

EFFECT OF PLYOMETRIC TRAINING AND SAQ TRAINING FOLLOWED BY DETRAINING ON AGILITY OF INTER-COLLEGIATE LEVEL FOOTBALLERS

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ABSTRACT: Thirty male soccer players aged between 18 and 26 years from Nirmala college in Ernakulam District, Kerala were selected. They were randomly divided into three groups of ten each, out of which group I (n = 10) consisted of SAQ (speed, agility, quickness) training, group II (n = 10) consisted Plyometric training and group III (n = 10) consisted control group. The dependant variable was agility. The season of training period was divided into three. The first training season was later pre-season, which consisted of four weeks of training with three days (three sessions) of training and before the training session was a rest day. The second training season was the In-season, which consisted of two weeks with two days (two sessions) of training and before the training session was a rest day. The third training season was in the closed-season, which consisted of two weeks. The subjects of SAQ group and Plyometric group were made to undergo de-training. Pre-test was conducted for all the three groups before giving the training and post-test was conducted after 6 weeks of training. The de-training effect was measured after the two weeks of de-training. The statistical technique used was ANCOVA. The results of the study showed that SAQ training improved agility better than Plyometric training. The results of the 2 weeks de-training programme showed that SAQ training improved agility better than Plyometric training among the male inter-collegiate level footballers.

Keywords: Plyometric training, SAQ training and Football.

INTRODUCTION

Soccer practitioners require many attributes to become successful players. These include cardiovascular fitness, muscle strength, endurance, flexibility, agility, coordination, skill and tactical knowledge [1]. Few players possess 'natural ability' in all areas. Indeed, the vast majority of players undergo training programmes, in some or all attributes, to improve their ability on the field. An understanding of basic anatomy and physiology and knowledge of muscle actions

during soccer skills such as running, kicking, jumping, heading and throwing will be useful to the player, coach, trainer and medical staff [2]. This knowledge may be employed in the design of training programmes to enhance the performance of soccer skills, injury prevention, diagnosis, and rehabilitation programmes [3]. (Tracey Howe, 1996)

Bio motor abilities are the foundations of ability of an individual to perform an exercise – strength, endurance, speed, coordination, flexibility and agility. The contribution of the bio motor abilities to the attainment of high performance is determined by two factors; the ratio between them as a reflection of the specifics of the sport and by the level of development of each ability according to its degree of participation in performing the sport/event [4]. Speed endurance training significantly improves your recovery after a bout of repetitive sprints. Your body's ability to remove lactic acid increases which can make such a difference to your game. Thirdly, a soccer speed training program should improve agility, foot speed and reaction time. Exercises to improve agility don't tend to be physically taxing [5]. The emphasis is on short, sharp movements of a high quality. Strength or muscular endurance is the ability of a muscle group to perform repeated, high-intensity movements. Strength endurance is essential for soccer - and like power, perhaps more essential than all-out strength [6]. At some point in your soccer training routine you should focus on developing strength endurance. Agility is the ability to change direction without the loss of speed, strength, balance, or body control. The performances of athletes who compete today have raised the level of agility. The physical conditioning of athletes has led to a number of changes in teaching, coaching, and training. These changes have allowed for a planned and implemented process that leads to improved performance through greater agility, balance and timing [7]. This new emphasis leads to the evolution of faster, stronger and better conditioned athletes and to elite performances by athletes.

METHODOLOGY

Thirty male soccer players aged between 18 and 26 years from Nirmala College in Ernakulam District, Kerala were selected. They were randomly divided into three groups of ten each, out of which group I (n = 10) consisted of SAQ (speed, agility, quickness) training, group II (n = 10) consisted Plyometric training and group III (n = 10) consisted control group which was not given any training. The dependent variable was agility. Agility was measured by shuttle run. The season of training period was divided into three. The first training season was later pre-season,

which consisted of four weeks of training with three days (three sessions) of training and before the training session was a rest day. The second training season was the In-season, which consisted of two weeks with two days (two sessions) of training and before the training session was a rest day. The third training season was in the closed-season, which consisted of two weeks. The subjects of SAQ group and Plyometric group were made to undergo de-training. Each training session started with light warm-up and ended with cool-down exercises. Each work out session lasted for 60-75 minutes. After the first half of the training five minutes were given as the rest period.

TRAINING SCHEDULE

Table 1: SAQ TRAINING EXERCISES

EXERCISES	LOW INTENSITY	MEDIUM INTENSITY	HIGH INTENSITY
1	butt-kicks	high knee forward	ladder speed run
2	high knee forward	high knee side ward	run over micro hurdle
3	high knee side ward	ladder speed run	-----
4	ing starts	run over micro hurdle	partner resisted run
5	zag run forward	zigzag run forward	adder zigzag cross over
6	zigzag run side ward	zigzag run side ward	figure eight
7	zigzag run back ward	ladder zigzag cross over	z- pattern run
8	s- drill	s- drill	-----
9	rope skipping	single leg rope skipping	-----
10	in place angle jump	cross lateral skaters	cross lateral skaters
11	scissors jump	scissors jump	-----
12	lateral skaters	lateral skaters	single leg hop

Table 1.1: LOW INTENSITY SAO TRAINING PROGRAM FOR SOCCER PLAYERS (FIRST TWO WEEKS OF TRAINING)

DAYS	SUN	MON	TUE	WEN	THE	FRI	SAT
MORN	rest	SAQ training program	active rest	SAQ training program	active rest	SAQ training program	active rest
REP/ SETS	-----	12 x 3	miner game	12 x 3	miner game	12 x 3	miner game

Table 1.2: MEDIUM INTENSITY SAO TRAINING PROGRAM FOR SOCCER PLAYERS (SECOND TWO WEEKS OF TRAINING)

DAYS	SUN	MON	TUE	WEN	THE	FRI	SAT
MORN	rest	SAQ training	active rest	SAQ training	active rest	SAQ training	active rest
REP/ SETS	-----	12 x 4	miner game	12 x 4	miner game	12 x 4	miner game

Table 1.3: HIGH INTENSITY SAO TRAINING PROGRAM FOR SOCCER PLAYERS (THIRD TWO WEEKS OF TRAINING)

DAYS	SUN	MON	TUE	WEN	THE	FRI	SAT
MORN	Rest	SAQ training	active rest	active rest	SAQ training	active rest	active rest
REP/ SETS	-----	8 x 4	miner game	miner game	8 x 4	miner game	miner game

Table 2: PLYOMETRIC TRAINING EXERCISES

EXERCIE	LOW INTENSITY	MEDIUM INTENSITY	HIGH INTENSITY
1	butt-kicks	double leg hop	single leg hop
2	double leg hop	double leg jump side ward	Medicine ball throw in single hand
3	double leg jump	Medicine ball throw	single leg hop side

	side ward	sitting	ward
4	Medicine ball throw sitting	Medicine ball scoop toes	z- pattern cuts
5	Galloping	single leg rope skipping	single leg stride jump
6	in place angle jump	cross lateral skaters	cross lateral skaters
7	scissors jump	scissors jump	tuck jump
8	lateral skaters	lateral skaters	star jump

Table 21: LOW INTENSITY PLYOMETRIC TRAINING PROGRAM FOR SOCCER PLAYERS (FIRST TWO WEEKS OF TRAINING)

DAYS	SUN	MON	TUE	WEN	THE	FRI	SAT
MORN	rest	plyometric training	active rest	plyometric training	active rest	plyometric training	rest
REP/ SETS	-----	8 x 4	miner game	8 x 4	miner game	8 x 4	-----

Table 2.2: MEDIUM INTENSITY PLYOMETRIC TRAINING PROGRAM FOR SOCCER PLAYERS (SECOND TWO WEEKS OF TRAINING)

DAYS	SUN	MON	TUE	WEN	THE	FRI	SAT
MORN	rest	plyometric training	active rest	plyometric training	active rest	plyometric training	active rest
REP/ SETS	-----	8 x 3	miner game	8 x 3	miner game	8 x 3	miner game

Table 2.3: HIGH INTENSITY PLYOMETRIC TRAINING PROGRAM FOR SOCCER PLAYERS (THIRD TWO WEEKS OF TRAINING)

DAYS	SUN	MON	TUE	WEN	THE	FRI	SAT
MORN	rest	plyometric training	active rest	active rest	plyometrics training	active rest	active rest
REP/ SETS	-----	8 x 3	miner game	miner game	8 x 3	miner game	miner game

Pre-test was conducted for all the three groups before giving the training and post-test was conducted after 6 weeks of training. The de-training effect was measured after the two weeks of de-training. The statistical technique used was ANCOVA.

ANALYSIS OF DATA AND RESULTS OF THE STUDY

In all conditions the significant level was fixed at 0.05, which was considered to be appropriate since the nature of this study did not demand more stringent level of significance.

Agility

The data collected from pre test, post test and after the detraining test on SAQ training group, Plyometrics training group and the control group have been statistically analyzed and presented in Table 3

Table 3: Analysis of covariance of control group, SAQ training group and the plyometrics training group on Agility

Source of variation	df	SSx	SSy	SSxy	SSyx	MSSyx	F
Between	2	1.149147	1.816347	1.350107	-0.00739	-0.00369	*12.8648
Within	26	-0.1482	-0.81545	-0.34922	0.007466	0.000287	
Total	28						

*Significant at .05 level of confidence

'F' value required at 0.05 level=3.37

The adjusted post test mean of control group is 16.24705, SAQ group is 16.47804 and the plyometrics group is 16, 84746, resulting in an 'F' ratio of 12.8648, which indicates a statistical significant difference at .05 level of confidence. The above statistical analysis indicates that there was significant variation among the three groups after the training period further, to determine which of the paired means has a significant difference; LSD test was applied. The result of the LSD test is presented in Table 3.1.

Table 3.1: Mean Difference among control group, SAQ training group and the plyometrics training group on Agility

CONTROL	SAQ	PLYOMTRC	MD	CD(5% LEVEL)
16.24705		16.84746	-0.60041*	0.015808
16.24705	16.47804		-0.23099*	
	16.47804	16.84746	-0.36942*	

Table 3.1 shows the adjusted post test mean difference between SAQ group and control group as 0.23099 which was statistically significant at .05 level of confidence. The adjusted post test mean difference in Plyometrics group and control group as 0.60041 which was also statistically significant at .05 level of confidence. Since the adjusted post test mean of SAQ and Plyometrics group is 0.36942, which was also statistically significant at .05 level of confidence.

Table – 3.2: DESCRIPTIVE STATISTICS OF AGILITY

Groups		pre test	post test	De training	No
CON	Mean	14.47	14.40	14.39	10
	SD	.33	.27	.26	
SAQ	Mean	14.48	14.20	14.20	10
	SD	0.23	0.13	0.13	
PLMTS	Mean	14.89	14.80	14.91	10
	SD	.61	.58	.58	

Table -3.2 indicates that the pre-test, post test, detraining mean and standard deviation value of Agility test. The pre-test mean and standard derivation values of agility test was in control group was $14.7 \pm .33$, The post-test mean and standard derivation values of the agility test in control group was $14.40 \pm .27$, and the detraining test mean and standard derivation values of the agility test in control group was $14.39 \pm .26$. The pre-test mean and standard derivation values of agility test in SAQ group was $14.48 \pm .23$, The post-test mean and standard derivation values of the agility test in SAQ group was $14.20 \pm .13$, and the detraining test mean and standard derivation values of the agility test in SAQ group was $14.20 \pm .13$. The pre-test mean and standard derivation values of agility test in plyometrics group was $14.89 \pm .61$, The

post-test mean and standard derivation values of the agility test in plyometrics group was $14.80 \pm .58$, and the detraining test mean and standard derivation values of the agility test in plyometrics group was $14.91 \pm .58$.

Agility (Detraining)

The data collected from pre test, post test and after the detraining test on SAQ training group, Plyometrics training group and the control group have been statistically analyzed and presented in Table 4.

Table 4: Analysis of covariance of control group, SAQ training group and the plyometrics training group on post test and detraining test of Agility

Source of variation	df	SSx	SSy	SSxy	SSyx	MSSyx	F
Between	2	1.816347	2.72394	2.21928	-0.09732	-0.04866	12.9962*
Within	26	-0.81545	-1.72291	-1.21833	0.097352	0.003744	
Total							

*Significant at .05 level of confidence

F' value required at 0.05 level=3.37

The adjusted post test mean of control group is 4.964, SAQ group is 4.863175 and the plyometrics group is 5.033661, resulting in an 'F' ratio of 12.9962 which indicates a statistical significant difference at .05 level of confidence. The above statistical analysis indicates that there was significant variation among the three groups after the training period further, to determine which of the paired means has a significant difference; LSD test was applied. The result of the LSD test is presented in Table 4.1.

Table 4.1: Mean Difference among control group, SAQ training group and the plyometrics training group on post test and detraining test of Agility

CONTROL	SAQ	PLYOMETRIC	MD	CD(5% LEVEL)
4.964		5.033661	-0.06966*	0.057084
4.964	4.863175		0.100825*	
	4.863175	5.033661	-0.17049*	

Table 4.1 shows the adjusted post test mean difference between SAQ group and control group as 0.100825 which was statistically significant at .05 level of confidence. The adjusted post test mean difference in Plyometrics group and control group -0.06966 which was also statistically significant at .05 level of confidence. Since the adjusted post test mean of SAQ and Plyometrics group -0.17049, which was also statistically significant at .05 level of confidence.

DISCUSSION

The results of the study indicate that after the six weeks period of training programme made improvement on agility for SAQ group and plyometrics training group soccer players, where as the SAQ Group have improved the agility significantly, when compared with the plyometrics training group. The results are in line with that of study earlier conducted by (Hespanhol 2006) found that six weeks training programme of SAQ over the changing of explosive strength improves agility [8].

The results of the detraining study indicate that the agility improved better for SAQ group than the Plyometrics group. In this, findings shows that the SAQ training need good recovery and the load before the competition should be medium.

CONCLUSIONS

From the analysis of the data the following conclusions were drawn

1. The comparison of pre and post test score of the SAQ group and plyometrics group in the agility test indicated that there is a significant improvement in the SAQ group than the plyometrics group.
2. The comparison of post and detraining test score of the SAQ group and plyometrics group indicated that the SAQ group improved agility better than the plyometrics group.

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