



## A STUDY ON EFFECT OF HORMONES SECRETION & NUTRITION LEVEL ON BODY BUILDERS AND FOOTBALLERS

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### ABSTRACT

*The purpose of the study to show an effects of hormones secretion & nutrition level on body builders and football players. In this study, fifty players were selected form universities of Rajasthan state. Players age between 19 to 26 years. Players were divided into three groups. First group for interval training, second group for complex training and third one is for combination of interval & complex training. the pre-test been done one each football players and this test is been conducted to know some parameters like speed, endurance and performance. 12-week duration is selected for this study. Post-test is the final score. For the statistical analysis of pre and post-test, ANCOVA is used. It is used to find out the mean difference, 'F' ratio and scheff's post hoc test. 0.05 level is fixed. Pilot study helps initiate the capacity of the players to fix the load.*

**KEYWORDS-** hormone secretion, nutrition level, speed, endurance and performance

### INTRODUCTION

In 21<sup>st</sup> century everyone needs to be fit and fine. Yoga, body building and meditation are some examples of healthy tips to make human body fit and perfect.<sup>1,2</sup> Body building is a progressive resistance exercise. It can help to control and develop musculature. A person which are engaged in this is known as body builder. Body builder performed different types of poses in body building competitions<sup>3,4,5</sup>. Judges in this competition may judge their posing, muscularity, sizes and stage of presentation. Throughout competitions body builders eliminated the nonessential body fat, enhanced the combination of extracellular dehydration and carbohydrate loading for maximum muscle vascularity. For competitions body builder may tan and shave their skin.<sup>6,7,8</sup> There are some body-builders who use artificial anabolic steroids and use of other drugs to build and recover the muscles injuries. This drug may cause health risks that's why some competitions these drugs are banned. The winner of Mr. Olympia is the top male professional body-builder<sup>9,10,11</sup>.

Now a day, body builders uses AAS (anabolic-androgenic steroids) it helps to increases the body muscular hypertrophy but it has various health risk. Excess of AAS may lead death also. Before and after training body builders takes supplementing with protein, branched chain amino

acids, creatine<sup>12,13,14</sup>. Before 8-12 weeks of competitions, body builder may focus on reducing the body fat to very low levels for retaining muscle mass. For this body builder uses AAS and combinations of drugs to ensure minimal muscle mass loss. At this time if body builders are engaged in aerobic exercises it may lose their body mass. Aerobic exercises may resist muscular hypertrophy, which may elevate circulating cortisol with endurance exercises and also promote catabolic environment. If aerobic exercise is done in large volumes it may leads to counterproductive<sup>15,16,17,18</sup>.

Body building is an art and culture. Peoples takes it more than sport. Three phase of body building- muscle gain phase, dieting phase and competition. In dietary phase, body builders are focus on increasing muscles mass while minimizing excess increase in fat mass. Selection of food in body building is most important things<sup>19,20,21</sup>. Body builders may have very rigid attitudes towards food selections, their meal frequency and nutrition timing with supplementation. In earlier time magazines and successful competitors may inform about the nutrition and supplementations. In recent time, internet and forums gives the information. Most of the body builder may spend their time on off-seasons



and may require clear and safe nutrition and dietary  
**FOODS FOR BODY BUILDING**

Foods are the main fuel to the body. it gives body strength, improvements, growth etc. some foods which are used for body building are<sup>24,25</sup>

**1. oysters-** these foods have played a big role in hormones productions; it also contains zinc. Some study shows that if any body builder takes zinc supplements this will exhaust the higher post workout testosterone then placebo. There are some other foods which are high in zinc like chicken liver and pumpkin seeds.

**2. Greek yogurt-** yogurts contains higher concentrations of proteins. It is produced by staining excess amount of liquid and carbohydrates from regular yogurt. These may result in higher concentration of casein, a slow digesting proteins and releases slowly amino acids to the blood stream. Before sleeping if body builders consumed casein it provides an increase amino acid in blood. It was sustained throughout the night and increases in synthesis of protein. Greek yogurt may useful for muscle-building.<sup>26,27</sup>

**3. steak-** many body builders can take benefits from saturated fats. Some study shows that high fat/ low fiber and low fat /high fiber can yield more amount of testosterone level. If nay body builder train with a heavy weight he or she may require higher amount of fats and fibers.

**4. Oatmeal** – oat meals contain high amount of fibers. Fibers contained water. It can help to dilute harmful chemical by binding with them and dilute that. It can hasten the unwanted food residues in digestive track. One serving of oatmeal contain 13 percent of fibers. It digests very slowly. It should not eat before exercise. It is the best food for the body. whole grain, fruits, vegetables, seeds, beans and legumes are included.<sup>28,29</sup>

**5. Grapefruit-** resveratrol are presents in grapes. It helps to protect form bacteria and fungi. It has aromatase inhibitors. This converts testosterone and androgens into estrogens. It is also used for lean mass and promotes testosterone level. it contains vitamin C. its helps in me metabolic system and it also has fat burning capabilities. Chemicals which are present in grapes may helps to reduces the level of insulin, fat metabolism and body processes energy more efficiently<sup>30,31</sup>.

**6. beetroots-** beetroot juices may increase the production of nitric oxide gases in the body. it helps blood vessels to dilate and blood flow increases. It helps to improve the oxygen and nutrient delivery to muscles and other tissues. it improves the athletic performance and recovery. It helps to reduce the level of exertion and decreases the amount of oxygen to complete a workout.

**7. Butter-** butter contains high level of nutrients. It was depend on cow breads like grass-fed beef

supplements.<sup>22,23</sup>

contains more amount of omega-3s than normal cows bread. It also contains a higher amount of stearic acid and it doesn't raise the blood cholesterol levels.

**8. Bananas-** enzyme bromelain, was present in bananas. It can boost a man's libido. It also contains B vitamins such as riboflavin. Bromelain is also found in pineapples. It helps to treat indigestion and reduce inflammation<sup>32,33</sup>.

## HORMONES

Chemical messengers of the body are known as hormones. These are travelling through bloodstream and help the tissues and organs to do their proper works.<sup>1,2</sup> Body releases several types of hormones it acts on different aspects of bodily functions.<sup>1</sup> In human body, hormones are released from several glands. It may be required for growth, development, reproduction etc.<sup>34,35</sup> These hormones coordinate the activity of human body and living organism for their growth and development. Endocrine glands help them to release from special tissues in human body.<sup>36,37</sup> Hormone can produce many effects on human body. Different types of hormones produce different types of actions. Some hormones are do their jobs very quickly and stopped but some hormones are for long period of time and had their effects for long periods.<sup>38,39,40</sup>

## METHODOLOGY

Research Methodology of any research is most important things. Here in this study, some methodology are selection of subjects, selection of variables, experimental design, pilot study, criterion measures and selection of tests, reliability of data, reliability of instruments, subject reliability, orientation of the subjects, administration of test items, administration of training programs, collection of data, statistical techniques and its justification adopted for the analysis of data have been done.

## SELECTION OF SUBJECTS

Study has done to find out the isolation and combined effect of football players training on selected endurance, speed and performance parameters. For this study, fifty men and female players were selected form universities of Rajasthan state. Players age between 19 to 26 years. Players were divided into three groups. First group for interval training, second group for complex training and third one is for combination of interval & complex training. Everything will be explained in neat and clean procedure so that player should understand that thing and might give their best.

## SELECTION OF VARIABLES

By searching whole literatures from books, websites or any other sources to find the importance of interval and complex training. Dependent and independent variables are used this study:



## 1. DEPENDENT VARIABLES

### ➤ Endurance Parameters

1. Speed Endurance
2. Muscular Endurance
3. Cardio Respiratory Endurance

### ➤ Speed Parameters

1. Speed
2. Stride Length
3. Stride Frequency

### ➤ Performance Parameters

1. Kicking
2. Dribbling

## 2. INDEPENDENT VARIABLES

Group I – Interval Training

Group II – Complex Training

Group III – Combined Interval and Complex Training

## EXPERIMENTAL DESIGN

Pre and post-test were done the selected groups. Fifty players were selected from the OPJS university, Rajasthan, India. Age of selected players ed in this study.

in between 19 to 26 years. Players were grouped into three. Each and every player should be divided into their respected groups. Group 1 players are for interval training, Group 2 player is for complex training and Group 3 players are for both interval and complex training. At first, the pre-test been done one each football players and this test is been conducted to know some parameters like speed, endurance and performance. 12-week duration is selected for this study. Post-test is the final score. For the statistical analysis of pre and post-test, ANCOVA is used. It is used to find out the mean difference, 'F' ratio and scheff's post hoc test. 0.05 level is fixed significance to hypotheses. Pilot study helps initiate the capacity of the players to fix the load.

## SELECTION OF TESTS

Isolation and combined effects of interval and complex training parameters were measures in this present study. Players speed, endurance and performances before and after the training were check

S. No	Variables	Tests
1	Speed Endurance	100 Metres Run
2	Muscular Endurance	Push ups, Sit Ups
3	Cardio Respiratory Endurance	15 Min Run/Walk
4	Speed	60 Metres
5	Stride Length	Metres
6	Stride Frequency	Numbers
7	Kicking	Soccer Test
8	Dribbling	Soccer Test

## 1. ENDURANCE PARAMETERS

### Speed Endurance (100 meters run)

**Aim:** - To calculate the speed endurance of players.

### Equipment's used:

Measuring tape, clapper and Stopwatch.

### Procedure:

For maximum efforts, player may stand and crouch for 100meters run. Test score may be calculated by the time for clap to crosses the finish line. The fractions were rounded to the next largest one tenth of a second. Digital

electronic watch is used. average velocity is calculated by using the following formula:

$$\text{Speed endurance} = \frac{\text{Distance}}{\text{time}} / \text{mts/seconds}$$



## Results and discussion

ANCOVA analysis of mean of interval, complex and combined training on speed endurance

	Interval training	Complex training	Combined interval and complex training	Df	F ratio
Pre-test means	19.25	19.89	19.27	2	0.16
Post-test means	19.33	19.87	19.89	2	20.46
Adjusted post-test means	18.83	18.89	18.50	2	19.70

The table shows the Pre-test means of interval training, complex training and combined interval and complex training were 19.25, 19.89 and 19.27. The obtained F-ratio for the pre-test was 0.16. the pre-test mean F-ratio was insignificant at 0.05 level of confidence.

It prove that there were no significant differences between the experimental groups. It indicates that the groups process was perfect while assigning the subjects to groups.

Post-test means of the interval training, complex training and combined interval and complex training were 19.33, 19.87 and 19.89. F-ratio for the post-test was 20.46. post-test mean F-ratio was significant at 0.05 level of confidence. it proves that the post-test means of the players were significant.

Adjusted post-test means of the interval training, complex training and combined interval and complex training were 18.83, 18.89 and 18.50. F-ratio for the adjusted post-test means was 19.70. F-ratio was significant at 0.05 level of confidence. It proves that a significant difference among the means due to the experimental trainings on speed endurance. significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test.

From the table, the means of speed endurance among combined interval and complex training group was 19.27, interval training group with mean value of 19.25, and complex training group with mean value of 19.89. ANCOVA is used to analysis of pre and

post test scores and adjusted mean scores of the players. F values were 0.16, 20.46 and 19.70. F value on pre-test scores are not significant and F values on post-test and adjusted means were significant at 0.05 level of confidence. these are greater than table value. Scheff's post hoc test proves that twelve weeks training combined and complex groups are improved speed endurance of football players.

### Muscular Endurance (push up and Sit-ups)

**Aim:** Measure the muscular endurance of the players.

**Equipment's used:** Mats, stop watch and whistle.

### Procedure:

Participants player were lie on the back with knees band. With the heels the feet is on the floor. The angle must be around 90 degrees. Fingers were place behind the neck with elbow touching the mat. Players are then curled up to a sitting position and touches the knees. These were done by many times. Push ups may be done by raising and lower the body portions using arms. One point was scored for each correct push ups and sit-up. Winner whose score was the maximum push ups and sit-ups completed in one minute.

### Results and discussion-

ANCOVA analysis of mean of interval, complex and combined interval and complex training on muscle endurance

	Interval training	Complex training	Combined interval and complex training	Df	F ratio
Pre-test means	34.15	35.70	34.95	2	0.80
Post-test means	40.66	39.65	42.97	2	12.99
Adjusted post-test means	40.16	39.79	42.98	2	12.50

The table shows the Pre-test means of interval training, complex training and combined interval and

complex training were 34.15, 35.70 and 34.95. The obtained F-ratio for the pre-test was 0.80. the pre-test



mean F-ratio was insignificant at 0.05 level of confidence. It prove that there were no significant differences between the experimental groups. It indicates that the groups process was perfect while assigning the subjects to groups.

Post-test means of the interval training, complex training and combined interval and complex training were 40.66, 39.65, 42.97. F-ratio for the post-test was 12.99. post-test mean F-ratio was significant at 0.05 level of confidence. it proves that the post-test means of the players were significant.

Adjusted post-test means of the interval training, complex training and combined interval and complex training were 40.16, 39.79 and 42.98. F-ratio for the adjusted post-test means was 12.99. F-ratio was significant at 0.05 level of confidence. It proves that a significant difference among the means due to the experimental trainings on speed endurance. significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. On muscular endurance, due to experimental training a significant difference on means.

From the table, the means of muscular endurance among combined interval and complex training group was 42.98, interval training group with mean value of 34.95, and complex training group with mean value of 42.97. ANCOVA is used to analysis of pre and post test scores and adjusted mean scores of the players. F values were 0.80, 12.99 and 12.50. F value on pre-test scores are not significant

and F values on post-test and adjusted means were significant at 0.05 level of confidence. these are greater than table value. Scheff's post hoc test proves that twelve weeks training combined and complex groups are improved muscular endurance of football players.

### Cardio-Respiratory Endurance (15 Minutes Run/Walk)

**Aim:** to assess the cardio-respiratory endurance of the players.

#### Equipment's used:

100-meter track, stop watch, whistle, score sheets and pencils

#### Procedure:

This test were administrated with the help of qualified testers. In this 100-meter track were taken and after every ten meters. These are the lap scorers. Players were instructed by instructor to cover as much distance as possible by running and walking until the final whistle. Left minutes are announced to the player after completion of every minutes. A long whistle is been blown after twelve minutes players are stopped instantly and stood on the spot. Lap scorer go to spot and take the reading in tenth meter. The distance covered by the players was used as a measure of cardio-respiratory endurance.

#### Result and discussion-

ANCOVA analysis of mean of interval, complex and combined interval and complex training on cardio-respiratory endurance

	Interval training	Complex training	Combined interval and complex training	Df	F ratio
Pre-test means	2256.40	2156.40	2166.40	2	1.34
Post-test means	2756.10	2656.10	2676.10	2	13.56
Adjusted post-test means	28.20	29.20	29.50	2	13.89

The table shows the Pre-test means of interval training, complex training and combined interval and complex training were 2256.40, 2156.40 and 2166.40. The obtained F-ratio for the pre-test was 1.34. the pre-test mean F-ratio was insignificant at 0.05 level of confidence. It prove that there were no significant differences between the experimental groups. It indicates that the groups process was perfect while assigning the subjects to groups.

Post-test means of the interval training, complex training and combined interval and complex training were 2756.10, 2656.10 and 2676.10. F-ratio for the post-test was 13.56. post-test mean F-ratio was significant at 0.05 level of confidence. it proves

that the post-test means of the players were significant.

Adjusted post-test means of the interval training, complex training and combined interval and complex training were 28.20, 29.20 and 29.50. F-ratio for the adjusted post-test means was 13.89. F-ratio was significant at 0.05 level of confidence. It proves that a significant difference among the means due to the experimental trainings on speed endurance. significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. On cardio respiratory endurance, due to experimental training a significant difference on means.



From the table, the means of cardio-respiratory endurance among combined interval and complex training group was 2166.40, interval training group with mean value of 2256.40, and complex training group with mean value of 2156.40. ANCOVA is used to analysis of pre and post test scores and adjusted mean scores of the players. F values were 1.34, 13.56 and 13.89. F value on pre-test scores are not significant and F values on post-test and adjusted means were significant at 0.05 level of confidence. these are greater than table value. Scheff's post hoc test proves that twelve weeks training combined and complex groups are improved cardio respiratory endurance of football players.

## 2. SPEED PARAMETERS

### Speed (60 Metres Run)

**Aim:** Measure the speed of the player.

	Interval training	Complex training	Combined interval and complex training	Df	F ratio
Pre-test means	8.21	8.01	9.01	2	0.09
Post-test means	7.50	6.50	6.55	2	3.87
Adjusted post-test means	7.39	7.50	7.70	2	3.94

Table shows the Pre-test means of interval training, complex training and combined interval and complex training were 8.21,8.01 and 9.01. The obtained F-ratio for the pre-test was 0.09. the pre-test mean F-ratio was insignificant at 0.05 level of confidence.

It prove that there were no significant differences between the experimental groups. It indicates that the groups process was perfect while assigning the subjects to groups.

Post-test means of the interval training, complex training and combined interval and complex training were 7.50,6.50 and 6.55. F-ratio for the post-test was 3.87. post-test mean F-ratio was significant at 0.05 level of confidence. it proves that the post-test means of the players were significant.

Adjusted post-test means of the interval training, complex training and combined interval and complex training were 7.39, 7.50 and 7.70. F-ratio for the adjusted post-test means was 3.94. F-ratio was significant at 0.05 level of confidence. It proves that a significant difference among the means due to the experimental trainings on speed endurance. significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. On speed, due to experimental training a significant difference on means.

From the table, the means of speed among combined interval and complex training group was 9.01, interval training group with mean value of 8.21,

**Equipment's used:** Track for running, a finish line, stopwatch and a clapper.

### Procedure:

Players were stand at starting position. For better results, two players were run in same direction with same time. The time of clap to crossing the finishing line was taken as test score. The fractions were rounded to the next largest one tenth of a second. stopwatches were used. Two trials were recorded sufficient rest in between. The time taken between the starters and crossed the finishing line was measured as the score in 1/10th of the second.

### Results And Discussion-

ANCOVA of co variance of mean on interval, complex and combined interval and complex training on speed

and complex training group with mean value of 8.01. ANCOVA is used to analysis of pre and post test scores and adjusted mean scores of the players. F values were 0.09, 3.87 and 3.94. F value on pre-test scores are not significant and F values on post-test and adjusted means were significant at 0.05 level of confidence. these are greater than table value. Scheff's post hoc test proves that twelve weeks training combined and complex groups are improved speed of football players.

### Stride Length (60 Metres Run)

**Purpose:** The purpose of this test was to measure the stride length of the subjects.

**Equipment:** track for running, measuring tape, saw dust and clapper.

### Procedure:

Players were allowed to run fast about 60 metres to measure speed, length of stride, which consists of acceleration zone of 30 metres and the test zone of 30 metres. Players uses the acceleration zone to gain maximum speed through the 30 metres test course. sawdust was spread over the test zone. the bilateral discrepancies two successive strides are measured to the nearest centimetre. The results were recorded into centimetres

### Results and discussion-

ANCOVA of co variance of mean on interval, complex and combined interval and complex training on speed



	Interval training	Complex training	Combined interval and complex training	Df	F ratio
Pre-test means	1.65	1.88	1.68	2	1.10
Post-test means	1.60	1.78	1.88	2	19.70
Adjusted post-test means	1.68	1.69	1.71	2	18.20

The table shows the Pre-test means of interval training, complex training and combined interval and complex training were 1.65, 1.88 and 1.68. The obtained F-ratio for the pre-test was 1.10. The pre-test mean F-ratio was insignificant at 0.05 level of confidence. It proves that there were no significant differences between the experimental groups. It indicates that the groups process was perfect while assigning the subjects to groups.

Post-test means of the interval training, complex training and combined interval and complex training were 1.60, 1.78 and 1.88. F-ratio for the post-test was 19.70. post-test mean F-ratio was significant at 0.05 level of confidence. It proves that the post-test means of the players were significant.

Adjusted post-test means of the interval training, complex training and combined interval and complex training were 1.68, 1.69 and 1.71. F-ratio for the adjusted post-test means was 18.20. F-ratio was significant at 0.05 level of confidence. It proves that a significant difference among the means due to the experimental trainings on speed endurance. significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. On stride length, due to experimental training a significant difference on means.

From the table, the means of stride length among combined interval and complex training group was 1.68, interval training group with mean value of

	Interval training	Complex training	Combined interval and complex training	Df	F ratio
Pre-test means	3.89	3.92	3.82	2	0.48
Post-test means	4.01	4.88	4.78	2	4.59
Adjusted post-test means	3.69	3.72	3.81	2	4.70

The table shows the Pre-test means of interval training, complex training and combined interval and complex training were 3.89, 3.92 and 3.82. The obtained F-ratio for the pre-test was 0.48. The pre-test mean F-ratio was insignificant at 0.05 level of confidence. It prove that there were no significant differences between the experimental groups. It indicates that the groups process was perfect while assigning the subjects to groups.

1.65, and complex training group with mean value of 1.88. ANCOVA is used to analysis of pre and post test scores and adjusted mean scores of the players. F values were 1.10, 19.70 and 18.20. F value on pre-test scores are not significant and F values on post-test and adjusted means were significant at 0.05 level of confidence. these are greater than table value. Scheff's post hoc test proves that twelve weeks training combined and complex groups are improved stride length of football players.

### Stride Frequency (60 Metres Run)

**Aim:** to measure the stride frequency of the player.

### Equipment's used:

stopwatch, test course and clapper.

### Procedure:

players were run fast about 60 metres to measure speed; the measurement of frequency was taken in the test zone of 30 metres. The time elapsed for the players to contacts of the players after the initial supporting phase in the test zone. recording the time taken for ten strides. Dividing the number of strides taken by the time recorded given the number of strides ran in one-second.

### Result and discussion-

ANCOVA of co variance of mean on interval, complex and combined interval and complex training on stride frequency

Post-test means of the interval training, complex training and combined interval and complex training were 4.01, 4.88 and 4.78. F-ratio for the post-test was 4.59. post-test mean F-ratio was significant at 0.05 level of confidence. it proves that the post-test means of the players were significant.

Adjusted post-test means of the interval training, complex training and combined interval and complex training were 3.69, 3.72 and 3.81. F-ratio



for the adjusted post-test means was 4.70. F-ratio was significant at 0.05 level of confidence. It proves that a significant difference among the means due to the experimental trainings on speed endurance. significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. On stride frequency, due to experimental training a significant difference on means.

From the table, the means of stride frequency among combined interval and complex training group was 3.82, interval training group with mean value of 3.89, and complex training group with mean value of 3.92. ANCOVA is used to analysis of pre and post test scores and adjusted mean scores of the players. F values were 0.48, 4.59 and 4.70. F value on pre-test scores are not significant and F values on post-test and adjusted means were significant at 0.05 level of confidence. these are greater than table value. Scheff's post hoc test proves that twelve weeks

training combined and complex groups are improved stride frequency of football players.

### 3. PERFORMANCE PARAMETERS

#### Kicking (Soccer Test)

**Purpose:** Football kicking ability of the player.

**Equipment's used:** 3 soccer balls and stopwatch. a restraining line.

#### Procedure:

At restraining line a soccer ball is placed. after signal, the test performer kicks the ball against the wall. Two soccer balls are placed 9 feet behind the restraining line in the centre of the test area. In the event of a kick, the test performer may retrieve the ball or use one of the two additional balls. Every kick must be kicked behind the restraining line. The number of legal kicks each 30 second period was recorded. score was the highest total of any four trials.

#### Result and discussion-

ANCOVA of co variance of mean on interval, complex and combined interval and complex training on kicking

	Interval training	Complex training	Combined interval and complex training	Df	F ratio
Pre-test means	25.60	25.88	25.78	2	0.48
Post-test means	32.06	32.66	33.66	2	5.95
Adjusted post-test means	31.10	30.72	33.81	2	5.88

The table shows the Pre-test means of interval training, complex training and combined interval and complex training were 25.60, 25.88 and 25.78. The obtained F-ratio for the pre-test was 0.48. the pre-test mean F-ratio was insignificant at 0.05 level of confidence. It prove that there were no significant differences between the experimental groups. It indicates that the groups process was perfect while assigning the subjects to groups.

Post-test means of the interval training, complex training and combined interval and complex training were 32.06, 32.66 and 33.66. F-ratio for the post-test was 5.95. post-test mean F-ratio was significant at 0.05 level of confidence. it proves that the post-test means of the players were significant.

Adjusted post-test means of the interval training, complex training and combined interval and complex training were 31.10, 30.72 and 33.81. F-ratio for the adjusted post-test means was 5.88. F-ratio was significant at 0.05 level of confidence. It proves that a significant difference among the means due to the experimental trainings on speed endurance. significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's

post hoc test. On kicking, due to experimental training a significant difference on means.

From the table, the means of kicking among combined interval and complex training group was 25.78, interval training group with mean value of 26.60, and complex training group with mean value of 25.88. ANCOVA is used to analysis of pre and post test scores and adjusted mean scores of the players. F values were 0.48, 5.95 and 5.88. F value on pre-test scores are not significant and F values on post-test and adjusted means were significant at 0.05 level of confidence. these are greater than table value. Scheff's post hoc test proves that twelve weeks training combined and complex groups are improved kicking of football players.

#### Dribbling (Football Test)

**Aim:** measures Football dribbling ability.

**Markings:** 20-yard diameter was measured and marked. Around the circles a Twelve-inch cones were located at 5-yard intervals. A 3 feet perpendicular line were draw.

#### Procedure:

Players start dribbling the ball around the starting line. Players dribbles between the cones as quick as possible and back to starting line. Three trails have





been done, first one is clockwise, second one counter clockwise and third one direction of choice. The final test score are the combination of the two best trials.

### Results and Discussion of Dribbling

ANCOVA analysis of interval, complex and combined interval and complex training on dribbling

	Interval training	Complex training	Combined interval and complex training	Df	F ratio
Pre-test means	22.43	22.56	23.56	2	0.48
Post-test means	18.66	18.99	19.99	2	5.23
Adjusted post-test means	18.00	17.99	17.22	2	5.33

The table shows the Pre-test means of interval training, complex training and combined interval and complex training were 22.43, 22.56 and 23.56. The obtained F-ratio for the pre-test was 0.48. the pre-test mean F-ratio was insignificant at 0.05 level of confidence. It prove that there were no significant differences between the experimental groups. It indicates that the groups process was perfect while assigning the subjects to groups.

Post-test means of the interval training, complex training and combined interval and complex training were 18.66, 18.99 and 19.99. F-ratio for the post-test was 5.23. post-test mean F-ratio was significant at 0.05 level of confidence. it proves that the post-test means of the players were significant.

Adjusted post-test means of the interval training, complex training and combined interval and complex training were 18, 17.99 and 17.22. F-ratio for the adjusted post-test means was 5.33. F-ratio was significant at 0.05 level of confidence. It proves

that a significant difference among the means due to the experimental trainings on speed endurance. significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. On dribbling, due to experimental training a significant difference on means.

From the table, the means of dribbling among combined interval and complex training group was 23.56, interval training group with mean value of 22.43, and complex training group with mean value of 22.56. ANCOVA is used to analysis of pre and post test scores and adjusted mean scores of the players. F values were 0.48, 5.23 and 5.33. F value on pre-test scores are not significant and F values on post-test and adjusted means were significant at 0.05 level of confidence. these are greater than table value. Scheff's post hoc test proves that twelve weeks training combined and complex groups are improved dribbling of football players.

### SUMMARY AND CONCLUSIONS

The study was to find out the isolated and combined effect of interval training and complex training on selected endurance, speed and performance parameters among football players. To achieve this study, fifty football players from OPJS university, Rajasthan, India were selected and their ages ranged from 19 to 26 years. Players were divided into three equal groups. Group I is for Interval Training, Group II acted as Complex training and Group III acted as Combined Interval & Complex Training.

The duration of experimental period was 12 weeks. all the fifty players were tested on their selected endurance, speed and performance parameters.

This final test scores formed as post test scores. The pre-test and post test scores were analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences. 'F' ratio for adjusted test was found to be significant. Scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses.



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