

DELIVERY STRIDE LENGTH AS A PREDICTOR OF SHOULDER COUNTER ROTATION OF PACE BOWLING IN CRICKET

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ABSTRACT

The purpose of the study is to find out the relationship between Delivery Stride Length and Shoulder Counter Rotation in Pace Bowling in Cricket. To fulfill the purpose, 11 male university level pace bowlers (Aged 21.91 ± 1.64 ; Height 1.654 ± 0.07) of VisvaBharati University were filmed in an outdoor field in a standard (20.12 m) cricket pitch. Two Dimensional Kinematic (2-D) data were collected by pointing two standard cameras from the direction of two planes (Transverse and Sagittal). For the acquisition of kinematic data subject's Shoulder Alignment at Back Foot Contact and Front Foot Contact, Shoulder Counter Rotation and Delivery Stride Length was analyzed in Kinovea Software (8.25 version). In statistical analysis Pearson Product Moment correlation shows significant relationship ($r=0.59$) between Delivery Stride Length and Shoulder Counter Rotation of the pace bowlers. From the obtain result it is concluded that in Pace Bowling, Delivery Stride Length and Shoulder Counter Rotation having significant relationship and Delivery Stride Length can be a strong predictor of Shoulder Counter Rotation.

Key words: Pace Bowling, Cricket, Shoulder Counter Rotation, Delivery Stride Length.

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1. INTRODUCTION

Bowling performance in cricket has an attractive feature with accomplishment of multiple strenuous physical activities with multiple applications of mechanics. Fast bowling is a dynamic activity with following the steps of Run up, Backfoot contact, Frontfoot contact and deliver the ball with maximum speed and also with greater accuracy. Delivery Stride length is a component where the bowler transferring the running momentum to deliver the ball. A

greater delivery stride length has no longer any advantageous effect on bowling performance outcomes such as ball release speed, accuracy and ball release height if it exceeded 75-85% of standing height. As a other factor stride length may have an effect on contact time, anteroposterior braking and propulsive force and impulse descriptors, and vertical impulse as the length increases. A larger horizontal braking associated and key determinant of a faster ball. As a result of this bowlers try to acquire a large delivery stride length. SCR is the change in alignment of the shoulders, rotating away from the batsman, between back foot contact (BFC) and front foot contact (FFC) during the bowling delivery stride. Shoulder Counter Rotation (SCR) has a great impact on ball release speed and accuracy in fast bowling in cricket .

1.1. Aim

To find out the Relationship between Delivery Stride Length and Shoulder Counter Rotation Of Pace Bowling in Cricket.

2. METHOD

2.1. Subject

Eleven (11) male Inter-university level pace bowlers (Aged 21.91 ± 1.64 ; Height (1.65 ± 0.07)) from Visva-Bharati cricket team were selected for the study.

2.2. Collection of Data

To obtain data subjects were filmed in an outdoor field in a standard (20.12 m) cricket pitch. Subjects ask to ball with the six deliveries at good length spot. Six (6) markers were attached to all pace bowlers for the reduction of kinematic data. Two Dimensional Kinematic (2-D) data were collected by two standard camera operated at a frame rate of 50Hz and 120 fps from the direction of two planes (Transverse and Saggital) at a height of 8m above from the ground and distance of 8 m from the stump respectively (Portus MR et al.,2000). The data were analyzed in Kinovea (8.25 version) software. For the purpose of the study the selected kinematic variables were shoulder alignment at BackfootContact, shoulder alignment at Frontfoot Contact and Delivery Stride Length were measured. To reduce the obtained data all transverse plane angular measures were relative to the pitch alignment in the direction of bowling measured in an anti-clockwise direction.



3. ANALYTICAL PROCEDURE

Descriptive statistic (Mean, SD) and PPM Correlation was applied in order to assess the influence the relationship between Delivery Stride Length (DSL) upon Height and Shoulder Counter Rotation of pace bowlers in cricket.

4. RESULTS & DISCUSSION

Table 1 Descriptive and Correlation of Delivery Stride Length (DSL) Upon Height and Shoulder Counter Rotation of Pace Bowlers in Cricket

Bowling Phase	N	Mean	SD	Maximum	Minimum	r
DSL upon Height (%)	66	66.76	3.5	75.15	59.25	0.59
SCR(degree)		37.65	13.86	64	8	

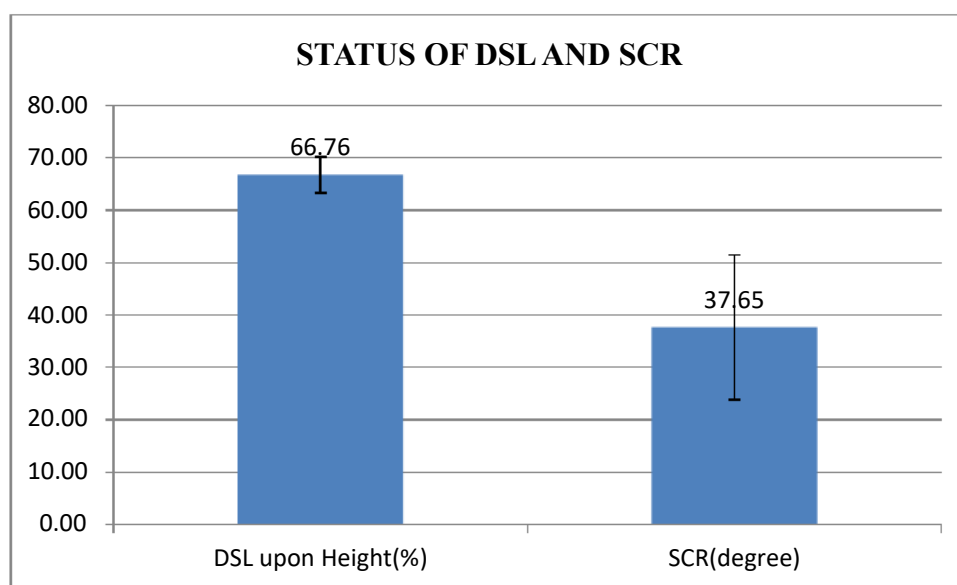


Figure 1 Graphical Representation of Mean and SD of Delivery Stride Length (DSL) upon Height and Shoulder Counter Rotation of pace bowlers in cricket.

Table 2 Descriptive Statistics of Delivery Stride Length (DSL) upon Height and Shoulder Counter Rotation as per the classification of Bowling Action

Bowling Action		N	MEAN	SD
Front on /Side on action(>30 degree)	SCR	20	20.7	7.3
	DSL upon Height		63.98	2.8
Mixed on action(<30 degree)	SCR	46	45.02	8.5
	DSL upon Height		68.0	3.1

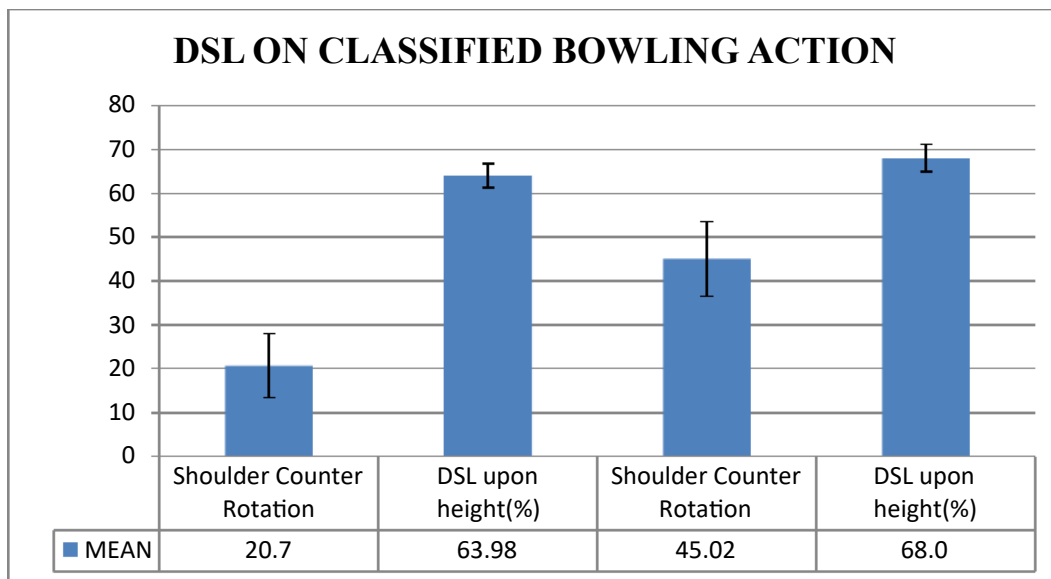


Figure 2 Graphical Representation of Mean and SD of Delivery Stride Length (DSL) upon Height and Shoulder Counter Rotation as per the classification of Bowling Action of pace bowlers in cricket

5. DISCUSSION OF FINDINGS

Table no1 reveals that the mean of percentage of Delivery Stride Length (DSL) upon Height was 66.76 ± 3.5 and Shoulder Counter Rotation was 37.65 ± 13.86 degree. There is significant positive relation between percentage of Delivery Stride Length (DSL) upon Height and Shoulder Counter Rotation, $r(66) = 0.59$ at 0.05 level. In Table No.2 further analyzed the pace bowlers as per the bowling action where mean of front on and side on bowlers ($SCR \leq 30^\circ$) was 20.7 ± 7.3 degree of Shoulder Counter Rotation with a mean percentage of Delivery Stride Length (DSL) upon Height was 63.98 ± 2.8 whereas mixed on ($SCR \geq 30^\circ$) bowlers possess 45.02 ± 8.5 degree of Shoulder Counter Rotation with percentage of Delivery Stride Length (DSL) upon Height was 68.0 ± 3.1 . It reveals the SCR increases as the percentage of Delivery Stride Length (DSL) upon Height increases.

6. CONCLUSION

From the findings it can be concluded that there is positive significant relation between Delivery Stride Length (DSL) and Shoulder Counter Rotation. The Delivery Stride Length can be a predictor of Shoulder Counter Rotation.

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