conducted for statistical analysis.

Intervention
A standardised intervention program was implemented for both groups, comprising typical physiotherapy techniques such as cryotherapy, stretching and strengthening exercises for the wrist extensor muscle group, deep transverse friction massage, and ultrasonography, which are the most commonly utilised therapies. The experimental group received tapping in conjunction with conventional physiotherapy. The researcher employed the tape technique while standard physiotherapies were administered by a clinical physiotherapist. Prior to using the taping procedure, the researcher has acquired proficiency in the application of tape for tennis elbow. The researcher subsequently applied the tape according to a stringent protocol. Each group received four treatment sessions, with the experimental group undergoing tapping four times. No definitive evidence supports the exact repeat of tennis elbow taping; nonetheless, expert consensus indicates that a minimum of four taping sessions is sufficient for patients to facilitate the healing process.

ConventionalPhysiotherapy:ForBothGroups
1. Cryotherapy
2. Stretching
3. Strengtheningexercisesofwristextensors
4. deeptransversefrictionmassageand
5. ultrasound

ExperimentalGroup:
1. Dynamic Taping
2. ConventionalPhysiotherapy

Cryotherapy:
1. The implementation of local cryotherapy alleviates pain issues in patients with lateral elbow enthesopathy.
2. Following the use of local cryotherapy, individuals with tennis elbow exhibit enhanced mobility.
3. The application of local cryotherapy results in a decrease in analgesic consumption among the individuals examined.

Wrist stretch:
Extend your arm forward with a straight elbow and your palm facing downward. Apply pressure with one hand onto the other until a stretch is perceived in the wrist. Maintain for 10 seconds. Reiterate five times.

Wrist isometrics:
Assume an upright position with your arm supported on a table, allowing your palm to extend over the edge. With your palm orientated downward, apply pressure with your hand against the table without shifting it. Maintain for 10 seconds. Reiterate five times.

Extension eccentrics:
Grasp a light weight with your arm fully extended and your palm orientated downward. Gradually flex your wrist downward and then upward. Reiterate ten times.

Ball compression:
Grasp a soft ball in your hand and exert maximum pressure on it. Maintain for 5 seconds. Reiterate ten times. Perform towel twists by grasping a towel with both hands and twisting it in opposing directions, simulating the action of wringing out water. Maintain for 10 seconds. Reiterateten times.

Resistance Training Activities:
Muscle-strengthening workouts can often be categorised into concentric and eccentric types. In concentric workouts, the muscle contracts, but in eccentric activities, the muscle elongates. An instance of a concentric exercise is grasping a weight and elevating it towards your body. Progressively reducing the weight is an eccentric exercise. Gradually resisting gravity in this manner fortifies the muscles.

Eccentric resistance training exercises:
1. Grasp a weight in your hand.

2. Position the affected arm on a table with the palm facing downward, permitting the hand to extend over the table's edge.
3. Utilize your free hand to extend the afflicted wrist posteriorly to the maximum extent while elevating the weight.
4. Slowly descend the hand holding the weight. Reiterate approximately 10 to 15 times.
5. Following a brief intermission, reiterate this set of exercises two additional times.
6. It is crucial to avoid use excessive weights. The weight should approximate 30% of your maximal capacity. Minor discomfort is acceptable, but excessive tension on the arm should be avoided.

Concentric resistance training exercises:

1. Position the elbow of the affected arm on a table, ensuring the forearm is vertical. Transform your Position your forearm with the palm of your hand orientated away from your body.
2. Grasp a complete bottle with the injured hand.
3. Slowly descend the arm holding the bottle, ensuring that the wrist remains straight. Permit the bottle to descend into your free hand and reposition the affected arm to the vertical beginning position.
4. Transfer the bottle from the free hand to the affected hand.
5. Reiterate approximately 10 to 15 times.
6. Following a brief interval, reiterate this sequence of exercises two further times. It is advisable to perform strengthening exercises three times daily.

Deep transverse friction massage:

Deep transverse frictional (DTF) massage, originally advocated by Cyriax, has undergone minimal research scrutiny. In a four-week treatment duration, 12 sessions of transverse frictions were evaluated against a corticosteroid injection in the randomised controlled trial conducted by Ahmed et al.(2009)

Subjective and objective markers in the steroid group showed improvement after six weeks; however, no differences were observed between the groups at the 12-month follow-up. The scientists determined that friction massage was equally ineffective in treating tennis elbow compared to an injection.

The Cyriax technique and deep friction massage (DFM), also known as cross friction massage, is a form of connective tissue massage developed by James Cyriax. Deep friction massage seeks to maintain the mobility of the soft tissue structures of ligaments, tendons, and muscles. to prevent the formation of adherent scars. Cyriax addresses lateral epicondylitis with deep transverse friction and Mill's manipulation, depending on the procedure employed. In the Cyriax approach, items must be incorporated and utilised in a proper order. Patients are required to participate in the program three times weekly for a duration of four weeks. Deep transverse friction is applied using the thumb's tip. Pressure was applied to the posterior aspect of the teno-osseous junction. It seeks to prevent abnormal fibrous adhesions and scarring.

Ultrasound Therapy:

Should be conducted two to three times weekly for a duration of four weeks. Continuous operation for 10 to 12 minutes.

Dynamic Taping:

Subjects in the Experimental Group received treatment using the Y-shaped dynamic taping technique. Dynamic Tape has undergone comprehensive testing and is endorsed by FICS: The International Federation of Sports Chiropractic (FICS) consists of national chiropractic sports councils globally, individual members, and maintains affiliations with international Organisations in both the chiropractic field and the sports domain. The objective of FICS is to empower athletes to achieve optimal performance.INHERENTLY.

Informed Consent

The researcher obtained consent for participation from every subject. A signed informed consent form was acquired from every participant. The participants were informed of their entitlement to seek an external physician's consultation should they deem the treatment inadequate for managing their condition or if their status worsens. The participants were informed that they had the right to refuse to answer any questions during the study and could withdraw their consent and stop their participation at any moment. Withdrawing from the research will not impact

their treatment in the physiotherapy department, and they will continue to get the same services. Each participant had the option to address their concerns with the top authority or administration of CRP and receive satisfactory answers to their enquiries.

Data Analysis

To ensure the examination possesses certain traits, the relevance of the collected data must be presented in a manner comprehensible to other researchers. The analyst must comprehend the results. The results derived from an investigation in this study will be analysed by statistical methods.

All members will be assigned codes as specified by the group to maintain participant confidentiality. All participants in both the experimental and control groups assess their pain severity using a visual analogue scale prior to the commencement of therapy and following its completion. The difference in pain intensity between pre-test and post-test scores distinguishes the two groups.

Experimental investigations employing a distinct subject design, with two groups tested under two different conditions, with interval or ratio data, should be analysed using an independent t-test. This study will be experimental, featuring distinct groups of diverse subjects who will be randomly assigned to either conventional physiotherapy with tapping or a standard physiotherapy group. The outcome will be assessed using the VAS score, considering interval or ratio data; thus, a parametric independent t-test will be employed to determine the significance level.Irrelevant t-test and mean distinction will bedeterminedtotestthetheorybasedon followingpresumptions-

Datawereproportion

TwodistinctivearrangementsofsubjectsintwoconditionsThet- formula-

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\left[\sqrt{\frac{\left(\sum X_1^{\,2} - \frac{(\sum X_1)^2}{n_1}\right) + \left(\sum X_2^{\,2} - \frac{(\sum X_2)^2}{n_2}\right)}{(n_1 - 1) + (n_2 - 1)}} \times \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}\right]}$$

Where

x1=meanofscoresfromtreatmentgroupx2=meanof scores fromcontrolgroup

∑X12=thesquareofeachindividualscorefromtreatmentgrouptotaled

∑X22=thesquareofeachindividualscorefromcontrolgrouptotaled(∑X1)2=thetotalof theindividualscorefromtreatmentgroupsquared

(∑X2)2=thetotaloftheindividualscorefromcontrolgroupsquaredn1=numberof subjectsfromtreatmentgroup n2= number of subjects fromcontrolgroup

SignificantLevel

Soas todiscoverthecentralityofthestudy,thescientistdeterminedthe,,p-value.Thepvalues elude the probability of the outcomes for experimental study. The word probability alludestotheexactnessofthediscoveries.Apvalueiscalledlevelofimportanceforan analysisandapvalueof<0.05willbeacknowledgedashugeoutcomeforwellbeingadministration look into. In the event that the p value is equivalent or littler than the criticallevels,theoutcomeswillsaytobenoteworthy.

Eliminationofconfoundingvariables

A confounding variable influences the study variables, potentially impacting the study's results.This study contained confounding variables, including patient age, recent physiotherapy interventions, oral NSAIDs, steroid injections, and other treatments that could affect the study's results. The researcher identified no significant difference between the mean ages of the two groups; the mean age of the control group was 41 years, while the mean age of the trial group was 43 years, indicating that age did not affect the results. To mitigate confounding variables, the researcher established inclusion criteria that permitted only participants without a recent history of physiotherapy intervention, oral NSAIDs, steroid injections, or other treatments.

Limitationsofthestudy

1. The primary limitation of this study will be its short duration.
2. The trial will involve 70 patients with tennis elbow, a rather small sample size in both groups, which will be insufficient to generalise findings to the broader population of this ailment.
3. It is limited by the daily realities of the subject's workouts, which will have had an impact. The analyst will examine the effects of taping following four sessions.
4. The enduring effects of taping will not be examined in this study.
5. The research will be conducted at CMJ University, a limited setting, making it challenging to maintain confidentiality regarding the study's aspects for the blinding approach. Consequently, blinding will not be employed in this investigation.
6. No accessible study has been conducted in that region of India. Consequently, relevant data regarding the comprehension of tennis elbow, together with specific interventions for India, will be somewhat limited in this study.

Results:-

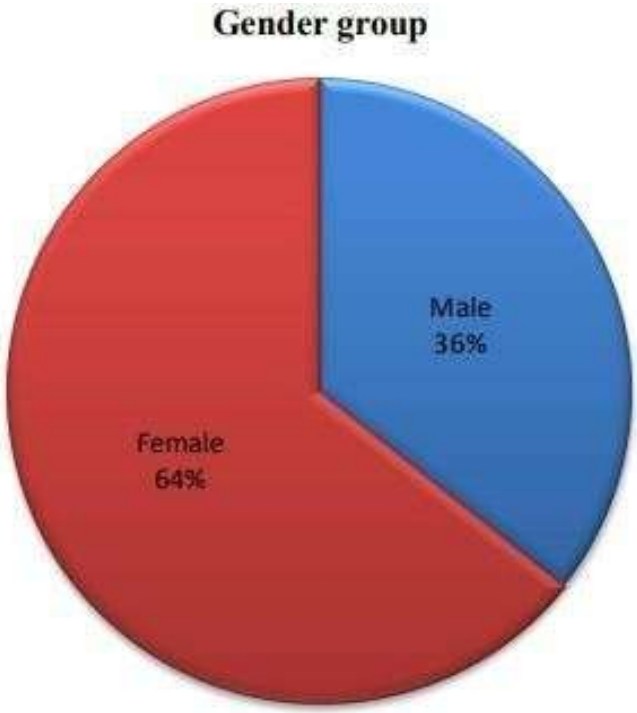
60 individuals diagnosed with tennis elbow participated in the study. 30 participants were assigned to the experimental group receiving conventional physiotherapy treatment, while thirty participants comprised the control group receiving only conventional physiotherapy treatment. All individuals in both the experimental and control groups assessed their pain using a visual analogue scale before and after treatment completion.

Mean age of the participants:

Mean age of the participants of experimental group is 43 andcontrolgroup is41

Sexoftheparticipants:

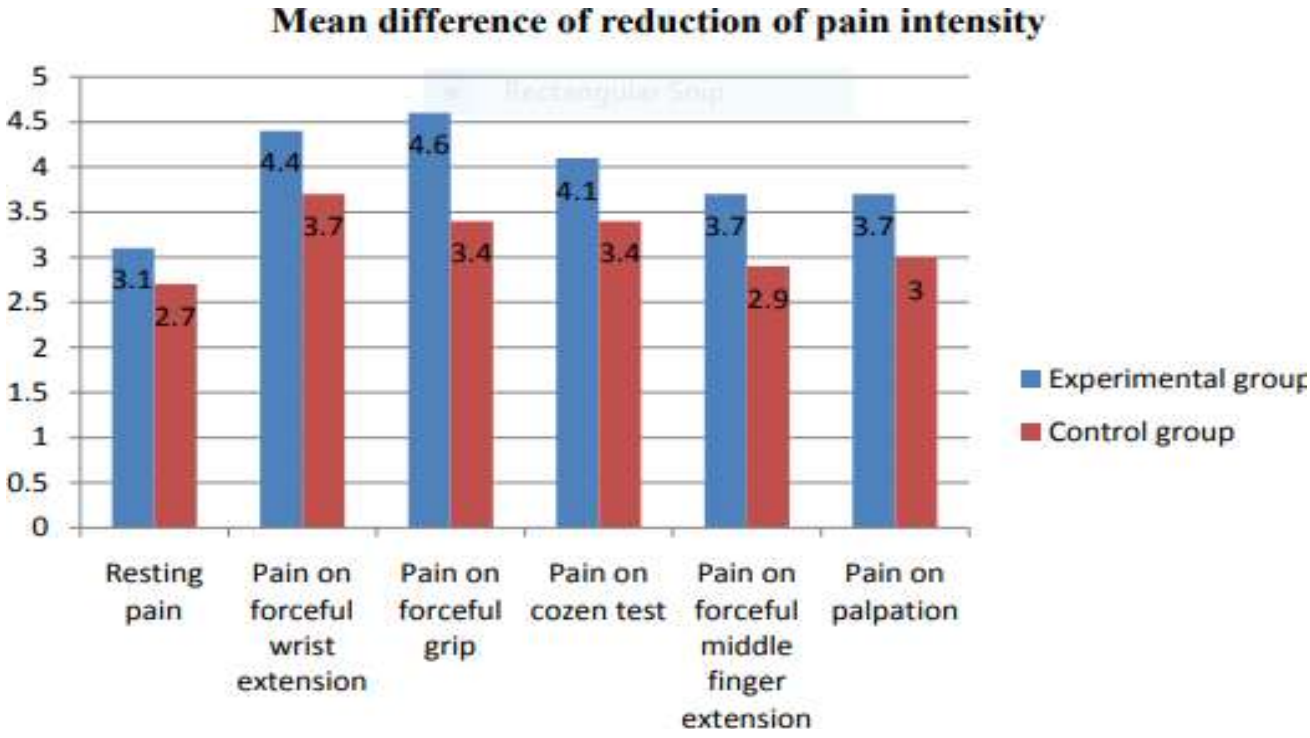
60patientswithtenniselbowwereincludedassampleofthestudy,amongthemalmost36%weremaleandabout64%werefemale.



Restingpain

60 patients were enrolled and 30patients among them were assigned to active intervention. Therest of 30 patients were assigned to the controlled group. Mean difference of reduction of painintensity between experimental and control group was 3.1 and 2.7. Using unrelated „t‟ test onthedataofrestingpain(t=1.319,df=12)theresultwasfoundnottobesignificantforonetailedhypothesis. So this result

suggests that following application of treatment the experimentalgroupshowed nosignificantimprovementincaseofresting pain.



Painonforcefulwristextension

Thet‟ value of reduction of pain intensity for pain on forceful wrist extension is 2.000. Meandifference of reduction of pain intensity for experimental group was found 4.4 and for controlgroup it was found 3.7. Using unrelated „t‟ test on the data of pain on forceful wrist extension(t=2.000,df=12,p<0.05)theresultwasfoundtobesignificantforonetailedhypothesis.The„t‟has an associated probability level of less than 5%, which means that the probability of randomerror is less than 5 in 100. Therefore, this study can say that the result is significant in case ofpainonforcefulwristextension.So,thisresultsuggeststhatthereismoresignificantimprovement in pain on forceful wrist extension when using conventional physiotherapy withtapingthan onlyconventionalphysiotherapyfor patientwithtenniselbow.

Painonforcefulgrip

The„t‟valueofreductionofpainintensityforpainonforcefulgripis1.876.Meandifference of reduction of pain intensity for experimental group was found 4.5 and for control group it was found 3.4. Using unrelated „t‟ test on the data of pain on forceful wrist extension (t=1.876, df=12, p<0.05) the result was found to be significant for one tailed hypothesis.

The „t‟ has an associated probability level of less than 5%, which means that the probability of random error is less than 5 in 100.Therefore, this study can say that the result is significant in case of pain on forceful grip. So, this result suggests that there is more significant improvement in pain on forceful grip when using conventional physiotherapy with taping than only conventionalphysiotherapy.

Pain on forceful middle finger extension:

The „t‟ value of reduction of pain intensity for pain on forceful middle finger extension is2.197. Mean difference of reduction of pain intensity for experimental group was found 3.7 and for control group it was found 2.8. Using unrelated „t‟ test on the data of pain on cozen test(t=2.197, df=12, p<0.025) the result was found to be significant for one tailed hypothesis.The„t‟ has an associated probability level of less than 2.5%, which means that the probability of random error is less than 2.5 in 100. Therefore, this study can say that the result is significant in case

of pain on forceful middle finger extension. So this result suggests that there is more significant movement in pain on forceful middle finger extension when using conventional physiotherapy with taping than only conventional physiotherapy for patient with tennis elbow.

Pain on palpation:
The „t" value of reduction of pain intensity for pain on palpation is 2.485. Mean difference of reduction of pain intensity for experimental group was found 3.7 and for control group it was found 3.0. Using unrelated „t" test on the data of pain on cozen test (t=2.485, df=12, p<0.025) the result was found to be significant for one tailed hypothesis. The „t" has an associated probability level of less than 2.5%, which means that the probability of random error is less thanin 100. Therefore, this study can say that the result is significant in case of pain on palpation.

So, this result suggests that there is more significant improvement in pain on palpation when using conventional physiotherapy with taping than only conventional physiotherapy for patient with tennis elbow.Variables in the study statistically significant or not significant at the following level of significance:

No.	Variables	Calculated 't' value	P value	Significant or not significant
1.	Resting pain	1.319		Not significant
2.	Pain on forceful wrist extension	2.000	<0.05	Significant
3.	Pain on forceful grip	1.876	<0.05	Significant
4.	Pain on cozen test	1.798	<0.05	Significant
5.	Pain on forceful middle finger extension	2.197	<0.025	Significant
6.	Pain on palpation	2.485	<0.025	Significant

Discussion:-

This study aimed to assess the efficacy of taping in conjunction with conventional physiotherapy compared to conventional physiotherapy alone for tennis elbow. This experimental investigation involved 14 patients with tennis elbow, who were randomly allocated to either the experimental group or the control group. Of the 60 patients, 30 were assigned to the experimental group, receiving taping in conjunction with conventional physiotherapy, while the remaining 30 comprised the control group, receiving only conventional physiotherapy. Each group participated in four treatment sessions over a two-week period in the physiotherapy department of CMJ University. The result was assessed using a visual analogue scale to evaluate pain severity in various functional positions. The researcher identified a statistically significant reduction in discomfort during forced wrist extension ($p < 0.05$), forceful grasp ($p < 0.05$), and the Cozen test ($p < 0.05$).

Discomfort with forceful middle finger extension ($p<0.025$), tenderness upon palpation ($p<0.025$), and a minor albeit statistically insignificant reduction in resting pain.

Shamsoddin et al. (2010) conducted a study on the "Initial Effect of Taping Technique on Wrist Extension, Grip Strength, and Pain in Individuals with Lateral Epicondylitis" to assess the initial impact of taping on these parameters in individuals with tennis elbow. Fifteen patients (10 men and 5 women aged 42-53 years) were involved, with grip strength and pain measured on their dominant arm before and immediately after the application of tape as end measures. Hand-held dynamometers and jammar dynamometers were employed to assess wrist extension and grip strength, while a visual analogue scale (VAS) was utilised to measure discomfort. The study concluded that the taping approach significantly influences wrist extension, grip strength, and pain in persons with tennis elbow. Consequently, it is advised for functional rehabilitation. Vicenzino et al. (2003) conducted an experimental study with sixteen volunteers with chronic lateral epicondylalgia, examining a placebo-controlled elbow taping technique. The outcome measurements included pain-free grip strength and pressure pain threshold. The results indicated that the taping technique enhanced pain-free grip strength by 24% from baseline (P = .028). The therapeutic effect exceeded that of the placebo and control conditions. The alterations in pressure pain threshold (19%) were positive but not statistically significant. This early investigation indicated a preliminary beneficial effect of a taping approach for lateral epicondylalgia and suggested its consideration as an adjuvant in managing this ailment.

Amro et al. (2010) conducted an experimental design study to examine the effects of a combination of taping, Mulligan's movement with mobilisation, and traditional treatment versus traditional treatment alone in patients with lateral epicondylitis, with the objectives of alleviating pain, enhancing grip strength, and improving activities of daily living. A total of 34 patients, aged 16 to 69 years, participated in 11 sessions of either a combination of Mulligan techniques and traditional treatment (experimental group, n=17) or traditional treatment alone (control group, n=17). The outcome was assessed using a visual analogue scale, maximum grip strength, and the Patient-Rated Tennis Elbow Evaluation. Analysis indicated that the mean improvement in the visual analogue scale and maximal grip strength was substantially greater in the experimental group compared to the control group. This study shown that the integration of taping and Mulligan's movement with mobilisation techniques, in conjunction with conventional treatment, results in superior outcomes for the management of lateral epicondylitis compared to conventional treatment alone.
Sharath (2005) conducted a study to assess the synergistic impact of wrist manipulation and elbow taping on patients with tennis elbow. Thirty people were randomly allocated to the experimental and control groups. The instruments employed for measurement included a handheld dynamometer, a visual analogue scale, and a 6-point scale of worldwide improvement. The results indicated a mean enhancement in dynamometer readings and a substantial reduction in VAS scores after three weeks; however, no significant improvement was observed during the six-week intervention, with $p<0.01$. The 6-point measure of global improvement demonstrated substantial enhancement with $p<0.001$.

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