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COMPARATIVE STUDY OF ANGULAR KINEMATICAL VARIABLES BETWEEN BEGINNERS AND ADVANCED SOCCER PLAYERS IN RELATION TO INSTEP KICK



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ABSTRACT

Introduction: Success of any soccer kick depends on various factors including the distance of the kick from the goal, the type of kick used, the air resistance and the technique of the main kick, which is best, described using biomechanics analysis. Objectives: 1) the first objective of the study to characterize the level of angular kinematical variables of Beginners and Advanced Soccer Players in relation to Instep Kick. 2) The second objective of the study to compare the Angular Kinematical Variables between Beginners and Advanced Soccer Players in relation to Instep Kick. Materials and Methods: Ten male soccer players divide into two groups, five advance players

who represented university level, and five beginners' players were selected as subject. Sequential photographic technique was employed to analyze the kick. From the photographs the "elgon" were prepared by using protector to obtain various angular kinematical variables, Descriptive and T- test was used to assess and to find out significant difference between beginners and advance soccer players. Results: Mean and SD of beginner's soccer player 155.0 ± 10.77 , 166.2 ± 12.53 , 119.4 ± 15.04 , 162.8 ± 6.68 , 149.4 ± 13.55 , 118.4 ± 12.62 (Angle at hip joint (right and left), angle at knee joint (right and left), and angle of ankle joint (right and left) and advance soccer players was 160.4 ± 12.97 , 167.0 ± 8.60 , 128.2 ± 11.05 , 145.0 ± 7.41 , 123.6 ± 8.64 , 94.4 ± 12.17 in relation (Angle at hip joint (right and left), angle at knee joint (right and left), and angle of ankle joint (right and left) respectively. Cal. t value was found 0.72, 0.12, 1.05, 3.98, 3.58, and 3.06 respectively. Conclusions: 1) Insignificant difference was found between Beginners and Advanced Soccer Players in relation to Angle at hip joint (right and left), knee joint (right). 2) Significant difference was found knee joint (left), and angle of ankle joint (right and left).

KEYWORDS : Advance, Beginner, Instep Kick, Kinematical, Soccer .

INTRODUCTION :

Biomechanics is an applied form of mechanics and methods used to investigate it must be derived from those of mechanics. However biomechanics have not developed in the wake of mechanics, but as a bordering science in other scientific disciplines such as Anatomy, Physiology and

the technique of sports [1]. So, people who are working in this field should have a basic knowledge about how a body moves, what are the major groups of muscles, joint and in what proportion and degree they are to be used to get an optimum output. The approach can provide an understanding of the nature of any skill, their economic way of execution, and their dependent factors, which in turn, can build into an awareness of the larger scheme of economic movement [2]. While talking about the kicking in soccer, there are several types of kicks. In each case the ultimate success of the kick depends on the speed, height and angle and which the ball leaves the kickers foot and on the air resistance it encounters enroot. The speed and angle at which the ball leaves the foot is governed by the same factors that determine the result of any elastic impact. The mass and initial velocity of the body involved and there coefficient of restitution [3]. new aspect of soccer kick performance are being identified, including more details regarding the three-dimensional kinematics of the movement, joint-moment that drive the movement, mechanisms of soccer performance as well as various factors which effect soccer kick biomechanics such as age, gender, limb dominance and fatigue. The aim of the present study was to examine recent finding on soccer kicking biomechanics and to identify new aspect that may be decisive for soccer kick performance [4].

OBJECTIVES OF THE STUDY

- 1) The first objective of the study to characterize the level of angular kinematical variables of Beginners and Advanced Soccer Players in relation to Instep Kick.
- 2) The second objective of the study to compare the Angular Kinematical Variables between Beginners and Advanced Soccer Players in relation to Instep Kick.

MATERIALS AND METHODS

Ten soccer players was randomly selected for this study further it was divided into two group of five advances(Interuniversity Level) and five beginner soccer players respectively. Each subject took five trials and the best performance was used for the analysis. Sequential photography was employed for the analysis of instep kick action of the subjects. The camera used for this purpose was a standard Nikon Model Em (with motor drive). For obtaining individual photographic sequence, the subjects were photographed in a controlled condition. The distance of this camera to the subjects was perpendicular about 4.53 meters and was fixed at 1.25 meters height. The camera was operated by an expert professional photographer. On the basis of the photographs obtained the investigator developed the stick figures from which various kinematical variables (Angle at hip joint (right and left), angle at knee joint (right and left), and angle of ankle joint (right and left) were taken. The stick figures were developed by using joint point method in which the body projections at the joints facing the camera were considered. The angular kinematical variables were calculated by protector. The data was collected at the moment of execution in performing In Step Kick.

ANALYSIS AND INTERPRETATION OF RESULTS

The data on different angular kinematical variables i.e., hip, knee, and ankle joint at execution phases were measured. t – Ratio was computed to find out the significant difference between the means of both the advance and beginner players and descriptive [5] statistics was used to characterize the level of angular kinematical variables at the moment of execution. The level of significance as set at .05.

Table 1
 MEANS AND STANDARED DEVIATIONS OF SELECTED ANGULAR KINEMATIC VARIABLES FOR INSTEP KICK

Phase	Joints	Advance Players		Beginners Players	
		Mean	S.D.	Mean	S.D.
Execution	Right Hip	160.4	12.97	155.0	10.77
	Right Knee	167.0	8.60	166.2	12.53
	Right Ankle	128.2	11.05	119.4	15.04
	Left Hip	145.0	7.41	162.8	6.68
	Left Knee	123.6	8.64	149.4	13.55
	Left Ankle	94.4	12.17	118.4	12.62

Table -1 reveals that Beginners soccer players were having mean and SD were 155.0 ± 10.77 , 166.2 ± 12.53 , 119.4 ± 15.04 , 162.8 ± 6.68 , 149.4 ± 13.55 , 118.4 ± 12.62 in relation to (Angle at hip joint (right and left), angle at knee joint (right and left), and angle of ankle joint (right and left). Beginners' players were having greater mean in relation to right knee in comparison to Right Hip, Right Ankle, Left Hip, Left Knee, and Left Ankle.

Table -1 also reveals that Advance soccer players were having mean and SD were 160.4 ± 12.97 , 167.0 ± 8.60 , 128.2 ± 11.05 , 145.0 ± 7.41 , 123.6 ± 8.64 , 94.4 ± 12.17 in relation Angle at hip joint (right and left), angle at knee joint (right and left), and angle of ankle joint (right and left). Advance Soccer players were having greater mean in relation angle of hip joint left in comparison to Angle at hip joint (right), angle at knee joint (right and left), and angle of ankle joint (right and left).

Fig.1
 Graphical Representation of Mean and SD of Beginner Soccer Players

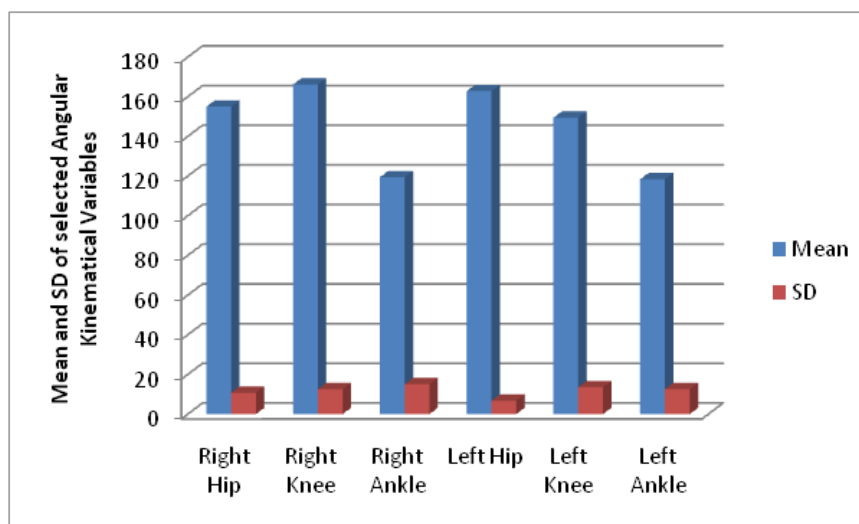


Fig.2
Graphical Representation of Mean and SD of Advance Soccer Players

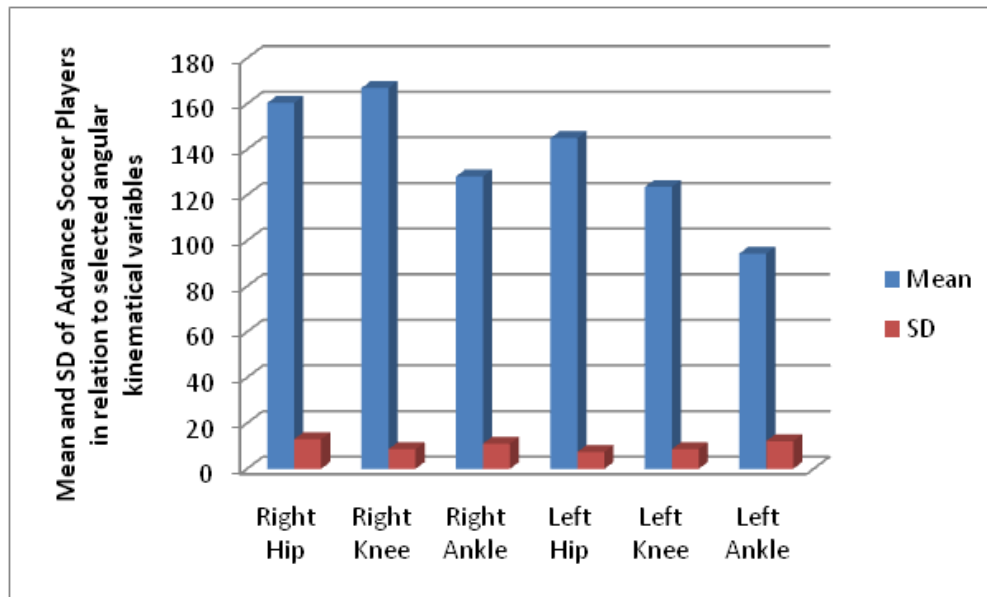


Table 2
Comparison of Selected Angular Kinematical Variables between Advance and Beginners Soccer Players at the moment of Execution

S. No.	Variables	Players	Means	Mean difference	S. D. Error difference	t-ratio
1.	Right Hip	Advance	160.4	5.40	7.5	0.72
		Beginners	155.0			
2.	Right Knee	Advance	167.0	.80	6.8	0.12
		Beginners	166.2			
3.	Right Ankle	Advance	128.2	8.80	8.3	1.05
		Beginners	119.4			
4.	Left Hip	Advance	145.0	17.8	4.4	3.98*
		Beginners	162.8			
5.	Left Knee	Advance	123.6	25.8	7.9	3.58*
		Beginners	149.4			
6.	Left Ankle	Advance	94.4	24.0	7.8	3.06*
		Beginners	118.4			

*Significant at 0.05 level of confidence. $t_{.5}(8) = 2.30$

Table-2 reveals that significant difference was found between Advance and Beginners soccer players in relation to Left hip, Left Knee and Left Ankle because calculated t value 3.98, 3.58 and 3.06 was greater than tabulated value 2.30.

Table-2 also reveals that insignificant difference was found between Advance and Beginners

soccer players in relation to Right Hip, Right Knee, and Right Ankle because calculated t value 0.72,0.12,1.05 was found less than the tabulated value.

DISCUSSION OF FINDINGS

The finding reveal that there are significant difference in angular at left hip joint, left knee joint, left ankle joint. At the moment of execution in between the advance and beginners level soccer players. Instep kick involve movement of different joints like flexion, extension, hyper flexion, hyper extension etc, hence large range of movements are possible at the movement of execution. The kicking foot has to go below the ball as much as possible and give scooping effect this might be due to combination of planter flexion, lateral flexion and inversion of the foot. The difference at various angles may be due to the nature of various styles of kicking the ball. Players develop their own style of kicking while the technique is same. It may be also differ due to the playing experience of the players because they feels more efficient in their own particular style of the particular technique. One more fact may be there that the physical variable between advance and beginners players also different the angle of left hip joint, left knee joint and left ankle has a higher relationship with reference and helpful to maintain the upper body position and if the lean back-ward the ball will covered a large distance in a air. Physical variable has a significant relationship with the performance of kicking distance. It is well known then the length of body segments is because the greater range of movements and for maximum force. The leg strength and back strength also have close relationship with the performance as strength is contributing factors.

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