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A FUNDAMENTAL STUDY ON BASEBALL BATTING MOVEMENT FOCUS ON SLAPPING

Kazuki Yamada, Takumi Fujinaga, Keigo Nishita, Masahiko Seki, Hiroh Yamamoto

Kanazawa University, Ishikawa, Japan

The purpose of this study is to generate baseball batting style to hit more certainly and to investigate effectiveness it. The idea for new batting referred to bunt and slap hitting used by softball. This new batting style was named A Kourituteki Batting (AKB). 4 male university students participate in this experiment. Subject tried to swing 30 fast balls thrown from pitching machine. 30 trials were divided into 3 groups (right-handed, left-handed, AKB). The result of AKB is higher than left-handed groups. And, the height of loin for AKB is higher than the other groups. This result shows that it may be possible for a using AKB hit a ball more in batter box him always in. This experiment will be useful for considering more developed batting technique in baseball after this.

KEY WORDS: hit a ball, low posture, batted-ball direction.

INTRODUCTION: Baseball batting is complex behavior. And many investigators research this complex behavior. Previous research on baseball batting has focused on swing biomechanics and motor control physics of the ball flight and bat-ball contact. Many of this research investigate something to swing faster and to hit a ball further. But, it is difficult for beginner in baseball to hit a ball regardless ball speed. And, it is limited that the research focused on “hit a ball” for beginner or layman in baseball. And, bunt is the most stable batting in baseball. To consider this movement may improve baseball batting. So, a new batting to hit a ball easier for beginner in baseball is considered. And, the idea for the new batting referred to bunt and slap hitting used by softball.
The purpose of this study is to generate a new baseball batting style to hit more certainly and to investigate effectiveness it.

METHODS: A new batting style was named A KOSUI Batting (AKB). AKB referred to bunt and slap hitting used by softball. 4 male university students (height: 179 ± 12.4 cm, mass: 80 ± 9.6 kg, age: 23.3 ± 1.0) participate in this experiment. Subject tried to swing 30 fast balls thrown from pitching machine (Mizuno). All subjects are right-handed. And all subject signed informed consent forms. 30 trials were divided into 3 groups (right-handed, left-handed, AKB). This experiment was played three different conditions. First, pitched ball was set fastball of 140±5km/h in the center of strike zone. Second, pitched ball was same speed and stuff as first experiment, but the course was set in the inside and outside of strike zone. Third, pitched ball was set slider of 125±5km/h in the center of strike zone. This experiment was captured by two digital video cameras (DCR-TRV30, SONY). From the movie, it was checked the number of ball-bat contact in this experiment. The number of ball-bat contact was divided 3 groups (Fair, Foul, and Meet). Fair is the number of ball that flies to fair territory. Foul is the number of ball that flies to foul territory. Meet is the number of ball that Fair and Foul added. The batted ball direction of Fair is divided 9 directions (R1, R2, R3, R4, P, L1, L2, L3, L4). R means right side of baseball field. Similarly, L means left side of baseball field. P means that the ball hit the net set in front of pitching machine. And the movie of experiment analyzed by using motion analysis soft (Frame-DIAS 2, DKH) to calculate each subject’s height of loin within swing motion. A one-way ANOVA was used to compare among 3 batting styles. Post hoc tests were performed using the Tukey test. A significance level of 0.05 was set.

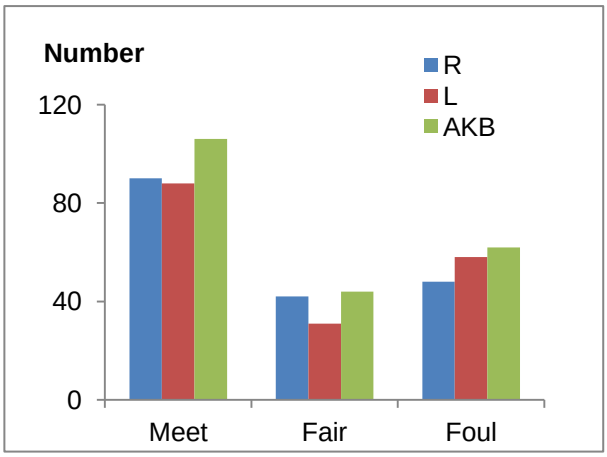

Figure 1. The sum of the number of each batting style's ball-bat contact

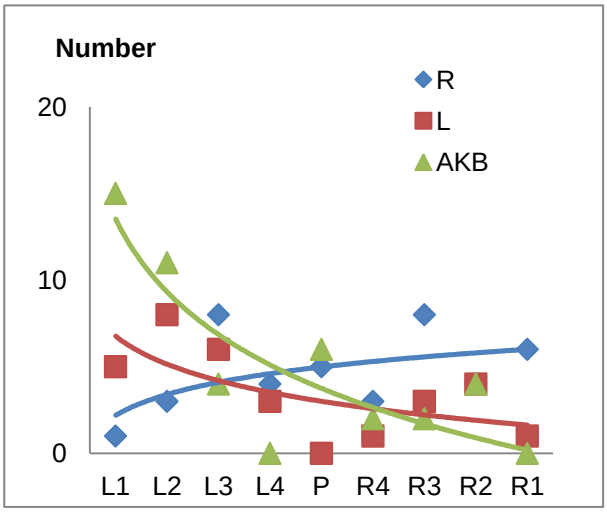

Figure 2. The sum of the number of each batting style's batted ball direction

RESULTS: Sum of the number of Fair, Foul, Meet are shown Figure 1. The result of right-handed is that the number of Meet is 90, Fair and Foul is 42 and 48 respectively. As for left-handed, the number of Meet, Fair and Foul is 88, 31 and 58 respectively. And, as for AKB, the number of Meet, Fair and Foul is 106, 44, and 62 respectively. About the number of Meet, AKB is higher than left-handed significantly. The batted ball direction of Fair is shown Figure 2. Height of loin while swing motion are shown Table. About maximum height of loin for each batting style, right-handed is higher than left-handed and AKB, and left-handed is higher than AKB. About minimum, average, impact phase's height of loin for each batting style, right-handed is higher than left-handed and AKB.

DISCUSSION: In this experiment, AKB's Meet is higher than left-handed's. This result shows that AKB is beneficial for hit a ball regardless batted ball speed. This is first goal for this study. And, about the batted ball direction of Fair, it is inclinable that AKB's batted ball direction pointed to third baseman. In other words, AKB hits a ball to more far position from first base. So, it may be possible that to use AKB hits more one-base hit than a usual batting style.
About height of loin while subject's swinging, AKB's height of loin is the lowest among the other batting style. The reason of this result is that AKB batting style caused this low posture. AKB referred to baseball's bunt. Also, bunt style is low posture. This low posture may be caused stable posture for hit a ball. It is considered that this low posture caused AKB's Meet high result.

	Max(cm)	Min(cm)	Impact(cm)
R	99.3±14.2	89.6±14.5	92.7±14.8
L	87.2±11.1	74.6±13.7	79.6±12.7
AKB	80.1±10.8	71.7±10.7	74.6±10.5
	Max(cm)	Min(cm)	Impact(cm)

Table 1. Three batting style's height of loin while swinging.

CONCLUSION: AKB shows that it may be beneficial for hit a ball. And, to use AKB hit a ball to third baseman or shortstop direction. So, it may be possible that to use AKB hits more one-base hit than a usual batting style. And, this study figure out that AKB's height of loin is the lowest among the other batting style. It is considered that this low posture caused AKB's Meet high result.

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