# Effect Of Agility Ladder Training And Cone Drills On Agility Among Hockey Players

**Dr P.Bhaskar Reddy**

Lecturer, Rayalaseema College of Physical Education, Proddatur, Andhra Pradesh, India

## ABSTRACT

The purpose of this study was to determine the effect of agility ladder training and cone drills on agility among hockey players. Sixty male hockey players (N=60) aged 17–20 years, who had participated in different tournaments in Kadapa district, were randomly divided into three groups: Experimental Group I (agility ladder training, n=20), Experimental Group II (cone drills, n=20), and a Control Group (n=20). The experimental groups underwent their respective training for 12 weeks, while the control group did not receive any special treatment. Agility was measured through standardized agility tests before and after the training. The pre-test mean scores were 35.85 (ladder group), 34.30 (cone drills group), and 37.65 (control), while the post-test mean scores were 38.55, 36.75, and 37.80 respectively. ANCOVA analysis revealed a significant difference in adjusted post-test means among groups ($F = 49.36$, $p < 0.05$). Post-hoc analysis confirmed that both ladder training (MD = 2.32) and cone drills (MD = 1.87) produced significant improvements in agility compared to the control group. However, the difference between ladder and cone drills groups (MD = 0.45) was not statistically significant. The findings indicate that both ladder and cone drill training are effective methods to enhance agility in hockey players, with ladder training showing a slightly higher, though not significant, improvement.

**Keywords:** Agility Ladder drills Training, Cone Drills, Hockey Players and agility

## INTRODUCTION

Agility the ability to rapidly change body position or direction while maintaining balance and control is a cornerstone physical quality in field and ice hockey. In match play hockey players frequently perform short accelerations, abrupt deceleration and rapid multi-directional changes while dribbling, tackling or avoiding opponents. Because hockey actions combine perceptual decision-making with brief, high-intensity motor actions, improving agility can meaningfully influence match performance, injury risk and return-to-play readiness for university-level athletes.

Training interventions aimed at agility typically include ladder drills, cone-based drills, small-sided games (SSGs), plyometrics and strength training. Agility ladders emphasise rapid foot placement, coordination, rhythm and neuromuscular timing through patterned steps and high step frequency, while cone drills (e.g., T-test, 505, shuttle runs, slalom drills) emphasize sharper change-of-direction (COD) mechanics, deceleration/acceleration and force application through plant and push-off phases. Although both modalities are commonly used by coaches, their biomechanical demands, specificity and transfer to sport-specific agility differ.

Recent sport-science work highlights that agility is multi-faceted: planned COD speed (pre-planned drills) and reactive agility (perceptual/decision components) are related but distinct skills. Ladder work tends to train coordination, step frequency and footwork patterns more than horizontal force production, whereas cone-based COD drills tend to stress braking, re-acceleration and unilateral force production that underpin faster directional changes. Consequently, ladder and cone drills may produce different adaptations in measured agility tests depending on whether tests require reactive decision-making, high horizontal force or simply rapid foot placements.

Empirical training studies (across team sports) show mixed effects: speed-agility-quickness (SAQ) programs often produce improvements in short sprint and some agility measures, but interventions that include strength, eccentric control and COD-specific loading tend to yield larger improvements in COD performance. Moreover, small-sided games and perceptual training can produce large gains in reactive (decision) components of agility by improving decision-making speed rather than movement speed per se. These results underline why a combined or compared protocol (ladder vs cone drills) in hockey players is worth testing rather than assuming identical effects.

For hockey players — who blend developing technical skill and the physical capacities needed for fast CODs — an evidence-based comparison between ladder training and cone (COD) drills is particularly relevant. Ladder drills may be attractive because of low equipment needs and coach familiarity, but if cone drills yield superior improvements in change-of-direction speed or transfer better to on-field hockey tests, training programs should emphasise those drills (or a combined prescription). Additionally, examining both planned and reactive agility outcomes will clarify what element of agility (motor vs perceptual) each intervention affects.

Therefore, this study compares the effect of an agility ladder training program and a cone-based COD drill program on multiple agility outcomes (planned COD tests, reactive agility tests and sport-specific agility measures) in hockey players. We hypothesise that cone/COD drills (which load deceleration/acceleration mechanics and unilateral force application) will produce greater improvements in change-of-direction speed, while ladder training will show larger improvements in footwork coordination and step-frequency tasks; reactive/decision components may respond better to perceptual or SSG-style training than to either isolated ladder or cone drill programs.

## EXPERMENTAL DESIGN

Find out the study Effect of agility ladder drills training and cone drills on agility among hockey players .The study was formulated as a true random group design consisting of a pre-test and post test. The subjects men hockey players who are participated different tournaments in kadapa district (N=60) were randomly assigned to three equal groups of twenty and their age ranged between 17-20 years . The selected subjects were divided into three groups randomly. Experimental Group I was considered agility ladder training group, experimental group II was cone drills group and control group was not involved in any special treatment. Pre test was conducted for experimental Groups I and II and the control group on agility. Experimental groups underwent the respective training for 12 weeks. Immediately after the completion of 12 weeks training, all the subjects were measured of their post test scores on the selected criterion variable. The difference between the initial and final scores was considered the effect of respective treatments. To find out statistical significance of the results obtained, the data were subjected to statistical treatment using ANCOVA. In all cases 0.05 level was fixed to test the significance of the study.

## RESULT ON AGILITY

### COMPULATION OF ANALYSIS OF COVARIANCE RESULTS ON AGILITY

The statistical analysis comparing the initial and final means of agility due to agility ladder drills training and cone drills among hockey players is presented in Table-I.

**Table-I**

| | **Agility ladder drills training** | **Cone drills** | **Control Group** | **Source Of Variance** | **Sum Of Squares** | **Df** | **Mean Squares** | **Obtained F** |
|---|---|---|---|---|---|---|---|---|
| Pre-test Mean | 35.85 | 34.30 | 37.65 | Between | 112.43 | 2 | 56.22 | 1.32 |
| | | | | Within | 2419.30 | 57 | 42.44 | |
| Post-test Mean | 38.55 | 36.75 | 37.80 | Between | 32.70 | 2 | 16.35 | 0.50 |
| | | | | Within | 1867.90 | 57 | 32.77 | |
| Adjusted Post-test Mean | 38.62 | 38.17 | 36.31 | Between | 58.74 | 2 | 29.369 | 49.36* |
| | | | | Within | 33.322 | 56 | 0.595 | |
| Mean Diff | 2.70 | 2.45 | 0.15 | | | | | |

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.

*Significant

As shown in Table I, the obtained pre-test means on agility on agility ladder drills training group was 35.85, cone drills group was 34.30 was and control group was 37.65. The obtained pre-test F-value was 1.32 and the required table F-value was 3.16, which proved that there was no significant difference among initial scores of the subjects.

The obtained post-test means on agility on agility ladder drills training group was 38.55, cone drills group was 36.75 was and control group was 37.80. The obtained post-test F-value was 0.50 and the required table F-value was 3.16, which proved that there was no significant difference among post-test scores of the subjects.

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined and analysis of covariance was done and the obtained F-value 49.36 was greater than the required value of 3.16 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post-hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table-II.

**Table-II**

Multiple Comparisons of Paired Adjusted Means and Scheffe's Confidence Interval Test Results on agility

| **MEANS** | | | | **Required C.I.** |
|---|---|---|---|---|
| **agility ladder drills training Group** | **cone drills Group** | **Control Group** | **Mean Difference** | |
| 38.62 | 38.17 | | 0.45 | 0.61 |
| 38.62 | | 36.31 | 2.32* | 0.61 |
| | 38.17 | 36.31 | 1.87* | 0.61 |

***** Significant

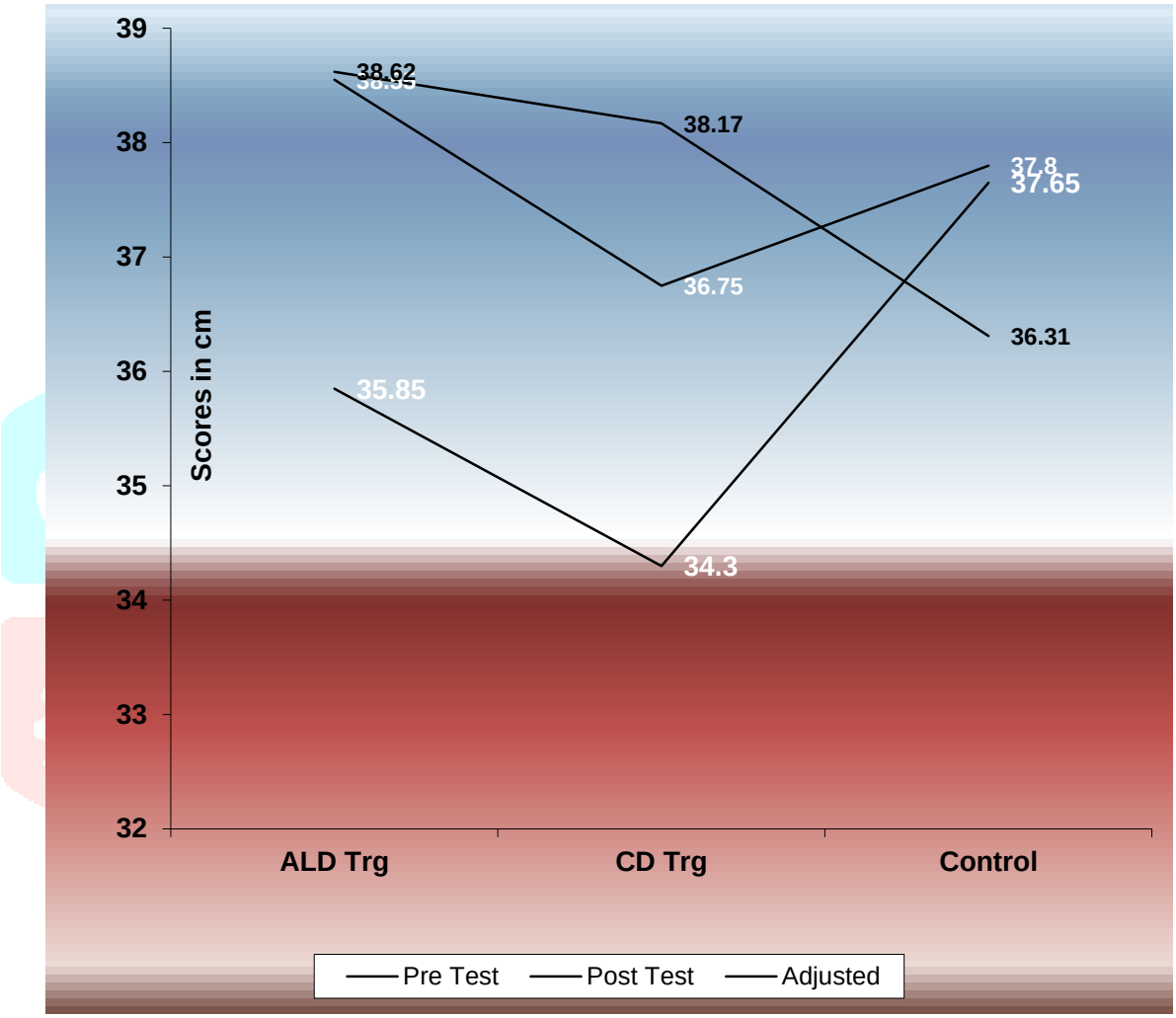
The post-hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between agility ladder drills training group and control group (MD: 2.32). There was significant difference between cone drills group and control group (MD: 1.87). There was no significant

difference between treatment groups, namely,agility ladder drills training group and cone drills group (MD: 0.45).

The ordered adjusted means were presented through Line diagram for better understanding of the results of this study in Figure I.

**Figure I**

**LINE DIAGRAM SHOWING PRE-TEST, POST-TEST AND ORDERED ADJUSTED MEANS ON AGILITY**




**DISCUSSIONS ON FINDINGS ON LEG AGILITY**

In order to find out the effect of agility ladder drills training and cone drills on agility the obtained pre and post-test means were subjected to ANCOVA and post-hoc analysis through Scheffe's confidence interval test.

The effect of agility ladder drills training and cone drills on agility is presented in Table I. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F-value 49.36 was greater than the required table F-value to be significant at 0.05 level.

Since significant F-value was obtained, the results were further subjected to post-hoc analysis and the results presented in Table II proved that there was significant difference between agility ladder drills training group and control group (MD: 2.32) and cone drills group and control group (MD: 1.87). Comparing between the treatment groups, it was found that there agility ladder drills training was better than cone drills group with mean difference of 0.45. However, this difference was not significant between agility ladder drills training and cone drills group among hockey players.

## CONCLUSIONS

The findings of the present study demonstrate that both agility ladder training and cone drill training significantly improved agility among hockey players when compared to a control group. The analysis confirmed that while both experimental methods produced meaningful gains, there was no statistically significant difference between the two training approaches. However, agility ladder drills showed a marginally greater improvement than cone drills. These results suggest that incorporating either ladder or cone-based training into regular practice can effectively enhance agility, which is a critical performance component in hockey. Coaches and physical educators may therefore utilize these methods interchangeably or in combination to maximize the development of agility in young hockey players.

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