



Effect Of Adjunt Sports Specific Drill Training on Selected Fitness Parameters in Amateur Lawn Tennis Players

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ABSTRACT

Lawn tennis, game in which two opposing players or pairs of players use tautly strung rackets to hit a ball of specified size, weight, and bounce over a net on a rectangular court.

Tennis is characterized by the execution of a series of high intensity and explosive actions, sprints, changes of direction and abrupt deceleration; these specific movements put the tennis player under physical stress. 1 this component of training is as such termed as agility. The percentage of lower limb injuries in lawn tennis in players is 73%.

Hence there is a need of designing an optimal conditioning program for improvement of agility and sprint performance which may reduce the risk of injuries and to improve the quality of performance. AIM was to find the effect of sports specific drill training on selected fitness parameters in amateur lawn tennis players. 50 purposive sample, using experimental study for 6 weeks in lawn tennis players. Result The pre and post training results of descriptive statistics and paired T test shows significant improvement in experimental group for agility test ($t = 5.220$ and $p < 0.0001$)

And 10 meter sprint ($t = 5.432$ and $p < 0.0001$) There is Statistically significant difference post training with illionos agility test and ten meter sprint test in experimental group as compared to control group was seen post training session. Conclusion The present study concluded an effect of sports specific drill training has effect on Agility test and sprint test timings.

INTRODUCTION

Lawn tennis, game in which two opposing players or pairs of players use tautly strung rackets to hit a ball of specified size, weight, and bounce over a net on a rectangular court.

Tennis is characterized by the execution of a series of high intensity and explosive actions, sprints, changes of direction and abrupt deceleration; these specific movements put the tennis player under physical stress.²

The dynamicity of tennis subjects the player to rapid and quick change of position, thereby continuously challenging his athletic ability. To sustain this swift positional variation, it is essential to identify the most important component of fitness for the specific sport and tailor the athlete's training towards improving this particular component.¹ this component of training is as such termed as agility.

Agility can be expressed as the ability to change Body's position efficiently, involving the integration of Isolated movement skills in

combination with balance, Coordination, speed, reflexes, strength, endurance And stamina. Agility is a rapid whole body movement With change of velocity or direction in response to a Stimulus.² Agility training is therefore thought to Be a reinforcement of motor programming through neuromuscular conditioning and neural adaptation of muscle spindles, golgi-tendon organs, and joint Proprioceptors.^[3,4] as such on enhancing balance and Control of body positions during movement, agility Theoretically should improve.

Tennis has often been described as a game of incessant emergencies because with every shot the opponent hits, not only can a ball have a different velocity, a different type and rate of spin but can also be placed in varied parts of court.⁵this complexity requires tennis athletes to have fast reaction times and explosive “first step” speed.

Tennis players therefore need to be exceptional lateral and multidirectional movers in addition to linear movers.⁶ Considering that tennis generally include these changes of direction in response to a stimulus (e.g. another player’s movement, movement of play or the ball), it would seem imperative to provide training that mimics these demands to augment specificity.

Training for change of direction, speed and agility must involve highly specific training that recognizes the specific demands of the sport.⁶ this represents an emphasis on the specificity of training with specific movement patterns, as straight sprint training appears to have little or no influence on the improvement of sprinting that involves changes of direction.⁷ Agility training on the contrary improves change of direction assessments.⁸

Sport specific conditioning training can be included into a training programmer as part of an injury prevention/management strategy or with the primary aim of improving athlete performance.

A sport specific conditioning involves a various set of exercise focusing on major

aspects of game and improving the player’s performance overall.

Amateur is someone who does something because they enjoy doing it. They are not doing it in order to be paid. It is not how they earn money to live Tennis being a sport of dynamic demands requires superior agility and speed in order to react to rapidly variable stimulus. Therefore, the present study will be conducted to investigate the efficacy of sport specific drill training on physical fitness parameters and tennis performance.

NEED OF STUDY

The percentage of lower limb injuries in lawn tennis in players is 73%.⁸

Researchers has proven that lack of agility strength and other fitness parameter are intrinsic risk factors of lower limb injuries in elite lawn tennis players.

Hence there is a need of designing an optimal conditioning program for improvement of agility and sprint performance which may reduce the risk of injuries and to improve the quality of performance.

AIM

To find the effect of sports specific drill training on selected fitness parameters in amateur lawn tennis players.

Objectives

1. To study the effect of sport specific drill training on agility performance in amateur tennis players.
2. To study the effect of sports specific drill training on sprint performance in amateur tennis players.

Hypothesis

Null hypothesis – sport specific drill training has no effect on agility performance and sprint performance.

Alternate hypothesis – sport specific drill training has effect on agility performance and sprint performance.

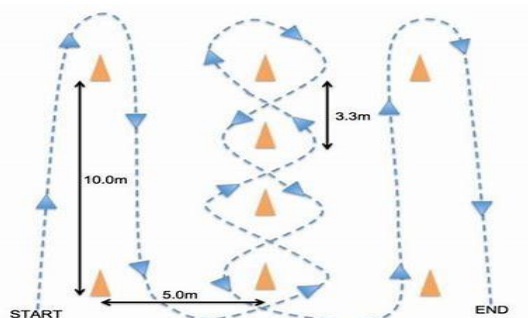
Methodology

Sample size – 50

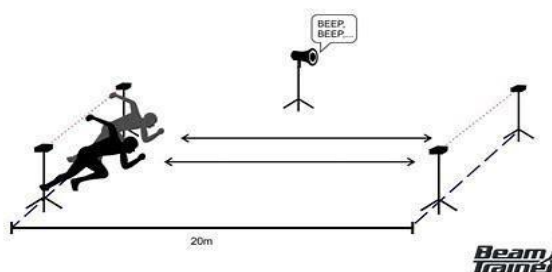
Sample type – purposive sampling

Study design – experimental study**Study duration – 6 weeks****Study population – lawn tennis players****Study set up – PCMC, Pune.****Outcome measures****1. Illionos agility test**

Simple and easy to administer .It was conducted on ground with less material. Procedure had same framework like lawn tennis.

**2. 10 meter sprint**

10 meter sprint test, from a standing start position, for the evaluation of acceleration in a straight line; asked subject to run till the mark and time was measured in seconds. (Girard and Millet, 2009) ^[5]

**Materials****Measuring tape****Markers****Cones****Stopwatch****Record sheets****Ladder drill****Inclusion Criteria****Age – 10-15 years****Both males and females****Amateur lawn tennis players****Exclusion criteria**

Players with recent injuries and re injuries

Players with any systemic illness

Unwilling participants

Procedure

Ethical approval was taken by ethical committee.

The study was explained to players and an informed consent form was taken from each lawn tennis players.

Sample was collected through inclusion criteria.

Samples were distributed into two groups of 25 participants by randomizing method ie. By chit system

The sports specific conditioning/drill training was carried out for about 6 weeks in 18 sessions of training for 30 min/day, 3 days/week for experimental group.

Control group was doing their regular training session including warm up and stretching

Subjects were tested on Illionos agility test and 10 meter sprint test Pre and post assessment scores were measured and noted down.

Data analysis was done.

Sports specific drill training**Training Protocol**

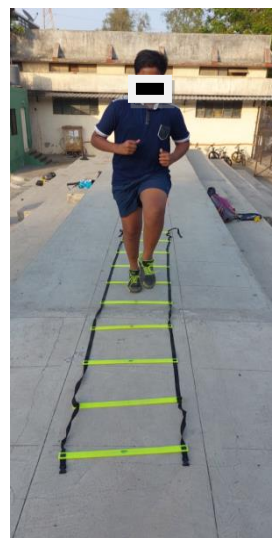
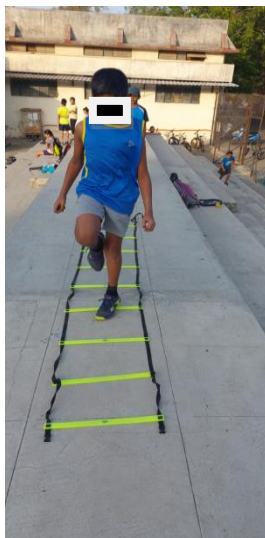
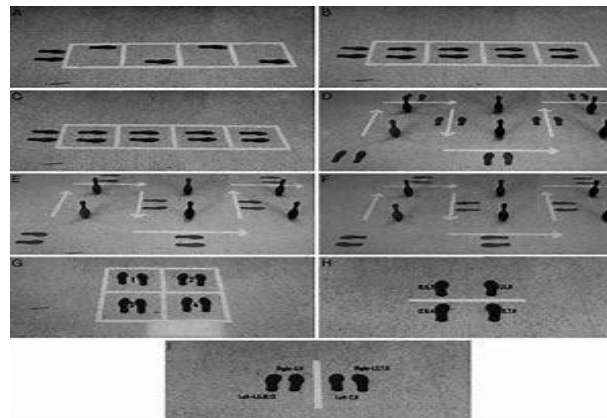
Experimental group Participants in this group was practicing agility training for 6 weeks, 3 days per week along with regular tennis practice. Each session lasted for 30 minutes. The work-to-rest ratio was 1:3 for all participants.³ Before training procedure the participants will acquainted to the exercises, and Will go for a practice session. In addition, prior to training the participants were participating in a warm up session. the agility training protocol involve the following exercises:

“Ladder Agility Drill” ¹⁶ To set up ladder agility drills a ladder measuring 7.7 m in length, 0.4 m in width and 0.4 m between rungs was used. the protocol involved the following drills

1. “Alternate foot ladder sprint”
2. “Lateral shuffle”
3. “In-In/Out-Out” drill
4. “1 Foot-Out/2 Foot-In” drill
5. “Forward backward sprint

PROTOCOL OF AGILITY DRILL

DRILL	NO OF SETS	TIME IN SECS
Ladder Agility Drill	2	30
Alternate foot ladder drill	2	30
Lateral shuffle	2	30
In-in / out out drill	2	30
1 foot out/ 2 foot in drill	2	30
Forward backward sprint	2	30

**Result**

The pre and post training results of descriptive statistics and paired T test shows significant improvement in experimental group for agility test ($t = 5.220$ and $p < 0.0001$) And 10 meter sprint ($t = 5.432$ and $p < 0.0001$)

There is Statistically significant difference post training with illionos agility test and ten meter sprint test in experimental group as compared to control group was seen post training session.

The test used in this study was paired and unpaired t test.

GROUP A - Experimental group

GROUP B - Control group

OUTCOME MEASURE / GROUP	PRE MEAN \pm SD TIME IN SEC	POST MEAN \pm SD	T-VALUE	P- VALUE	RESULT
ILLIONOS A	16.28 \pm 3.264	15.47 \pm 3.263	10.083	<0.0001	HIGHLY SIGNIFICANT
ILLIONOS B	19.19 \pm 2.827	19.24 \pm 2.76	-0.613	0.545	NOT SIGNIFICANT

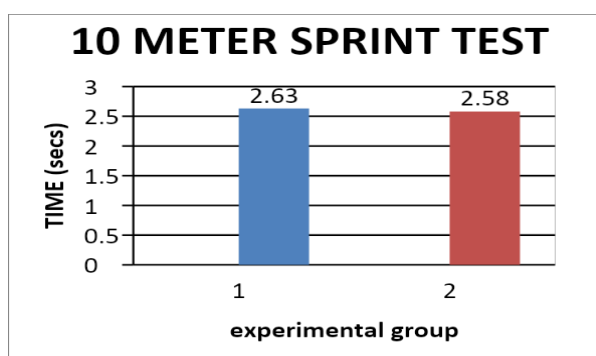
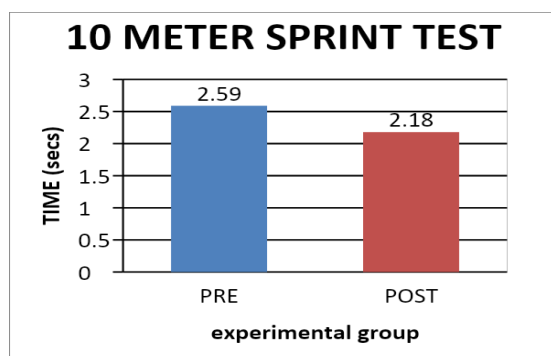
1. ILLIONOS AGILITY TEST PRE AND POST TEST VALUES OF TIME IN SECS

In GROUP A, P value is <0.0001 making it statistically highly significant.

OUTCOME MEASURE / GROUP	PRE MEAN \pm SD	POST MEAN \pm SD	T-VALUE	P-VALUE	RESULT
10 METER SPRINT group A	2.59 \pm 0.6054	2.184 \pm 0.5909	8.974	<0.0001	HIGHLY SIGNIFICANT
10 METER SPRINT group B	2.59 \pm 0.6054	2.588 \pm 0.464	1.418	0.169	NOT SIGNIFICANT

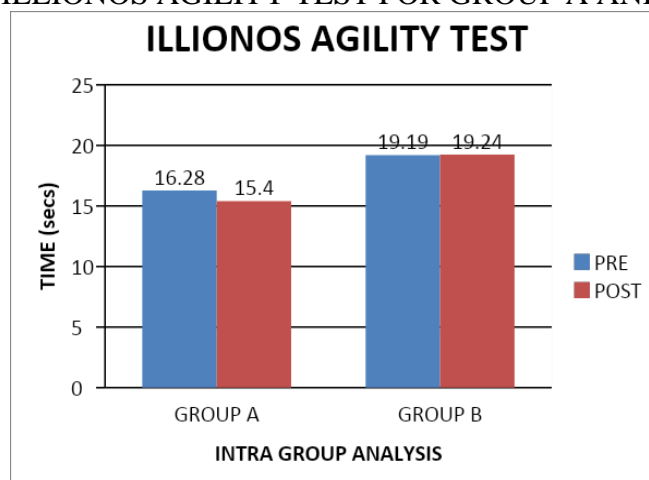
2. 10 METER SPRINT TEST pre and post values of time in secs

In GROUP A, P value is <0.0001 making it statistically highly significant



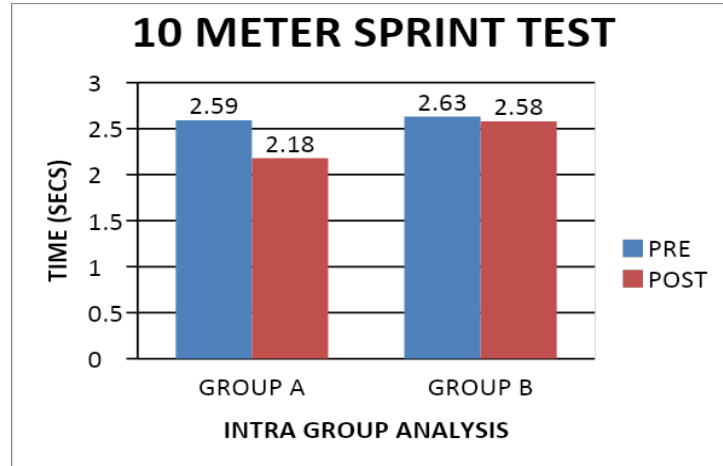
OUTCOME MEASURE	GROUP A MEAN \pm SD	GROUP B MEAN \pm SD	T VALUE	P VALUE	RESULT
ILLIONOS AGILITY	0.808 \pm 0.4007	0.28 \pm 0.3089	5.220	<0.0001	HIGHLY SIGNIFICANT

3. Difference in time of ILLIONOS AGILITY TEST FOR GROUP A AND B post agility training



OUTCOME MEASURE	GROUP A MEAN \pm SD	GROUP B MEAN \pm SD	T VALUE	P VALUE	RESULT
10 METER SPRINT TEST	0.406 \pm 0.2262	0.134 \pm 0.1065	5.432	<0.0001	HIGHLY SIGNIFICANT

4. Difference in time in sec of 10 METER SPRINT TEST FOR GROUP A AND B post agility drill training



DISCUSSION

Agility forms one of the essential components of successful sports performance. There are various training benefits essential for excellence in performance that agility training can provide such as challenging the core, strengthening the legs, creating better balance, increasing reactive capabilities, and best of all increasing cardiovascular efficiency. The role of agility training therefore seems to be imperative for performance to be at advanced level. The results of the present study showed an improvement in agility post training in experimental group, which was transferred to performance as evident by improved Timing of agility test. The results are consistent with the work of Leone et al¹⁹ who suggested that speed and agility are very specific and must be assessed and developed in different tennis related conditions, and that assessment and training must be sport specific for maximal efficiency.¹⁹ With agility training, improvement in performance can be either due to better motor recruitment or neural adaptations. Neural adaptations usually occur when athletes respond or react as a result of improved coordination between the CNS signal and proprioceptive feedback.²⁰

While executing a tennis serve, players assume a typical “low ready position”. Though being the most efficient starting

position for explosive movement, because of the lowered centre of mass, it does require the athlete to have the hamstring in a shortened contracted position for long periods.⁶ Furthermore the forces generated during the serve are transferred to the upper limbs via sequential summation of forces beginning with the “ground reaction force” which consequently translates upwards.²¹ As such lower limb strength along with core strength are essential adjuncts for service precision, which can be enhanced with agility training. Additionally for good performance, player’s body should be properly aligned and balanced.

This ability allows the player to position, recover and provide a good base of support for force execution. Agility therefore can improve proprioceptive ability, which in turn can improve pre- and post- serve alignment and balance.

Agility training challenges the player’s neuromuscular efficiency to maintain his/her center of gravity over changing base of support with constantly changing direction at varying speeds. Thus, training to improve movement not only increases functional capabilities, but also helps in advanced integration of the neural and muscular system while moving at different speeds and in

different planes of motion. Speed, quickness and agility training decrease fatigue time in sprints, agility drills, and increased vertical and horizontal jump distances.²²

Training for agility also improve the proprioceptive ability of the joint which influence neuromuscular firing pattern leading to reduced risk of injury and thereby augmenting performance. Numerous studies support the findings that incorporating various agility drills can reduce the incidence of injury to the lower extremity and simultaneously improve performance.^[23,24,25] Agility training is one example of a neuromuscular control training program that has been recommended for improving hamstrings muscle activation and enhancing dynamic knee joint stability by allowing a more rapid muscle response to anterior tibial translation during joint perturbations.¹⁶

With dynamicity of tennis being trainable, the present study showed effect of agility drill training on agility and sprint performance. Thus, an appropriate sport specific agility training protocol cannot only break the monotony of training but can also improve reactive and explosive response ability of the player.

Conclusion

The present study concluded an effect of sports specific drill training has effect on Agility test and sprint test timings.

With tennis requiring quick positional variations, an agility training program is imperative for excellence in performance.

Strength of the Study

Protocol is highly effective and efficient to improve the agility and sprint performance of the players

Follow up of 6 week protocol 3 times per week was done successfully.

No participant got eliminated during the study period from both the experimental and control groups

Limitation of study

Sample size

Recommendation and scope of the study

This study can be conducted on a larger population along with same outcome measure Other components such as flexibility reaction time endurance can also be assessed with the help of different parameters

Clinical implications

This protocol shows highly significant results in lawn tennis players

This needs to involve in regular practice of lawn tennis players to reduce chances of injuries and to improve the quality of performance.

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