

Role of Reaction Time Ability on Field Hockey Goalkeeper's At Different Levels of Sports Participation

Dr. Abhishek Kumar Singh

Department of Physical Education, Sri J.N.M.P.G. College, Lucknow, India

Email: abhisingh26@hotmail.com.

Abstract

The Purpose of the study was to compare, reaction time ability of male field Hockey Goalkeepers at different levels of sports participation. 45 male hockey goalkeepers aged between 18- 24 years were selected for the purpose of the study. Out of 45 subjects, 15 subjects each were selected from inter-collegiate; inter-university and National level Participation. All the selected subjects belong to U.P. state only. For the study reaction time ability was selected. Before the collection of data, through administering the tests, all the subjects were assembled and explained the purpose and procedure of the test item and given sufficient time for warm-up before testing. Adequate demonstrations with regard "Ball reaction exercise test" was performed on field. ANOVA (analysis of variance) technique was used to compare the mean of different levels of participation followed by LSD (least significant difference) wherever applicable and the significant difference was set at 0.05 levels. The Result of the study showed that a significant difference existed among senior national, inter- university and inter-collegiate level of field hockey goalkeepers in the variable of reaction time ability.

Keywords: Motor ability, field hockey, goalkeepers levels of sports participation

Field Hockey is undoubtedly one of the most popular and toughest sports in All over the world. There are different levels of hockey participations or tournaments in different countries, In India national level, state level, inter-university and district level and inter-collegiate hockey tournament are played. Research on performance of hockey usually focuses on players not on goalkeepers. This study attempts to understand aspects related to the optimization of Goalkeeper's resources and to classify their competition demands. Game situations allow coaches to identify some variables that can differentiate the best and worst goalkeepers and consequently lead to improve the results. A game of field hockey is won by outscoring the opposition. The goalkeeper forms the last line of defence for a team and their task is to intercept shots that are made from within a 14.6m radius from the goal.

Mohammad, (2012) the ball travel about 110 to 120 km/h to the goalkeeper and goalkeeper have less than one second to react to a shot from the edge of area and move to stop it. Reaction time of

Goal keeper affects the result of teams during the competition.

According to **Coach's Goaltending Handbook, (2012)** goalkeepers had several roles in their teams. Goalkeepers protect the goal and works as defensive coordinator. A goalkeeper needs to develop his physical and technical skills, focus and concentration, and their understanding of defensive tactics and strategy. Goalkeeper works on their physical and technical skills all the time.

Nelson & Johnson, (1970) the game demanded high level of motor fitness component. It includes several components such as speed, reaction time, endurance, flexibility, and these motor component helps in skill learning and, one will still be unable to perform well in a Goal- Keeping until he develops the specific skill related Goal- Keeping.

England hockey workshop, (2013) the physical elements that are of specific use to goalkeepers are the key dynamic flexibility elements, Foot speed, balance and agility (Co-ordinative ability) are crucial and very important for goalkeepers.

Very fewer studies have been conducted regarding the performance of Goalkeeper. Above literature shows a relationship between sports performance and reaction time ability of Goalkeepers, off-course it is new area of exploration, which will provide scientific knowledge to the students/ players/beginners/coaches who want to make their carrier in hockey, especially in goalkeeping, that’s why it was selected as problem to work.

2. METHOD AND MATERIRIAL

2.1 subjects

Forty five male hockey goalkeepers aged between 18- 24 years were selected for the purpose of the study. Out of forty five subjects, fifteen subjects each were selected from inter-collegiate; inter-university and national level participations. All the selected subjects belong to U.P. state only.

2.2 Selection of variable

For the purpose of study reaction time ability was selected as a variable.

2.3 Selection of test

As per available literature, the following standardized test item was used to collect data on the selected variable and variable was presented below-

2.3.1 Motor component

Variable	Test and Tool
Reaction Time ability	Ball reaction exercise test

2.4 Collection of data

Before the collection of data, through administering the test, all the subjects were assembled and explained the purpose and procedure of the test and given sufficient time for warm-up before testing. Adequate demonstrations with regard of Ball reaction exercise test was performed on field.

2.5 Statistical Procedure

To compare the selected reaction time ability of hockey goalkeepers, one way ANOVA (analysis of variance) technique was used to compare the mean of different levels of participation followed by LSD (least significant difference) wherever applicable. All statistical function SPSS v.16 software was used. The level of significant to determine the significant difference was set at 0.05 levels.

3. Result

Table 3.1:- Descriptive statistics of the variable of “Reaction time ability” at different levels of participation

Levels	N	Mean	SD
Senior National	15	147.33	8.42
Intervarsity	15	163.47	5.75
Intercollegiate	15	172.27	23.25

Table 3.2:- Analysis of variance (ANOVA) of the variable “Reaction time ability” among different levels of participation

	Sum of Squares	Df	Mean Square	F
Between Groups	4796.98	2	2398.49	11.19*
Within Groups	9036.00	42	215.14	
Total	13832.98	44		

*Significant at 0.05 level of significance

Tabulated F= 3.20

An examination of above cited Table 3.2, revealed that calculated F value (11.19) was found more than tabulated value of F (3.20) at 0.05 level of significance with 42 degree of freedom, hence there is significant difference existed among senior national, intervarsity and intercollegiate level of field hockey goalkeepers in the variable of reaction time ability.

To know the exact position of goalkeeper’s reaction time ability representing different levels of competition, least significant difference (L.S.D.) a post hoc test was applied and its result is presented in the following table 3.3.

Table 3.3:- Least Significant Difference (L.S.D.) of the variable “Reaction time ability” among different levels of participation

Senior National	Intervarsity	Intercollegiate	Mean Difference	Critical Difference
147.33	163.47		16.14*	10.81
147.33		172.27	24.94*	
	163.47	172.27	8.8	

The comparison of all three levels of competition was done using L.S.D. and its results

are presented in the above cited Table 3.3, it showed that significant differences were found between senior national and intervarsity; senior national and intercollegiate level field hockey goalkeepers, whereas no significant difference was documented between intervarsity and intercollegiate level field hockey goalkeepers in the variable of reaction time ability.

4. Discussion

The purpose of the study was to compare reaction time ability of hockey goalkeepers at different level of sports participation. The result of the study showed that a significant difference existed among senior national, inter-university and inter-collegiate level of field hockey goalkeepers in reaction time ability. **Dravin, Singh and Bangari, (2013)** also reported same type of results in their study; they worked on motor fitness and found significant difference among the subjects. They said that motor variables having a higher degree of associations with the level of performance, and this is also revealed by the findings of our study that higher-levels hockey goalkeepers possesses higher degree of reaction time ability when they were compared with their at lower levels of participation . This finding have also supported by **Uppal and Dutta (1980)**.

The comparison through L.S.D. among all three levels for the variable of reaction ability showed that differences were found between senior national and intervarsity; senior national and intercollegiate level field hockey goalkeepers, whereas no significant difference was documented between intervarsity and intercollegiate level field hockey goalkeepers, this finding have also been supported by **Erkut, Sirmen, Uzun, Ramazanoglu, Akan & Atil, (2009)**. **Keogh and Dalton (2003)** also reported that significant difference was documented with the varying standards of competitions.

5. Conclusions

- Significant differences existed in reaction time ability among senior national, inter-university and inter-collegiate level of field hockey goalkeepers.
- The comparison L.S.D. showed that significant differences were found in

reaction time ability between senior national and inter-university; senior national and inter-collegiate level field hockey goalkeepers, but no significant difference was documented between inter-university and inter-collegiate level field hockey goalkeepers.

On the whole it was attributed from the result of the study, that the field hockey goalkeepers of Uttar Pradesh state either, they were national or inter-university hockey goalkeepers having almost similar type of reaction time ability.

6. References

1. "England hockey workshop course content, course delegate and tutor pack". [www.sportplan.net/sp8/ngb/cha/13/goalkeeper manual](http://www.sportplan.net/sp8/ngb/cha/13/goalkeeper_manual). PDF, Retrieved date March 20th, 2013.
2. "The Coach's Goaltending Handbook" (2012). Available at [http://www.aldergoveminorhockey.com/images/pdf/coaches Goaltending Handbook, 2010.pdf](http://www.aldergoveminorhockey.com/images/pdf/coaches_Goaltending_Handbook_2010.pdf), Retrieved date October 29, 2012.
3. Burr, J. F., Jamnik, R. K., Baker, J., Macpherson, A., Gledhill, N., & McGuire, E.J. (2008). "Relationship of physical fitness test results and hockey playing potential in elite-level ice hockey players". *Journal of Strength Conditioning Research*. 22(5), 1535-1543.
4. Durdin, R. & O'Haire, J., (2000) "Goalkeeping in field hockey training, techniques, coaching and materials". O.B.O. Hockey, New Zealand.
5. Dravin, Singh, Y. & Bangari, D. (2013). Comparative investigation of anthropometric physical fitness and skill measurements of selected hockey players of Uttar Pradesh. *International Journal of Behavioral Social and Movement Sciences*, 2 (1), 118-122.
6. Erkut, A. O., Sirmen, B., Uzun, S., Ramazanoglu, N., Akan, D. & Atil, Z. (2009). Evaluation of body composition, muscle strength and balance in adolescents soccer players. *Book of Abstracts 14th Annual Congress of the European College of Sport Science, Norway*.
7. Harold, M. B. & Rosemary, M. (1979). "A practical approach to movements in physical education", Philadelphia: Lea and Febiger.

8. Hirtz, P., (1985). “**Co-ordinative fachigkeiten in school sports**”, Berlin. Volb & Wissen, Volloci, Verlong.
9. Keogh, J.W.L. & Weber, C.L. (2000). “Differences in physical characteristics and technical skill between female field hockey players”. Pre-Olympic Congress, Sports Medicine and Physical Education. **International Congress on Sports Sciences**, Brisbane Australia.
10. Khetmalis, M. S. (2012). “Comparison between selected coordinative abilities and motor abilities of female athletes of selected international Schools in Pune”. **Indian Journal of Movement Education and Exercises Sciences**, 2 (1).
11. Keogh, J. W. L., Weber, C. L. & Dalton, C. T. (2003). Evaluation of anthropometric, physiological, and skill-related tests for talent identification in female field hockey. *Canadian Journal of Applied Physiology*, 28(3), 397-409.
12. Lamba, M. K. (1980). “Comparative study of selected physical fitness components and physiological parameters of offensive and defensive hockey players of college level”. **Thesis**, Jiwaji University, Gwalior.
13. Lythe, J. & Kilding, A. E. (2011). “Physical demands and physiological responses during elite field hockey”. **International Journal of Sports Medicine**, 32 (7), 523-528.
14. Malhotra, M.S., Joseph, Mathur, D.N & Sengupta, (1973). “Physiological assessment of Indian hockey players”. **Sports Medicine Journal**, 2, 5.
15. Mitchell, C. & Tavener (2005). “**Field Hockey: Techniques and Tactics**”. Human Kinetics, U.S.
16. Mohammed, A. (2012). “Analysis of penalty corner of Indian team as compare to foreign counterparts in the field hockey: A Biomechanical study”. **Ph.D Thesis**, A.M.U.
17. Nelson, N. P. & Johnson, C. R. (1970). *Measurement and statistics in physical education*. Belmont, California, Wordsworth Publishing Company.
18. Reilly, T. (1996). “Fitness assessment”. In T., Reilly (Eds.), **Science and soccer** (pp. 25-50). E & FN Spon, U.K.
19. Uppal, A.K. & Datta, A.K. (1988). “Motor fitness components predictors of hockey performance”, **New Horizons of Human Movement, Seoul Olympic scientific Congress**, p. 58.
20. Wassmer, D.J., Mookerjee, S. (2002). “A descriptive profile of elite U.S. women’s collegiate field hockey players”. **Journal of Sports Medicine Physical Fitness**. 42(2), 165-171.
21. Yan, S., H., (2009). “The physical fitness profile of Hong Kong female soccer players”. **Thesis**, Physical Education and Recreation Management, Hong Kong Baptist University, Hong Kong.

ISSN 2349-638X

www.aiirjournal.com