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EFFECT OF ISOTONIC AND ISOKINETIC STRENGTH TRAINING PROGRAM FOR THE DEVELOPMENT OF ANKLE STRENGTH OF SOCCER PLAYER

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Abstract
The purpose of the study was to see the effect of isotonic and isokinetic strength training program for the development of ankle strength of soccer player. The subjects selected for the study was 10 male football players with age ranged between 10-16 years from football academy of L.N.I.P.E. Gwalior. The ankle strength which was measured by isokinetic trainer humac norm cybex machine. To determine the effect of isotonic and isokinetic strength training program for the development of ankle strength of soccer player analysis of covariance test was used. All analyses were performed by SPSS version 20. The ANCOVA test estimated differences between the Pre and post test results. The analysis of data revealed that in the ankle Strength variable the significant difference was found in between the adjusted means of the isokinetic exercise group and control group and also the significant difference was found in between the adjusted means of the isokinetic exercise group and isotonic exercise group during post testing. And there is insignificant difference was found in between the adjusted means of the isotonic exercise group and control group during post testing.

***Key Words**: Physiological Variables, Football Player, Isotonic Training, Isokinetic Training.*

Introduction

Strength is the most important element in motor performance. Strength is a consistent differentiator of ability to make and to achieve success in sports. Young athletes develop strength through natural, unbroken movements such as jumps, throws and other body weight exercises. Proper strength training serves not only to improve overall performance, but also to secure the body and help the athlete avoid injury.Strength deserves considerable attention for soccer players. Players need to produce power when kicking a ball for long distance or shooting at the goal, when changing directions against their own momentum or that of an opponent, when accelerating quickly or jumping. Unfortunately, many people associate strength development and weight training with muscle bound individuals who are slow and have very limited flexibility. Research in this area of muscular development has shown this to be a misconception. Soccer players can and must work at improving their strength and power to play more effectively.

The role of strength preparation is highly valued in football. However, it is usually performed for character development, rather than for the specific work of the intramuscular system required in football. The role of strength preparation is crucial not only for increasing muscular strength, which by itself provides an advantage, but also for developing the specific training effects of strength exercises.

Hence, the purpose of the study was to see the effect of isotonic and isokinetic strength training program for the development of ankle strength of soccer player**.**

Materials and Methods

Subject; The subjects for this study were selected from the football academy held in LNIPE Gwalior 2014. The study was conducted on 10 male football players with the age ranged in between 10-16 years. Ankle strength was measured by isokinetic trainer humac norm cybex machine.

To determine the effect of isotonic and isokinetic strength training program for the development of ankle strength of soccer player analysis of covariance test was applied using SPSS version 20.

Findings: Findings pertaining to ankle strength pre and posttest male football players has been given in below

Table 1: Descriptive Statistics of Ankle Strength Test

	Isotonic Group		Isokinetic Group		Control Group	
	Pre	Post	Pre	Post	Pre	Post
Mean	34.00	38.60	33.40	38.40	31.40	31.80
Median	35.00	38.00	32.00	38.00	32.00	33.00
Mode	30.00[a]	35.00[a]	30.00	35.00[a]	35.00	35.00
Std. Deviation	4.18	3.91	4.22	3.21	4.16	4.15

Table 1 reveals the descriptive statistics for the scores of Ankle Strength test on different strength trainings for tenweeks. The mean value and standard deviation for pretest Ankle Strength on different strength trainings were for isotonic group (34.00±4.18), isokinetic group (33.40±4.22) and control group (31.40±4.16)respectively and while for the post ankle strength test on different strength trainings for tenweeks and the mean value and standard deviation for posttest Ankle Strength t on different strength trainings were for isotonic group (38.60±3.91), isokinetic group (38.40±3.21) and control group (31.80±4.15)respectively.

Table 2: Test of Between Subject Effects for the Scores of Ankle Strength Test after Different Strength Trainings for Ten Weeks

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Pre_ Ankle Strength	38.405	1	38.405	22.965	0.001
Treatment group	33.158	2	16.579	9.914	0.003
Error	18.395	11	1.672		
Total	19029	15			
Corrected Total	89.733	14			

a. R Squared = .795 (Adjusted R Squared = .739)

Table 2 presents the test of between subject effects for the scores of ankle strength test before and after different strength trainings for ten weeks and it concluded that pretest score on ankle strength were significant as the 'P' is less than 0.05.

As in the case of post test scores of ankle strength it is also found significant as the 'P' value is less than 0.05. The result shows that the impact of different strength training is same in nature.

Table 3: Adjusted Mean Scores of Ankle Strength Test after Different Strength Trainings for Ten Weeks

Dependent Variable: Post Ankle Strength				
Treatment Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Isokinetic	37.494[a]	0.579	36.221	38.768
Isotonic	35.255[a]	0.619	33.893	36.617
Control	33.850[a]	0.611	32.505	35.196

[a]Covariates appearing in the model are evaluated at the following values: Pre Ankle Strength = s31.8000.

Table 3 represents the estimated scores of Ankle Strength test after different strength training for ten weeks for different strength trainings i.e. Isokinetic strength trainings group (37.494[a]), isotonic strength trainings group (35.255[a]), and Control group (33.850[a]).

Table 4: Pair Wise Comparisons for the Scores of Ankle Strength after Different Strength Trainings for Ten Weeks

(I) Treatment Group	(J) Treatment Group	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval For Difference[b]	
					Lower Bound	Upper Bound
Isokinetic	Isotonic	2.239*	0.853	0.024	0.362	4.117
	Control	3.644*	0.837	0.001	1.803	5.485
Isotonic	Isokinetic	-2.239*	0.853	0.024	-4.117	-0.362
	Control	1.405	0.919	0.154	-0.617	3.427
Control	Isokinetic	-3.644*	0.837	0.001	-5.485	-1.803
	Isotonic	-1.405	0.919	0.154	-3.427	0.617

Based on estimated marginal means

*The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

It is evident from table 4 that means difference of scores of Ankle Strengthbetween isokinetic strength training group and isotonic strength training group were significantly different as the 'p' value is less than 0.05. In case of isokinetic strength training group and control group also the mean difference was found to be significant the 'p' value is less than 0.05. Whereas in the isotonic strength training group and control group was found insignificant, as the 'p' value is more than the 0.05.

As the above results shows that in between all the groups (i.e. isokinetic strength training group, isotonic strength training group and the control group), the isokinetic group was found to be better than the other treatment group.

Discussion and Conclusion

The analysis of data revealed that in the ankle Strength variable the significant difference was found in between the adjusted means of the isokinetic exercise group and control group and also the significant difference was found in between the adjusted means of the isokinetic exercise group and isotonic exercise group during post testing.And there is insignificant difference was found in between the adjusted means of the isotonic exercise group and control group during post testing.

Hence, it may be inferred that isokinetic exercise group is effective for the development of ankle strength. As the isokinetic Exercise performed using a specialized apparatus here we used cybex isokinetic dynamometer that provides variable resistance to a movement, so that no matter how much effort is exerted, the movement takes place at a constant speed and for ankle strength training was given on dorsi flexion. So, there is increase in strength and balance ability may be related to promotion of the proprioceptive senses, due to strength exercise, since proprioceptive function is an important factor for ankle strength and balance ability (Lackner JR, Dizio P 2005). Strength exercise can activate proprioceptive functions, which might provide feedback to the joint, increase stimulation of the mechanoreceptors, such as the muscle spindle, Golgi tendon organ and Ruffini nerve endings around the joint(Hilberg et al ,2003).

Isokinetic Exercise performed on cybex isokinetic dynamometer provides variable resistance to a movement, which increase in strength and balance ability related to promotion of the proprioceptive senses, this function is an important factor for ankle strength and balance ability (Lackner JR, Dizio P 2005). In the present study also Ankle strength was developed by isokinetic exercises. The isokinetic exercise program used in (SekirU, 2007) had a positive effect on strength, functionality and proprioception in athletes with functional ankle instability. (Denise & Anthony 2000) findings also support that eccentric and concentric isokinetic strength training enhances the control and production of ankle muscle dorsi flexor torque in older adults, with implications for improving functional mobility of the ankle joint.Strength exercise activate proprioceptive functions, which provide feedback to the joint, increase stimulation of the mechanoreceptors, such as the muscle spindle, Golgi tendon organ and Ruffini nerve endings around the joint(Hilberg et al, 2003). (Carrie L. Dochertyet al. 1998) the isokinetic Ankle-strengthening exercises improved strength, inversion JPS, dorsiflexion JPS, and plantar flexion JPS in subjects with functionally unstable ankles.

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