Comparative Study of Different Badminton Forehand Overhead Strokes: A Biomechanical Approach

Mottakin Ahmed

PhD Scholar L.N.I.P.E. Gwalior M.P, India

Abstract

The purpose of the present study is to analysis the Badminton Clear and Drop Shot mainly emphases on Forehand Strokes of Badminton angular kinematic.Total six no of male [N=6] right handed badminton players were selected for the purpose of the study who participated in inter university competition of Lakshmibai National Institute of Physical Education Gwalior from the badminton match Practice group. Whose age level was (19±6) and the mean height (169.9 cm), mean weight (67.7 kg).To find out the mean difference in selected kinematic variables between the Clear and Drop of badminton player. The independent t test was used for testing hypothesizes. The level of significance was set at 0.05. It sowed the significance where there is a difference of execution of Drop and clear shot in Badminton. Particularly having smaller angle in drop shot can generate more range of motion show it may generate speed. The data collected within this study is not possible to investigate all the mechanism of hip joint during execution of clear and drop shot but should be looked at in further in details in the future investigation using the simulation technique.

Introduction

The game Badminton has a number of fundamental technique of which forehand clear and Drop plays vital role. The natures of both the skill is almost similar but it has variation in terms velocity, Angle, muscles activation etc. Analysis of these technique has brought attention of research for last decades. To hit the shuttle one should have proper attention, focus, Control ability, Shuttle contact height, Wide range of contact angle which result in highest success rate in execution of strokes. Sports biomechanics is the study human motion. Biomechanics of human movement can be defined as inter discipline which describes, assess and analysis human movement. There are limited research which have been conducted on Sports Biomechanics which involves clear and Drop. However many research have been conducted in other which games are very similar to Badminton (Overarm Throw, Tennis serve). Gowitzke and Weddel(2000); Hussain et all (2013) Demonstrated several Biomechanical Principle can be applied to Badminton Games. Jumping during forehand overhead strokes is most popular technique chosen by the most top world ranked players. “Over and years filming and Timing have been perfected to aid in Research in achieving accurate time measurement to Badminton pattern. “(John and Dee, 1971). “The approach may providing understanding the nature of any skill, their economic way of execution of strokes, about their independent variables which influences the result, can built into an awareness of larger scheme of Economic movement”(Cloude, Barry and Mopherson, 1992).

Methods

Total six no of male [N=6] right handed badminton players were selected for the purpose of the study who participated in inter university competition of Lakshmibai National

Institute of Physical Education Gwalior from the badminton match Practice group. Whose age level was (19±6) and the mean height (169.9 cm), mean weight (67.7 kg).only angle of hip is selected as the variable. GO- pro hero camera was used for capturing of movement while executing the Drop and Smash. The frame rate of the camera was 119 frame/second. The distance of the camera from the performing area was 10 mts away and height was 120 mts. Subjects were asked for complete warm up before the execution of stroke. To obtain reliable measurement, the instruments which were used for the purpose of the present study, namely, tripod stand, video camera, steel tape, were all standard instruments available at the research laboratory and used competitive Badminton court, shuttle, racket, marker available in badminton hall of Lakshmibai National Institute of Physical Education, Gwalior, and there reliability were ensured by the manufactures.

Statistical procedure

To find out the mean difference in selected kinematic variables between the Clear and Drop of badminton players.The independent t test was used for testing the hypothesizes. The level of significance was set at 0.05.

Figure 1: At the time of execution forehand drop shot

Findings

The results of the independent t test which were obtained in order to ascertain the difference of selected angular kinematics variables i.e.: Hip Joint

TABLE-1

t-TABLE OF THE HIP JOINT WITH F VALUE FOR LEVENE'S TEST

Shoulder Joint	Means	Std. Deviation	Mean Difference	Std.Error of mean difference	t value	p value	F value	p value
Clear	170.80	3.70	12.61	1.65	2.86	**0.021***	0.10	0.76
Drop	163.00	4.84						

***Significant level 0.05**

Interpretation of result

The following Interpretation can be done on the basis of result shown in figure

- In the above table Standard deviation, mean, and standard error of the mean for the hipangle on Clear and Drop. The mean angle of Clear is more than of Drop however difference is whether significance or not cannot be revealed only through t-value and its Associates p-value.
- One of the Assumption for using two sample Ratio-test for unrelated groups are that variance of two group must be equal. To test the equality of variance Levene's test was used. In above table F-value 0.1>0.05. thus , null hypothesis of equality of variance may be accepted, and it can be concluded that variances of two groups are equal
- It can be seen in the above table the value of t-statistics is 2.86. This t-value is significant as its p value is 0.021 which is less than 0.05. Hence the null hypothesis of equality of the population means is rejected, it may be concluded the average Hip angle of Clear and Drop is Different. Average hip angle of Drop is less than clear which may be concluded that to Drop the shuttle one has to keep the shuttle more in front to hit deeper with different flight height of the shuttle

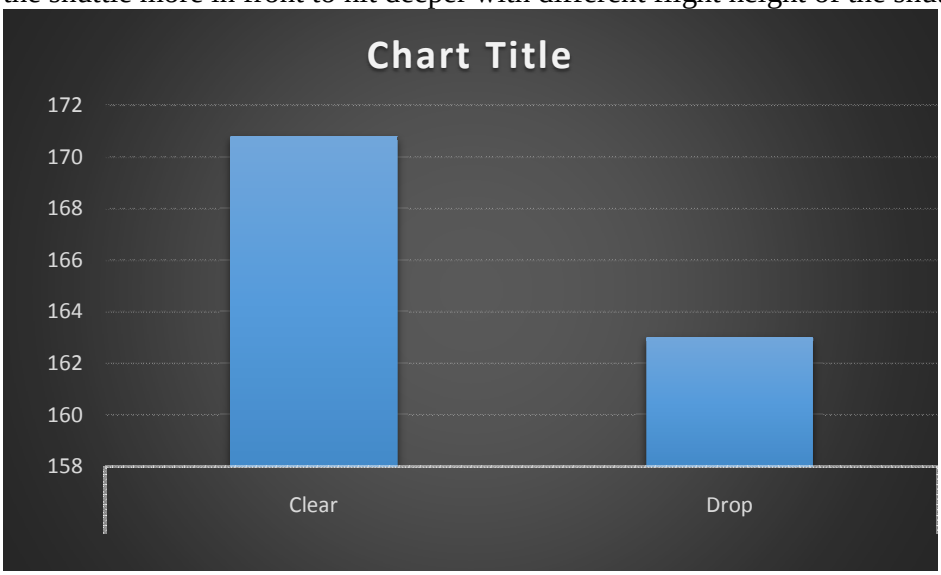

FIGURE-2
MEAN OF HIP ANGLE BETWEEN CLEAR AND SMASH

Discussion

The study used Independent-t test to compare the differences of Hip joint between Clear and drop shot. The comparison of selected kinematic variables, i.e. Hip angle had shown the significant difference between Clear and Drop in Badminton players. This significant difference may due to the pattern of technique of all players have their different performing technique but executing the Drop and clear more or less similar. Having smaller angle in drop shot can generate more range of motion show it may generate speed. The data collected within this study is not possible to investigate all the mechanism of hip joint during execution of clear and drop shot but should be looked at in further in details in the future investigation using the simulation technique.

Conclusion

Although there was a quite range of standard amongst the all players on selected hip joint of Clear and Drop. It sowed the significance where there is a difference of execution of Drop and clear shot in Badminton. Particularly having smaller angle in drop shot can generate more range of motion show it may generate speed. The data collected within this study is not possible to investigate all the mechanism of hip joint during execution of clear and drop shot but should be looked at in further in details in the future investigation using the simulation technique.

References

1. Kurdson, D., “Fundamental of Biomechanics.” United Kingdom: Plenum Publisher. (2003) pp.6
2. Hochmuth, G., “Biomechanics of athletic Movement.” Sportsverloug; Berlin (1984) p.9.
3. Brahm, et al., “Badminton hand book’’ Myer & Myer; UK (2010) pp.1-14.
4. Joseph Stiles Beggs (1983). Kinematics. Taylor & Francis. p. 1. ISBN 0-89116-355-7.
5. Thomas Wallace Wright (1896). Elements of Mechanics Including Kinematics, Kinetics and Statics. E and FN Spon. Chapter 1.
6. J. M. McCarthy and G. S. Soh, (2010), Geometric Design of Linkages, Springer, New York.
7. José M. Saavedra, Yolanda Escalante, Ferran A. Rodríguez (2010). A Multivariate Analysis of Performance in Young SwimmersVolume: 22 Issue: 1 Pages: 135-151
8. http://www.profedf.ufpr.br/rodackibiomecanica_arquivos/Books/Duane%20Knudson-%20Fundamentals%20of%20Biomechanics%202ed.pdf retrieved on 19/03/2016
9. https://isbweb.org/images/conf/2001/Longabstracts/PDF/0600_0699/0628.pdf(2001) /retrieved on 14/01/2016
10. http://www.authormapper.com/search.aspx?val=journal%3ASports+Engineering&coll=year%3A2013&size=50 / retrieved on 09/02/2016