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Distinguishing Playing Pattern between Winning and Losing Field Hockey Team in Delhi FIH Road to London 2012 Tournament

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***Abstract*—**The aim of the present study was to analyze and distinguish playing pattern between winning and losing field hockey team in Delhi 2012 tournament. The playing pattern is focus to the D penetration (right, center, left.) and to distinguish D penetration linking to end shot made from it. The data was recorded and analyzed using *Sportscode elite* computer software. 12 matches were analyzed from the tournament. Two groups of performance indicators are used to analyze, that is D penetration right, center, and left. The type of shot chosen is hit, push, flick, drag, drag flick, deflect sweep, deflect push, scoop, sweep, and reverse hit. This is to distinguish the pattern of play between winning and losing, only 2 performance indicator showed high significant differences from right ($Z=-2.87$, $p=.004$, $p<0.05$) and left penetration ($Z=-2.49$, $p=.013$, $p<0.05$). Winning team had higher significant in hit shot from right penetration ($Z=-2.719$, $p=.007$, $p<0.05$) same as left penetration showed high in push shot ($Z=-2.236$, $p=.025$, $p<0.05$) and hit ($Z=-1.983$, $p=.047$, $p<0.05$). The shots made from the center penetration had no significant between winning and losing team.

***Keywords*—**D penetration, field hockey playing pattern, goals scored.

I. Introduction

PERFORMANCE analysis has become an important role in giving feedbacks through videos and computerized software. The use of this knowledge gives important feedback to organizing team such as coaches and athletes. This type of study is considered as an observational study where by the need to observe players and to justify the problems through the use of match analysis and notational analysis.

Match analysis is the objective recording and examination of behavioral events that occur during competition [1]. The intention of match analysis is to identify and gathered all the information relating to positive and negative effects of performance in team and individual skills. Performance analysis has a number of applications including tactical and technical evaluation, analysis of movement and physical demands and development of predictive models [2].

Field Hockey nowadays has become a fast movement game that involves fast timing in the acquisition of passes and shots. Reference [3] explains that hockey has been classified as a goal-striking invasion game. A significant rule of hockey in that for a goal to be scored the ball must touch an attacking player's stick inside of the attacking circle (a 16 yard semi-circle around the goal) [4].

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The 16 yard semi-circle is also called as the D, the rules were in order to score a goal a player must be in the D area when making the shot. By this rules it is important to know or study which area in the D are most used. Does match analysis gives a great value to sporting organization? Reference [5] - [3] shows the study of sport through the observation of players' and teams' behavior is vitally important for the organization, design, teaching, and training of team sports.

The study of rugby in winning and losing team has been focused in one tournament and by gathering the high level team in the world. Reference [6] Study the differences in game statistics between winning and losing rugby teams in the Six Nations Tournament. The tournament here only consists of 6 teams. Reference [7] did on the rugby game-related statistics that discriminate between winning and losing teams in IRB and Super twelve close games.

This study gathered the teams from IRB and the super twelve close games. Reference [8] indicate that winning teams in world cup 1991 had a better performance in rucks than losing teams, but compared to [6] indicates that the foot game was used more by winning teams. References [9] did a study on game related statistics that discriminated winning, drawing and losing teams from the Spanish soccer league. Basically the indicators from each games analyzed change from time to time according to the present's style of play.

Performance analysis represents an important factor in delivering feedback through various ways that can effectively turn athletes to perform better results. Performance analysis also becomes an overall factor in developing and enhancing performance through match analysis such as strategies, playing pattern etc. Many coaches and sports organizations nowadays are extensively using performance analyst as a platform to enhance match play and strategies as well as to increase individual performance and understanding opponents' strengths and weakness by using all the related equipment such as video cam and computerized software. All combine to create a pool of information to be used by coaches with their players, to explore their own or their opponents' strengths and weaknesses in technique, tactics and movement [2]. The relationship between sports and technology nowadays are highly related to the contribution of post and concurrent feedback as most analyst are using software that is mostly used by professional teams in all sports, such as Sportscode, Prozone, Dart fish to analyze the matches. One of the software that is used in analyzing a game is Sportscode that is divided into Gamebreaker, Pro & Elite. Today the use of this software can be analyze while the match is running to enable direct feedback such as game play, strategies, weaknesses, advantages and even individual physical performance. Until now however, the use of this technology is still unclear on the efficiency of establishing data on reliability, validity and practicality.

Hockey is a sport that shares many tactical and structural similarities with soccer [4]. However, Reference [4] shows the volume and quality of research investigating various aspects of performance in hockey is limited. The research by [4] was to investigate the physical and technical demands of elite men's hockey.

Reference [10] did a notational analysis on women's field hockey base on the goal scored from open play in the international league such as, Olympic Qualifying Tournament 2000, the Olympic Games 2000 and Commonwealth Games 2002. The aim was to investigate how goals are scored in current international women's field hockey.

The results showed that shots are coming from the right hand side which led a score at the bottom left-hand side of the goal. It's interesting to know that the penetration comes from the right hand side as mostly the players are attacking right handed. From this evaluation the coach or athletes can make changes to team tactical and strategies if were to stop balls losing at the same place.

The aim of the present study is to identify and distinguish the playing pattern that is concentrating on D penetration and the end shot made through the penetration between winning and losing team in Delhi FIH Road to London 2012 Tournament.

II. Method

The data was gathered from the Olympic qualifying round road to London in Delhi 2012 (n =12 games) but only 10 matches were taken due to 2 match was drawn. The variable was collected using computerized software, *Sportscode elite* (Sportstec Australia).

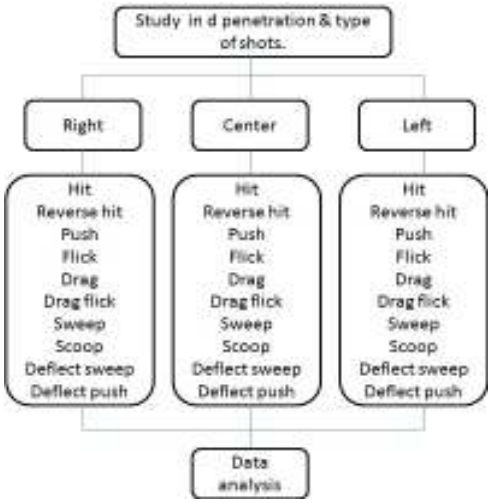

Fig. 1 Study variables

III. Procedure

The variables were divided into two groups (Table 1). The following are related statistics gathered: D penetration (right, Center, left), types of shot (hit, flick, scoop, sweep, push, reverse hit, and deflection).

TABLE I
VARIABLES STUDIED IN THE OLYMPIC QUALIFYING DELHI 2012

No.	Group of variables	Performance indicators
1	D penetration	Right penetration, center penetration. & left penetration
2	Types of shots	Hit, flick, drag, drag flick, scoop, sweep, push, reverse hit, and deflect sweep, deflect push.

IV. Data Analysis

All the data gathered was transfer to statistical program analysis version 17.0 (SPSS17.0). All the data is based on descriptive analysis and the statistical value is set at $p \leq 0.05$. Descriptive analysis was done to show the mean ± standard deviation between both winners and losers.

V. Results

TABLE II
DIFFERENCES IN D PENETRATION BETWEEN WINNING AND LOSING TEAMS IN OLYMPIC QUALIFYING DELHI 2012

D penetration	Winners		Losers		
	Mean	SD	Mean	SD	p value
Right	16.75	7.412	6.58	4.6	.004
Center	4.83	2.623	3.08	1.929	.129
Left	10.42	3.801	5.33	2.807	.013

The results of D penetration mean ± standard deviation are demonstrated in Table II. The data then were analyze using Wilcoxon matched pairs singed rank test to determine the differences between both winning and losing team with p value set at $p<0.05$.

The first group of variables from D penetration, 2 performance indicators show a significant different from winning and losing team which is penetrated from the right ($Z=-2.87$, $p=.004$, $p<0.05$) and penetrated from left ($Z=-2.49$, $p=.013$, $p<0.05$). However, penetration from center D did not show any significant different between winning and losing team ($Z=-1.57$, $p=.129$, $p<0.05$).

TABLE III
TYPES OF SHOT IN D PENETRATION

Right	Winners		Losers		
Types of shot	Mean	SD	Mean	SD	P value
Hit	1.58	1.165	.33	.492	.007
Reverse hit	.42	.515	.42	.900	.705
Push	0.5	.798	.00	.000	.063
Flick	1.08	2.875	.08	.289	.197
Drag	.00	.000	.00	.000	1.000
Drag flick	.08	.289	.00	.000	.317
Sweep	.42	.515	.17	.389	.257
Scoop	.17	.577	.08	.289	.655
Deflect sweep	.08	.289	.00	.000	.317

Deflect push	.08	.289	0.25	.622	.414

Center	Winners		Losers		
Types of shot	Mean	SD	Mean	SD	P value
Hit	.5	.674	.25	.452	.317
Reverse hit	.25	.622	.00	.000	.180
Push	.42	.515	.25	.452	.414
Flick	.25	.622	.00	.000	.180
Drag	.08	.289	.00	.000	.317
Drag flick	.00	.000	.00	.000	1.000
Sweep	.25	.622	.08	.289	.414
Scoop	.17	.389	.00	.000	.157
Deflect sweep	.00	.000	.00	.000	1.000
Deflect push	.08	.289	.08	.289	1.000

Left	Winners		Losers		
Types of shot	Mean	SD	Mean	SD	P value
Hit	1.08	1.084	0.33	0.492	.047
Reverse hit	.17	.389	0.08	0.289	.564
Push	.58	.9	0.17	0.577	.025
Flick	.08	.289	.00	.000	.317
Drag	.08	.289	.00	.000	.317
Drag flick	.00	.000	.00	.000	1.000
Sweep	.17	.389	.00	.000	.157
Scoop	.17	.389	.00	.000	.157
Deflect sweep	.00	.000	.00	.000	1.000
Deflect push	.17	.389	.00	.000	.157

The second groups of variables are the types of shot that is shown in Table III. Winning and losing team is highly distinguish by hit shot penetrated from right side ($Z=-2.719$, $p=.007$, $p<0.05$), the other shots from right penetration did not show any significant that is reverse hit ($Z=-.378$, $p=.705$, $p<0.05$) push ($Z=-1.857$, $p=.063$, $p<0.05$), flick ($Z=-1.289$, $p=.197$, $p<0.05$), drag ($Z=-.000$, $p=1.000$, $p<0.05$), drag flick ($Z=-1.000$, $p=.317$, $p<0.05$), sweep ($Z=-1.134$, $p=.257$, $p<0.05$), scoop ($Z=-.447$, $p=.655$, $p<0.05$), deflect sweep ($Z=-1.000$, $p=.317$, $p<0.05$)and deflect push ($Z=-.816$, $p=.414$, $p<0.05$). The center penetration shows no significant distinguish between winning and losing with hit ($Z=-1.000$, $p=.317$, $p<0.05$, reverse hit ($Z=-1.342$, $p=.180$, $p<0.05$), push ($Z=-.816$, $p=.414$, $p<0.05$) flick ($Z=-1.342$, $p=.180$, $p<0.05$), drag ($Z=-1.000$, $p=.317$, $p<0.05$), drag flick ($Z=-.000$, $p=1.000$, $p<0.05$), sweep ($Z=-.816$, $p=.414$, $p<0.05$), scoop ($Z=-1.414$, $p=.157$, $p<0.05$), deflect sweep ($Z=-.000$, $p=1.000$, $p<0.05$), and deflect push ($Z=-.000$, $p=1.000$, $p<0.05$). The left penetration showed high in push shot ($Z=-2.236$, $p=.025$, $p<0.05$) and hit ($Z=-1.983$, $p=.047$, $p<0.05$). The other shot did not show big different, these are reverse hit ($Z=-.577$, $p=.564$, $p<0.05$), flick ($Z=-1.000$, $p=.317$, $p<0.05$), drag ($Z=-1.000$, $p=.317$, $p<0.05$), drag flick ($Z=-.000$, $p=1.000$, $p<0.05$), sweep ($Z=-1.414$, $p=.157$, $p<0.05$), scoop ($Z=-1.414$, $p=.157$, $p<0.05$), deflect sweep ($Z=-.000$, $p=1.000$, $p<0.05$), and deflect push ($Z=-1.414$, $p=.157$, $p<0.05$).

VI. Discussion

The aim of this study was to distinguish the playing pattern between winning and losing team in Olympic qualifying round Delhi 2012.

The playing pattern was specifically chosen towards D penetration (right, center, left) and types of shot linking to the penetration. Through the analysis of d penetration (right, center, left) there were significant different distinguished between winning and losing penetration from the right and left side. The right penetration showed the highest result, this is probably because most of the players are right hand attack, but this would be subjected for further research in order to determine the dominant side of the players. Center penetration showed no significant between both winning and losing team. This may suggest that winning team had a better control of the d penetration especially from the right side. On the left penetration it shows a slight difference in frequencies penetrated to the right side this would be to become as the second choice of penetrating through instead of the right side. This can be due to the end result after penetrate weather it could be a pass or direct shot to the goal, apparently this becomes quite difficult if a right hand attacker were to perform a shot. The position of the player can effect on the types of shot chosen then on. But this would be a different matter and requires further research.

The results on types of shot from d penetration shows that winning team had a high significant different in the hit shot resulting from the right penetration. Also the push and hit from the left penetration showed significant different that distinguish from other shots and penetration. The study from [10] showed a same pattern penetrated from the right side with the ending hit shot. It is interesting to know that most goals are scored from hit shot ending down the left bottom goal. The hit shot is striking the ball using a swinging arm action movement of the stroke towards the ball, usually the hit shot involves power and produces speed to the ball velocity which gives a big deal for the keeper to see the ball clearly with the attempt to save the shot. However this suggestion is subjected for further study.

The push shot becomes one of the most used shots in the tournament especially the winning team. The push shot is when moving the ball along the ground by using a pushing movement of the stick, both the head of the stick and the ball are usually in contact with the ground during the pushing movement. The push shot can be execute from direct shot, pass and deflect. Push shots are usually score in close range which means the losing teams are easily scored from push shot that happens near to the goal. For defense wise the loser's team supposed to improve the blocking of close range shot in order to stop goals from coming to that specific area.

VII. Conclusion

From this study we can conclude that most favorable area shows on the right penetration of the D. For the type of shots it seems that hit and push shot coming from right and left is the most popular choice shot and area penetrated for the winning team. Coaches can use this result to form other objectives to support on developing the training plan for team and individuals characteristics that suits this type of game play.

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REFERENCES

[1] C. Carling, A. Williams and T. Reilly, "The handbook of soccer match analysis" London: Routledge, 2005
[2] M. D. Hughes, "Performance analysis- a 2004 perspective" International journal of performance analysis in sport, 2004, 4, 103-109.
[3] M. Hughes, and R. Barlett, "The use of performance indicators in performance analysis" Journal of sports science, 2002, 20, 739-754.
[4] J. Lythe, "The physical demands of elite men's field hockey and the effect of differing substation methods on physical and technical outputs of strikers during match play." Auckland University of Technology, school of sport and recreation, 2008.
[5] M. Hughes and I.M. Franks, "Notational analysis of sport. System for better coaching and performance in sport." London: Ed. Routledge, 2004.
[6] E. Ortega, D. Villarejo, and J.M. Palao "Differences in game statistics between winning and losing rugby teams in six nation tournament" Journal of sports science and medicine, 2009, 8, 523-527.
[7] L. Vaz, M. V. Rooyen, and J. sampaio, "Rugby game-related statistics that discriminate between winning and losing teams in IRB and super twelve close games" Journal of sport science and medicine, 2010, 9, 51-55.
[8] J. Standhope, and M.D. Hughes, "An analysis of scoring in the 1991 rugby union world cup" Notational analysis of sports III. Cardiff. Iwic. Eds: Highes, M.D. and Franks I. 58-74.
[9] L.P. Carlos, L. B. Joaquin, D. Alexandre, and G. Maite, « Game-related statistics that discriminated winning, drawing and losing teams from Spanish soccer league" Journal of sport science and medicine, 2010, 9, 288-293.
[10] C. Sunderland, C. Bussell, G. Akitson, M. Kate, and R. Alltree, "Notational analysis of goals scored from open play in international field hockey" Journal of sport science, 2005, 23, 1300-1301.

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