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Comparison of Technical and Tactical Factors Related to Top Four Youth Handball Team with Iran Youth National Team in 2011 World Handball Championship in Greece

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ABSTRACT

This study aimed at comparing the technical and tactical elements of top four youth handball teams with Iran national youth team in 2011 World Handball Championship in Greece. In this research, four higher handball youth teams of the world including Germany, Denmark, Tunisia, and Egypt, respectively compared with Iran national youth team, placed in twelfth place of the tournament, in terms of technical and tactical factors. This comparison was done drawing upon the comprehensive statistics about the tournament games provided by the World Federation and the host country. The results indicate that among the 24 effective factors of handball between top four teams and Iran, the difference in these factors including (field shots, line shots, breakthroughs, 7m throw, fast breaks, opponent's suspension and two-minute suspension, first half scored goals, second half scored goals, total scored goals of two halves, receiving field shots, line shots, wing shot, breakthroughs, and the total receiving shots) were not significant. However, some factors including (assist pass, error pass, wing shot, total goals out of shots, first half received goals, second half received goals, total received goals in two halves, receiving ball in fast break and 7m throw by the goalkeeper) were significant and resulted in the superiority of these four teams. Therefore, it seems that it is necessary to allocate more time, energy, and attention to Iran team in order to eliminate the imperfections and technical and tactical shortcoming of this team to achieve better results in future years.

Key words: Handball trainings, Tactic, Technique

Introduction

When you plan for a trip, you need to know where you are, where you wish to go, and how to get there. Similarly, when you design the sports schedule, evaluation of the players and the team helps you know where you are and identification of the purposes determines where you want to go and analysis of the needs specifies the path (Sharkey, B.J.E. Gaskill, 2008). Definitely, if the coach fails to employ the planning and scientific rules of training, he can predict the aims and future of the team and the players with less plausibility and nowadays it is not reasonable to rely on the trial and error (Alijani, E., 2008). Regardless the principles of exercise science, each sports field holds proper and standard techniques that the coach and the players should follow them. In fact, technique consists of all the structures and technical factors involved in a precise and effective movement that the athlete should perform in the field (Bompa, T.O., 2010). However, tactic of each sports field is considered as the tools for athletes to learn the possible methods and procedures to prepare and organize the attack and defense moves to gain access to desirable target (Bompa, T.O., 2009). The basis of successful tactical plan for each sport is holding a high technical level. Furthermore, tactical skill is one of the factors determining success in team fields, because in conditions that the techniques are equal, the winner is one who employs more precise and reasonable tactics (Bompa, T.O., 2010). Handball is one of the main events of Olympic Games and its related World Championship games are held at various ages (Aghaalienejad, H., E Ghahremanloo, 2007). Team attack of this field starts from a 3-3 basic arrangement in which the players appear in situations according to their abilities and skills. This arrangement provides balance and order, but it does not prevent the players from creativity and freedom. The 3-3 arrangement is common for tactical movement, because it gives equal spaces of players in back of the court and the possibility of short passing and better ball control (Clanton, R., 2005). In this sport, six attack players try to move the ball with passing and shoot into a guarded goal. In other words, players in attack work closely together as a group to organize shooting to the goal (Amirtash, A.M., 2006). Due to this fact, the technique of passing and catching the ball is the starting and basic point of handball. Drawing upon these techniques results in sustained attack and increased pressure on the opponent's defenders

and consequently increases the chances of scoring the goal. Of course, the final and main objective of attack is scoring, so in handball the shooting technique is the final act in attack to earn points. Meanwhile, firm shoot is not enough to defeat a skilled goalkeeper, it is necessary to shoot accurately. Shooting with technique and precision form various posts provides the opportunity for scoring opportunities to earn point. However, if the offensive team loses the possession of ball because of shooting with low precision, error pass or violation of the rule, it should turn the game quickly to the defense position and try to delay starting the other team's attack to prevent from their fast break. To avoid this situation, all defending players should return to 6 m line and do the organized defense there. Indeed, the team success mostly depends upon the ability of not receiving the goal (Clanton, R., 2005). Besides, goalkeeper is the last line of defense. If the shot passes from the defenders, a goalkeeper is there to be a barrier against the ball.

When the attacking player shoots, the goalkeeper moves to attack the ball and divert it with part of his body in order to stop the ball entering the goal (Amirtash, A.M., 2006). The goalkeeper encounters the shots at a speed of 80 miles (128 kilometers an hour). Among the features of handball are goalkeeper spectacular ball handling, contact and physical clash in 6m and 9m lines, dive shots of wing and pivot, field players' jump shot over the defenders, the speed of the game which is more than most of the ball and field games (Amirtash, A.M., 2006). Hence, in order to succeed in such factors, the players need not only to learn in which positions they should implement these techniques and tactics, they also need to know the right time to implement them. Acting one minute early or late results in missing the opportunity. Therefore, choosing the type of technique and tactic by the back and forth players can determine the result of the game. In doing so, the main question is that with respect to the fact that Iran handball youth national team has attended in 2011 World Handball Championship in Greece and has won the twelfth position, at what level is Iran team in terms of the players' technique (pass and shots of the players in different posts and handling the ball by the goalkeeper) and team tactics in defense and attack (scored and received goals in first and second half and the total halves)? Is there any significant difference between the statistics of technical and tactical factors of Iran and top four teams? If this difference is significant, what need to be done to remove this difference and reach the world top four teams in the future? In other words, which technical and tactical factors of Iran team need to be strengthen and more time be devoted to them?

Materials And Methods

In current study, the library and documentary method have been utilized. The related information gathered from the data and comprehensive statistics recorded in the official websites of World Federation and handball competitions. The sample population of this study included all the teams reached 2011 World Handball Championship in Greece. The first considered group was the top four teams (Germany, Denmark, Tunisia, and Egypt), and the second group was Iran handball youth national team placed in twelfth position. The groups were selected through non-random sampling method after finishing the tournament and compared. In order to analyze data related to comparing the players' performance, in case that data were in frequency form, the one-way chi-square was employed and in cases that data were as proportion and the purpose was to compare two independent proportions, a test of independent proportions was used $Z = \frac{P1 - P2}{\sqrt{pq(\frac{1}{n1} + \frac{1}{n2})}}$ (Delavar, A., 2009).

Results:

The research hypothesis was that the frequencies and proportions related to technical and tactical factors of top four teams are higher than those of Iran team. Testing research hypotheses demonstrated that:

1-The handball players of world top four youth teams possessed higher technical skill to make assist passes than the players of Iran national youth team. Furthermore, the frequency of error passes of top four teams' players was lower than those of Iran team (Table 1).

2- The differences between the technical skill of field shots, line shots, breakthroughs, 7m throws, fast breaks, and the total shots and goals of the players of top four teams and Iran team were not significant. Moreover, there was no meaningful difference between the wing shots of top four teams and Iran (Table 2).

3-The difference between the number of the opponent's 2 suspensions and the received 2 suspensions in top four teams and Iran team was not significance (Table 3).

4-The tactical frequency of received goals of first half, second half, and total halves of top four teams was lower than Iran's. Besides, this difference between frequencies was statistically significant. However, the tactical frequency of the scored goals of first half, second half, and total halves of top four teams was approximately equivalent to Iran's and the difference between the observed frequencies was not statistically significant (Table 4).

5-The numbers of received shots including field, line, wing shots, and breakthroughs of top four teams' goalkeepers were not statistically different from those of Iran goalkeepers. Nevertheless, significant difference

was found between the number of saved shots of the goalkeepers of top four teams in fast breaks and 7m throws and those of goalkeepers of Iran youth handball team (Table 5).

Table 1: Chi-square results to compare passing technique of two teams

Statistical index Teams	Index	Observed frequency		Expected frequency	Remaining	(x^2)	df	Sig.
		Frequency	Percentage					
Four teams	Assist pass	105	58.0	90/5	14/5	4/64	1	0/031
Iran		76	42.0	90/5	-14/5			
Four teams	Error pass	102	43.6	117.0	-15.0	3/84	1	0/05
Iran		132	56.4	117.0	-15.0			

Table 2: Findings of two independent proportions test to compare two groups in terms of shooting technique of two teams

Groups	Index	F	N	P	Total ratio $P = \left(\frac{f1 + f2}{n1 + n2} \right)$	$P_1 - P_2$	Z	Sig.
Four teams	Field shots	77	176	43/7	0/41	0/04	0/83	0/203
Iran		96	242	39/66				
Four teams	Line shots	60	88	68/18	0/69	-0/023	-0/34	0/36
Iran		74	105	70/47				
Four teams	Wing shots	34	55	61/81	0/54	0/17	1/64	0/05
Iran		18	40	45				
Four teams	Breakthroughs	33	50	66	0/71	-0/11	-1/21	0/113
Iran		34	44	77/27				
Four teams	7m throw	16	20	80	0/70	0/16	1/18	0/119
Iran		18	28	64/28				
Four teams	Fast breaks	46	61	75/4	0/75	0/016	0/18	0/42
Iran		31	42	73/81				
Four teams	Shots and goals	267	454	58/81	0/56	0/04	1/38	0/08
Iran		278	511	54/4				

Note: F, frequency; N, number; P, percentage

Table 3: Chi-square results to compare two teams' technical skill of 2-minutes suspension

Statistical index Teams	Index	Observed frequency		Expected frequency	Remaining	(x^2)	df	Sig.
		Frequency	Percentage					
Four teams	Opponent's suspension	31	47.0	33.0	-2.0	0/242	1	0/622
Iran		35	53.0	33.0	2.0			
Four teams	2 Minute Suspensions	31	44.3	35.0	-4.0	0.914	1	0.339
Iran		39	55.7	35.0	4.0			

Table 4: Chi-square results to compare tactical performance of two teams in terms of received and scored goals

Statistical index Teams	Index	Observed frequency		Expected frequency	Remaining	(x^2)	df	Sig.
		Frequency	Percentage					
Four teams	First half received goals	109	41.9	130	-21.0	6/78	1	0/009
Iran		151	58.1	130	21.0			
Four teams	First half scored goals	133	48.0	138.5	-5.5	0/437	1	0/509
Iran		144	52.0	138.5	5.5			
Four teams	Second half received goals	105	41.0	128	-23.0	8/26	1	0/004
Iran		151	59.0	128	23.0			
Four teams	Second half scored goals	134	50.0	134	0	0/999	1	0/999
Iran		134	50.0	134	0			
Four teams	Total received goals	215	41.6	258.5	-43.5	14/64	1	0/0001
Iran		302	58.4	258.5	43.5			
Four teams	Total scored goals	267	49.0	272.5	-5.5	0/222	1	0/638
Iran		278	51.0	272.5	5.5			

Discussion and Conclusion:

As research findings indicate, the players of top four handball teams had higher technical skills regarding assist pass than Iran team. Moreover, the frequency of technical skills of error pass of top four teams' players was lower than Iran's. With respect to the fact that, passing is a basic and principal technique in handball and most of the errors in passing and receiving the pass are due to lack of appropriate application of technique and incorrect estimate of speed; hence, the player may fail to recognize accurately the speed and direction of teammate and ball (Clanton, R., 2005). Besides, passing results in continuing attack and increasing pressure on opposing defenders which ultimately increases scoring opportunities. It can be concluded that passing is an important skill that makes difference among creative, inventive, and alert players and other members of the team. In addition, by not giving the ball to the other team, the opponent's scoring opportunities decrease which leads to their own winning.

Table 5: Findings of test of two independent proportions to compare two groups in terms of goalkeepers' performances

Groups	Index	F	N	P	Total ratio $P = \left(\frac{f1 + f2}{n1 + n2} \right)$	P ₁ -P ₂	Z	Sig.
Four teams	Receiving field shots	60	119	50/42	0/48	0/045	0/64	0/261
Iran		39	85	45/88				
Four teams	Receiving line shots	26	69	37/68	0/33	0/07	0/94	0/173
Iran		34	110	30/9				
Four teams	Receiving wing shots	20	49	40/8	0/37	0/05	0/65	0/257
Iran		31	88	35/22				
Four teams	Receiving fast breaks	10	41	24/39	0/15	0/14	2/02	0/02
Iran		6	62	9/67				
Four teams	Receiving breakthroughs	10	41	24/39	0/2	0/07	0/83	0/203
Iran		10	57	17/54				
Four teams	Receiving 7m throw	7	25	28	0/20	0/18	1/50	0/06
Iran		2	20	10				
Four teams	Total received shots	133	384	34/63	0/33	0/094	2/77	0/003
Iran		122	424	28/77				

Note: F, frequency; N, number; P, percentage

Given the fact that technique implementation is not restricted to ideal conditions, the nature of technique should be developed in the way that the player can adjust his performance to the complex competitive conditions (Bompa, T.O., 2009) to be able to increase pressure on opposing defenders through passing from one player to another. It seems that Iran handball players need to adapt the technical models to the game conditions, because rhythm, features, and competition intensity change with the opponent fitness level and environmental conditions. Of course, it is recommended that the general principles of individual trainings of players be divided from easy to hard and in four stages, each with its own specific features: 1) to amend weaknesses of individual techniques which have been appeared during the game or pay attention to basic skills in normal situation, such as exercising passing in standing position and without the presence of defender, 2) to complete basic techniques and skills of the players in normal position such as exercising passing in moving position and in the presence of defender, 3) to create and establish different skills in different and changing situations of the game at the level which people can employ their ingenuity depending upon the game opportunities to choose the appropriate method with their technical knowledge and capabilities and perform at best such as selecting the best kind of pass with respect to the conditions and opportunities of the game, 4) to promote the necessary physical fitness skills to complete the previous stages so as to attend different championship games and succeed in them (Amirtash, A.M., 1995).

Other findings of research revealed that there are not significant differences between top four teams and Iran in terms of technical skills such as field shots, line shots, breakthroughs, 7m throws, fast breaks, and the total shots and goals, because according to the statistics presented by World Federation, the best scorer and the second best field player of this tournament were from Iran (<http://www.XVIII MENS JUNIOR WORLD CHAMPIONSHIP 2011 GREECE.com>). However, it is obvious that the ability to score from the field has direct relationship with the quality of attack (Clanton, R., 2005), since shooting from the field makes the defender to recede from the goal area, i.e. to far 6 meters. This leads to increasing defensive depth and creates open spaces for the wing and pivot players. Therefore, considering the age level of games which constitutes youth, it is recommended that technical and tactical training be adopted to increase the accuracy of technique of these shots in different zones. As after much practice of a particular move, much details of the move can be called from the cerebellum and need less motor cortex. This is the less need of conscious effort in implementing a particular move. It means that the player can concentrate on the other parts of skill implementation including tactics, group work, or the ability of predicting next events (Robergs, R.A.,). Hence, all these factors cause that the players dominate their opponents and result in winning the game. Besides, it is suggested that more attention be drawn upon findings talents in physical, technical, and tactical dimensions. Since, the height of player is effective for the back players to shoot over the defenders and also technical and tactical players mostly embark on attacks and their play has considerable influence on team efficiency.

Other notable findings of the study demonstrated that there is meaningful difference between top four teams and Iran with respect to the technique of wing shots. In other words, Iran players were lower than top four teams in terms of frequency of throwing the ball and gaining results with 15 and 16 differences, respectively. This statistics can be explained that the wings have not been fed well by the back players, i.e. field players, as well as inaccuracy of shooting of wings. Considering the fact that learning shot technically and accurately causes that scoring opportunities with less likely become excellent opportunities; therefore, the wing increases the effect of attack and scoring potential with useful utilization of across all the court. Moreover, this technique can create gaps in defensive line and improve the effectiveness of attack. Since the wing can draw the attention of some defenders and disrupt the defense; hence, field players and pivots find more spaces to maneuver and shoot. Consequently, threatening the goal from each area of the court always raises the effect of attack on defense

(Clanton, R., 2005). As a result, it is suggested that appropriate technical and tactical training be considered to enhance the shooting and passing capabilities of wings and backs. Of course, by reinforcing the shooting technique of wings, Iran team can have more powerful attack. Due to the potential of Iran players in breakthrough, they throw the opponent's defenders into confusion which results in the opponent two-minute suspension and 7m throw. The higher frequencies of these two indices for Iran players, i.e. two-minute suspension and 7m throw than top four teams confirm this matter.

The other results of the study illustrate that the difference between the frequency of receiving 2-minute suspension from the opponent in top four teams and Iran was not significant. Nevertheless, the lower frequency of these suspensions in top four teams than Iran indicates that Iran players had higher capabilities in receiving these errors from their opponents. This can be effective for team attack, because it makes the opponent for two minutes to be present in the court with one less player. The continuing shortage of players in the court causes additional pressures on other players and they become exhausted and ultimately lose the game. In order to take the best advantage of this opportunity, it is suggested that attack tactic be performed with more players as follows: 1) The game be done within across the court so as to use more spaces of the court, 2) Careful tactics be employed which have been trained before, 3) The players should do their best to shoot in areas close to the goal, 4) The simplest tactic be implemented which leads to success, 5) The players need to refuse hurried attacks and early shots, 6) During attack, the players should consider the moves of the opponent's players, 7) The players should try to reduce the team stress as much as possible, since the team that is superior in terms of number of players is under pressure by spectators, team officials, and coaches. These pressures and expectations often results in overhastiness of the players and consequently losing the opportunity. Due to psychological issue, the team loses many opportunities which leads to loss of harmony and creates team tension. Finally, consecutive failures and tensions which are affected by overhastiness and lack of plan, despite the advantages in terms of number of players, cause disturbance in team tactic. Following strategies are recommended for tactical management of time while the team is in defense situation: 1) The defenders should apply pressure on opponent team through performing invasive defense to cause the opponent's inaccurate passes, 2) They should predict the opponent moves exactly, 3) They should employ man to man defense, 4) It is a good opportunity to cut opponent's passes and so use fast break, 5) A good situation arises to change defense tactics, 6) The team should do delaying tactics in defense to waste the time (Pourkiani, M., *et al.*, 2010).

Current research also revealed that the difference between top four teams and Iran was not meaningful with respect to two-minute suspension. However, given the fact that Iran and top four teams experienced this 39 times and 31 times in nine games, respectively, there should be an attempt to improve this defense technique in Iran, since by dominating on individual defense techniques, it ensures the defense capabilities in neutralizing the opponent's attack and shows the team cooperation during defense (Clanton, R., 2005). Accordingly, it is recommended that following points be considered during defense with less players. 1) More focus on defense against the balls played in wing. 2) More coherent support from teammates. 3) Defense states and positions should be designed on the basis of their own and the other team weaknesses and strengths. 4) Effort to disrupt the tactical structure of opponent (Pourkiani, M., *et al.*, 2010).

Three other findings of study demonstrate that the frequency of tactical performance of received goals of first half, second half, and two halves of top four teams were lower than those of Iran. This difference was statistically significant. In other words, in first half top four teams received goals every 148 seconds and in second half every 154 seconds. On the other side, in first and second half, Iran received goal every 107 seconds. However, top four teams received goals in second half in greater interval which seems that physical fitness of top four teams has contributed to this matter, because tactical defense training is a function of technical defense training and appropriate physical fitness of the players. Therefore, physical and technical improvements are necessary for new tactical trainings (Bompa, T.O., 2009). Although attack looks more spectacular than defense, they do not have any difference in team success in terms of necessity and importance. In fact, team success depends more on the ability of not receiving the goal, because while scoring is important, if for any scored goal, the team receives a goal, nothing has indeed obtained. Definitely, effective defense relies on the dominance of each player on individual techniques and tactics. But success depends on how to make the players' techniques and responsibilities coherent, because handball is a contact sport that requires individual defense desire (Clanton, R., 2005). It is therefore proposed that an emphasis be put upon individual defense training separately and different steps of tactical defense be implemented as follows: A) Defensive balance: in high level teams, the defense is begun simultaneous the attack by the opponent team. While moderate level team returns to his area quickly to defend after losing the ball. In fact, in strong teams as soon as the team stands in defense state, all players prepare automatically themselves mentally and physically to predict the opponent's moves and outdo them. This defensive balance reveals various qualities depending upon different attack steps from catching the ball, developing attack organization, and then final step of shooting to goal; hence, at each opportunity, the defenders try with maximum players to block the opponent's players well from the farthest attack players to the closest players at the 9m area depending on game conditions and place of the ball. This defensive balance indeed includes three purposes: 1) The defense be established in such a manner that an attack can be structured

as soon as the ball caught. 2) The team transformation from attack mode to defense mode, i.e. speed in changing and transforming attack structure to defense, because devoting time to training transforming attack to defense creates confidence in defense and increases power dimension of team attack (Clanton, R., 2005). 3) Making temporary defense so as all the team players return to their own defense position. B) Defense against fast break: this kind of defense starts from affecting the goalkeeper throwing the fast break ball and while retreating, the players try to reduce the speed of the ball to their goals as much as possible. Therefore, the main principle that needs to be observed in this situation is that for quick retreatment, the defenders during defense should not back the ball and the attack players, but from that moment they should perform the first action to defense and retreatment at the same time. Perhaps in this situation because of the hastiness of the offensive team, they could catch the ball and in fact respond fast break with fast break. Otherwise, one or two players prevent the ball from advancing so that other players make the required defense organization. C) Final step of defense in goal line: with regard to the fact that the final aim of defense is to stop the attack and receive the ball and organize a fast break; hence, two kinds of defense are performed: 1) Active, energetic defense in which the players are engaged in defense and attack continuously to catch the ball. 2) The defense in which the players defend with more confidence and wait to catch the ball because of mistake of the offensive team (Amirtash, A.M., 1995). On this basis, the defending team prevents from receiving the goal or receiving the goal easily and with low-energy and the opponent need to score the goal with most hardship and energy.

The other three results of research were as follows: the frequencies of tactical performance of scored goal of first half, second half, total have related to top four teams were approximately equal to Iran's and the observed differences were not statistically significant. In other words, in first half, top four teams scored a goal every 121 seconds and Iran had a goal every 112 seconds and every 120 seconds in second half. With regard to this data, Iran in the first half achieved scored in less time interval and was more successful in scoring, but because of the fragile defense of Iran, this high number of scored goal did not lead to achieving desired results. In this condition, the importance of a strong defense becomes more tangible. In addition to defense techniques, an attention should be paid to attack, because the team needs to score goals to compensate the received goals to prevent from team failure. Accordingly, it is recommended that a program be developed for Iran team to have more opportunities to repeat attack techniques. In order to keep the scored goals, it is recommended that preparatory games with powerful teams be planned and the players of Iran youth national team be included in teams of local handball league so that they can employ the obtained opportunities of playing in local league teams during a season to develop their motor-attack skills with high repetitions and playing in natural conditions, because skill acquisition originates from repetition which Thorndike states it as "Law of Exercise". Furthermore, repeating the move helps the player perform the move automatically and reach a high level of technical sustainability (Bompa, T.O., 2009). Consequently, it can be said that expertise and skills in technique and tactic are the determining factors of success in team sports (Bompa, T.O., 2012).

The other findings of the study demonstrated that there were no significant differences between goalkeepers of top four teams and Iran's concerning saved shots such as field shots, 6m shots, wing shots, and breakthroughs. However, the observed differences of goalkeepers' saved shots in fast break and 7m throw were significant. These two factors are related to the shots in which the defenders were not effective in catching the ball and the goalkeeper faced the offensive player alone and the chance of offensive player is very high in this position. This is the goalkeeper who has to predict the attacking player's plan and perform the best reaction in least time, because early move helps the attacking player to shoot in the opposite direction of goalkeeper. Enhancing this time management is important and requires training and concentration. In other words, the goalkeeper should react in minimum possible time, i.e. the time interval between providing stimulus (throwing the ball) and starting up (goalkeeper movement) needs to be very short. The total of these two time is called movement time; hence, movement time is the most important element that should be reinforced by training (Rahmaninia, F., 2005). It can be concluded that goalkeepers need techniques such as agility, speed, high excitability threshold, and courage to deal with balls like bullet to stop them entering the goal. Therefore, it is suggested that the technical features of goalkeeper be as follows: 1) having enough speed, 2) paying attention to the ball direction, 3) attention to the size and environment of the goal, 4) recognizing the right direction of the ball, 5) high discrimination ability and speed reaction, 6) high neuromuscular coordination, 7) having appropriate balance, 8) high skill in catching the ball and passing (Pourkiani, M., *et al.*, 2010). It seems that to accomplish these purposes, special attention should be dedicated to selecting goalkeeper coach, because lack of a professional goalkeeper coach results in remaining these shortcomings which has great impact on the morale of other players as well as team success. Moreover, regardless of success or failure in game, a goalkeeper needs to have much leadership and confidence (Clanton, R., 2005). Finally, given the fact that goalkeeper is the last defensive player that stops the ball entering the goal and also the best goalkeeper can save 40 percent of the shots, a goalkeeper therefore has special function who would easily change a team position.

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