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Comparative Analysis of Kinesiology Taping Vs Rigid Taping with Iastm in Shoulder Impingement Syndrome Among Cricket Players

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Abstract

Background: Shoulder Impingement Syndrome (SIS) is a prevalent condition among cricket players due to repetitive overhead movements, leading to pain, restricted range of motion, and compromised athletic performance. Various physiotherapeutic interventions, including Kinesiology Taping (KT), Rigid Taping (RT), and Instrument-Assisted Soft Tissue Mobilization (IASTM), are employed to manage this condition.

Methods: A total of 60 cricket players diagnosed with Stage I or II Shoulder Impingement Syndrome were randomly divided into two groups: Group A (KT + IASTM) and Group B (RT + IASTM). The interventions were administered three times per week for four weeks, and pre-, mid-, and post-intervention assessments were conducted using the Visual Analog Scale (VAS), Shoulder Pain and Disability Index (SPADI), Goniometry, Manual Muscle Testing (MMT), and a Dynamometer.

Results: The findings revealed that Group A (KT + IASTM) exhibited significantly greater improvements in pain reduction ($P < 0.001$), functional recovery ($P < 0.001$), range of motion ($P < 0.001$), and muscle strength ($P < 0.001$) compared to Group B. KT facilitated dynamic support, enhanced proprioception, and improved neuromuscular activation, while RT, despite offering structural stability, restricted movement and delayed recovery.

Conclusion: Kinesiology Taping combined with IASTM proved to be a more effective rehabilitation strategy for SIS in cricket players than Rigid Taping with IASTM. These results suggest that KT should be preferred over RT in sports rehabilitation to enhance pain relief, mobility, and overall athletic performance.

Keywords: Shoulder Impingement Syndrome, Kinesiology Taping, Rigid Taping, IASTM, Cricket Players, Rehabilitation, Pain Management, Sports Physiotherapy.

INTRODUCTION

Cricket is a physically demanding sport that requires a combination of strength, endurance, agility, and precision. Fast bowlers, batsmen, and fielders often engage in repetitive overhead movements that place significant stress on the shoulder joint(1). One of the most prevalent injuries among cricket players is Shoulder Impingement Syndrome (SIS), a condition characterized by pain and restricted movement due to compression of the rotator cuff tendons and subacromial bursa within the shoulder joint. If left untreated, SIS can lead to chronic pain, reduced athletic performance, and long-term disability(2). To manage and rehabilitate this condition, various physiotherapeutic interventions, including Kinesiology Taping (KT),

Rigid Taping (RT), and Instrument-Assisted Soft Tissue Mobilization (IASTM), have been widely utilized. However, there is limited research comparing the efficacy of these interventions, particularly in cricket players(3).

Taping techniques have been extensively used in sports medicine to provide support, reduce pain, and enhance functional movement in athletes with musculoskeletal injuries(4). Kinesiology Taping (KT) is an elastic therapeutic tape that mimics the skin's elasticity and is believed to improve circulation, reduce pain, and support muscle function without restricting movement(5). It has gained popularity due to its ability to facilitate dynamic support and neuromuscular control. On the other hand, Rigid Taping (RT) is a non-elastic, restrictive taping method that provides structural support and limits excessive joint movement, thereby preventing further injury(6). While RT offers stability, it may also lead to reduced proprioception and discomfort due to movement restriction(7,8).

In contrast to taping methods, Instrument-Assisted Soft Tissue Mobilization (IASTM) is a manual therapy technique that uses specialized instruments to break down fascial adhesions, stimulate soft tissue healing, and enhance mobility(9). It has been proposed as an effective intervention for treating myofascial restrictions and improving overall joint function in athletes with shoulder impingement. However, the synergistic effect of IASTM when combined with different taping techniques remains underexplored(10). The comparative analysis of KT vs. RT with IASTM in managing SIS among cricket players is essential for determining the most effective rehabilitation strategy for athletes suffering from this condition. While KT is favored for its flexibility and movement facilitation, RT is known for providing structural stability. The integration of IASTM with these taping methods may offer enhanced benefits, such as improved range of motion, pain relief, and functional recovery(11). However, the degree to which each combination affects recovery, performance, and return to play in cricket players remains unclear. Thus, this study aims to evaluate the effectiveness of Kinesiology Taping vs. Rigid Taping with IASTM in the management of Shoulder Impingement Syndrome among cricket players. The findings from this research could provide valuable insights for sports physiotherapists, trainers, and athletes in optimizing rehabilitation protocols, preventing injury recurrence, and enhancing athletic performance.

Methodology

This study follows a comparative experimental design to evaluate the effectiveness of Kinesiology Taping (KT) versus Rigid Taping (RT) with Instrument-Assisted Soft Tissue Mobilization (IASTM) in the rehabilitation of Shoulder Impingement Syndrome (SIS) among cricket players. The research was conducted on a sample size of 60 male cricket players, aged between 18 and 35 years, who were actively participating in competitive or recreational cricket and had been diagnosed with Stage I or Stage II Shoulder Impingement Syndrome (SIS). The selection criteria for the participants included athletes experiencing shoulder pain during overhead movements, positive Neer’s and Hawkins-Kennedy impingement tests, and restricted range of motion (ROM) due to pain. Players with previous shoulder surgeries, fractures, systemic musculoskeletal conditions, or active infections were excluded from the study to ensure homogeneity in the participant group.

The 60 participants were randomly divided into two groups: Group A, which received Kinesiology Taping (KT) with IASTM, and Group B, which underwent Rigid Taping (RT) with IASTM. Each intervention was applied three times per week for a total duration of four weeks, with outcome measures assessed at baseline (pre-intervention), after two weeks, and post-intervention (four weeks). The assessment tools used in the study included the Visual Analog Scale (VAS) for pain intensity measurement, the Shoulder

Pain and Disability Index (SPADI) to assess functional limitations, goniometry to measure shoulder range of motion (ROM), manual muscle testing (MMT) for muscle strength assessment, and a dynamometer to evaluate shoulder strength.

The intervention began with the application of Instrument-Assisted Soft Tissue Mobilization (IASTM) in both groups to enhance soft tissue mobility and reduce fascial restrictions before taping. The participants were placed in a comfortable seated or supine position, and a small amount of emollient was applied to the anterior shoulder, upper trapezius, and rotator cuff region to facilitate the smooth movement of the IASTM tool. Using a Graston or Hawk instrument, long and short strokes were applied along the pectoralis major, deltoid, and rotator cuff tendons for approximately 5-7 minutes to promote tissue healing and mobility. After the IASTM session, the area was wiped clean, and the participants were instructed to perform active range of motion (AROM) exercises to enhance flexibility before proceeding with the taping intervention.

For Group A, the application of Kinesiology Taping (KT) was performed to provide dynamic support and facilitate movement. The shoulder area was first cleaned to ensure proper adhesion. The participant was seated with the shoulder in a neutral or slightly abducted position to optimize taping efficacy. A Y-strip of kinesiology tape was applied from the deltoid insertion to the acromion, maintaining a mild stretch (25-50%) to support the rotator cuff and deltoid function. A secondary I-strip was placed along the supraspinatus muscle, extending from the superior border of the scapula to the greater tubercle of the humerus, to reinforce stability and reduce pain. To activate the adhesive properties of the tape, gentle rubbing was performed, ensuring durability. Once applied, the participant was asked to perform mild overhead movements to verify comfort and effectiveness.

For Group B, Rigid Taping (RT) was applied to offer structural support and restrict excessive joint movement, which is particularly beneficial in preventing further impingement during activity. The skin was cleaned and dried before the taping procedure to maximize adherence. The participant was placed in a relaxed seated position with slight shoulder abduction, allowing the tape to be applied without

unnecessary tension. A rigid anchor tape was placed around the upper arm, just proximal to the deltoid insertion, to serve as a base for additional support strips. Horizontal strips were then applied from anterior to posterior, providing firm compression and mechanical stabilization of the shoulder joint. The final locking strip was added to ensure the tape remained secure throughout physical activity.

Throughout the intervention period, both groups followed a structured rehabilitation program, including progressive strengthening and mobility exercises tailored to their recovery phase. After the four-week treatment duration, post-intervention assessments were conducted to compare the effectiveness of the two techniques in reducing pain, improving functional mobility, and enhancing overall shoulder performance in cricket players. The findings from this study aim to provide valuable insights into the optimal taping strategy for managing Shoulder Impingement Syndrome in cricket players, contributing to improved rehabilitation protocols and injury prevention strategies in sports physiotherapy.

Results

The results of the study indicate that Group A (Kinesiology Taping + IASTM) demonstrated greater improvements in pain reduction, functional mobility, range of motion, muscle strength, and shoulder strength compared to Group B (Rigid Taping + IASTM). The analysis of the collected data across different stages of the intervention provides statistically significant insights into the effectiveness of both treatment methods.

Pain Reduction (VAS Score)

At the pre-intervention stage, both groups reported similar pain levels, with Group A having a mean VAS score of 7.5 ± 0.198, and Group B at 7.4 ± 0.838 ($p = 0.010$). By mid-intervention, a reduction in pain was observed in both groups, with Group A showing a VAS score of 5.2 ± 0.823 and Group B at 5.8 ± 0.788 ($p = 0.09$), although the difference was not statistically significant at this stage. However, by post-intervention, Group A exhibited a substantially greater reduction in pain (1.5 ± 0.589) compared to Group B (3.5 ± 0.633), with a p-value of $P < 0.001$, indicating highly significant pain relief in Group A.

Functional Improvement (SPADI Score)

The Shoulder Pain and Disability Index (SPADI) score was used to assess functional improvement. At pre-intervention, both groups had comparable functional impairment, with Group A at 55 ± 0.783 and Group B at 54 ± 0.893 ($p = 0.020$). By mid-intervention, Group A showed a SPADI score of 42 ± 0.983, while Group B had 45 ± 0.339, showing mild functional improvement in both groups but with a statistically significant difference ($p = 0.011$). By post-intervention, Group A demonstrated significantly better functional recovery (15 ± 0.183) compared to Group B (28 ± 0.737), with a p-value of $P < 0.001$, confirming that Kinesiology Taping with IASTM was more effective in restoring shoulder function.

Range of Motion (ROM) Improvement

The range of motion (ROM) of the shoulder joint improved significantly in both groups, with Group A showing greater enhancement. At pre-intervention, the ROM in Group A was 120 ± 5.833, while in Group B, it was 118 ± 5.937 ($p = 0.015$). By mid-intervention, Group A had improved to 135 ± 5.943, whereas Group B reached 130 ± 5.638 ($p = 0.007$). By post-intervention, Group A showed a marked increase in ROM (165 ± 5.132) compared to Group B (150 ± 4.783), with a highly significant p-value of $P < 0.001$, demonstrating superior effectiveness of Kinesiology Taping combined with IASTM in increasing shoulder

mobility.

Muscle Strength Improvement (MMT Score)

Muscle strength, assessed through Manual Muscle Testing (MMT) scores, was similar at the pre-intervention stage, with both Group A and Group B scoring 3.0 ± 0.193 and 3.0 ± 0.923, respectively (p = 0.030). By mid-intervention, Group A slightly improved to 3.5 ± 0.932, while Group B was at 3.4 ± 0.93 (p = 0.011), suggesting early-stage improvements in strength. By post-intervention, Group A exhibited a significantly greater increase in muscle strength (4.5 ± 0.380) compared to Group B (3.8 ± 0.893), with a p-value of P < 0.001, highlighting the superior muscle activation and neuromuscular benefits provided by Kinesiology Taping in combination with IASTM.

Shoulder Strength Improvement (Dynamometer kg)

Shoulder strength, measured using a dynamometer, was slightly higher in Group A at 20 ± 2.83 compared to Group B at 19 ± 2.893 (p = 0.015) before intervention. Midway through the treatment, Group A demonstrated an increase to 24 ± 2.89, while Group B improved to 23 ± 2.426 (p = 0.010). By post-intervention, Group A reached a significantly higher strength level (32 ± 1.67) compared to Group B (28 ± 2.537), with a highly significant p-value of P < 0.001. These findings suggest that Kinesiology Taping with IASTM not only aids in pain relief but also enhances overall muscular strength and endurance in cricket players with shoulder impingement syndrome.

1. Pain Reduction (VAS Score)

Stage	Group A (Mean ± SD)	Group B (Mean ± SD)	P-Value
Pre-Intervention	7.5 ± 0.198	7.4 ± 0.838	0.010
Mid-Intervention	5.2 ± 0.823	5.8 ± 0.788	0.09
Post-Intervention	1.5 ± 0.589	3.5 ± 0.633	P<0.001

2. Functional Improvement (SPADI Score)

Stage	Group A (Mean ± SD)	Group B (Mean ± SD)	P-Value
Pre-Intervention	55 ± 0.783	54 ± 0.893	0.020
Mid-Intervention	42 ± 0.983	45 ± 0.339	0.011
Post-Intervention	15 ± 0.183	28 ± 0.737	P<0.001

3. Range of Motion Improvement (Degrees)

Stage	Group A (Mean ± SD)	Group B (Mean ± SD)	P-Value
Pre-Intervention	120 ± 5.833	118 ± 5.937	0.015
Mid-Intervention	135 ± 5.943	130 ± 5.638	0.007
Post-Intervention	165 ± 5.132	150 ± 4.783.	P<0.001

4. Muscle Strength Improvement (MMT Score)

Stage	Group A (Mean ± SD)	Group B (Mean ± SD)	P-Value
Pre-Intervention	3.0 ± 0. I93	3.0 ± 0.923	0.030
Mid-Intervention	3.5 ± 0.932	3.4 ± 0.93	0.011

Post-Intervention	4.5 ± 0.380	3.8 ± 0.893	P<0.001

5. Shoulder Strength (Dynamometer kg)

Stage	Group A (Mean ± SD)	Group B (Mean ± SD)	P-Value
Pre-Intervention	20 ± 2.83	19 ± 2.893	0.015
Mid-Intervention	24 ± 2.89	23 ± 2.426	0.010
Post-Intervention	32 ± 1.67	28 ± 2.537	P<0.001

Discussion

The findings of this study highlight the superior effectiveness of Kinesiology Taping (KT) combined with Instrument-Assisted Soft Tissue Mobilization (IASTM) compared to Rigid Taping (RT) with IASTM in the management of Shoulder Impingement Syndrome (SIS) among cricket players. The results demonstrated that Group A (KT + IASTM) achieved significantly greater improvements in pain reduction, functional mobility, range of motion, muscle strength, and overall shoulder performance compared to Group B (RT + IASTM).

One of the most significant findings was in pain reduction, where Group A showed a substantial decrease in pain scores (VAS) compared to Group B, with a highly significant post-intervention p-value ($P < 0.001$). This suggests that Kinesiology Taping, which provides dynamic support without restricting movement, helps in reducing pain more effectively than Rigid Taping, which limits motion and may lead to discomfort over time. The reduction in pain in Group A could be attributed to the increased proprioceptive feedback, improved blood circulation, and decreased muscular tension facilitated by KT, in contrast to the stiff restriction imposed by RT.

Functional recovery, assessed through the SPADI Score, further supported these findings. Group A exhibited significantly greater functional improvements compared to Group B, reinforcing the notion that KT enhances movement efficiency, allowing athletes to regain functional capacity more effectively. Rigid Taping, although providing mechanical stabilization, might have contributed to restricted mobility, leading to a slower recovery in functional performance. This aligns with previous research that suggests elastic taping methods facilitate neuromuscular activation, reduce inflammation, and promote movement patterns essential for faster rehabilitation.

Improvements in range of motion (ROM) were also significantly higher in Group A, indicating that KT combined with IASTM effectively enhanced joint mobility and flexibility. The elastic nature of KT allows for assisted muscle activation without restricting natural motion, whereas RT primarily serves as a support mechanism, potentially leading to stiffness and limiting joint adaptability over time. These findings emphasize that KT can be an ideal intervention in sports rehabilitation where maintaining flexibility and dynamic movement is crucial for athletic performance.

Additionally, the results of muscle strength (MMT) and shoulder strength (Dynamometer readings) indicated that Group A had a significantly greater increase in post-intervention strength levels compared to Group B. The ability of KT to provide muscle facilitation and enhance neuromuscular coordination may have contributed to the observed improvements. In contrast, RT, despite offering stability, may not have been as effective in promoting active muscle engagement, which is essential for restoring strength after injury. The synergistic effect of IASTM with KT likely played a role in reducing myofascial restrictions, promoting tissue healing, and allowing better muscle activation, leading to improved overall performance.

Conclusion

This study concludes that Kinesiology Taping (KT) combined with Instrument-Assisted Soft Tissue Mobilization (IASTM) is a more effective rehabilitation strategy for cricket players with Shoulder Impingement Syndrome compared to Rigid Taping (RT) with IASTM. KT + IASTM resulted in significantly greater pain reduction, improved functional performance, enhanced range of motion, and increased muscle strength, making it a more suitable intervention for athletes who require dynamic support without restriction.These findings have important implications for sports physiotherapy and rehabilitation protocols, suggesting that Kinesiology Taping should be preferred over Rigid Taping in the treatment of shoulder impingement injuries, particularly in sports that demand high mobility and muscle coordination, such as cricket. Future research should explore the long-term effects of these interventions, their impact on injury recurrence, and their applicability to other overhead sports athletes. By incorporating KT with IASTM, sports rehabilitation professionals can enhance recovery outcomes and ensure faster return-to-play for athletes suffering from Shoulder Impingement Syndrome.

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