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Short notice

UČESTALOST I EFIKASNOST UBACIVANJA LOPTE U IGRU SA STRANE U SAVREMENOM FUDBALU

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Apstrakt: Istraživanjem je pokušano da se rasvetli jedan deo strukture takmičarske aktivnosti fudbala i efikasnost jednog od "prekida igre". Predmet rada predstavlja učestalost i efikasnost ubacivanja lopte u igru sa strane. Cilj rada je da se utvrdi postojanje eventualnih razlika u učestalosti i efikasnosti ubacivanja lopte u igru sa strane na utakmicama finalista i polu-finalista Svetskog fudbalskog prvenstva 2010. godine. Od 255 izvedenih ubacivanja lopte u igru sa strane na tzv."protivničkoj" polovini terena postignut je jedan gol u nastavku akcije posle izvedenog ubacivanja lopte u igru sa strane. Primenom Kruskall Wallis testa između četiri prvoplasirane reprezentacije na Svetskom fudbalskom prvenstvu 2010. godine dobijene su statistički značajne razlike kod izvedenih ubacivanja lopte u igru sa strane u šesnaesterac protivnika ($p=0.003$) i kod upućenog šuta prema голу protivnika, a lopta ode pored ili iznad gola ili je golman uhvati ili odbije ($p=0.009$).

Ključne reči: fudbal, prekidi igre, ubacivanje lopte u igru sa strane, Svetsko fudbalsko prvenstvo 2010. godine.

Uvod

Jedan od ofanzivnih prekida igre u fudbalu su i ubacivanja lopte u igru sa strane. U tu grupu spadaju još i ubacivanja lopte u igru iz ugla, slobodni udarci, kazneni udarci koji se još nazivaju i penali, ubacivanja lopte u igru od strane golmana kada lopta pređe gol aut liniju, a njom je poslednji igrao igrač protivničke ekipe i izvođenje početnog udarca na početku utakmice, početkom drugog poluvremena i posle svakog primljenog gola.

Igrači koji imaju dobru tehniku i koji mogu snažno baciti loptu iz "auta" ostvaruju veliku taktičku prednost. Izvedeci aut u blizini protivničkog gola, igrači mogu postići iste efekte kao da je lopta centrirana nogom pred protivnički gol (Aleksić, 1990).

Jedan od poslednjih primera efikasno izvedenog ubacivanja lopte u igru sa strane dogodio se na utakmici između F.K."Čelzi" i F.K."Pari Sen Žermen" u četvrt-

FREQUENCY AND EFFICIENCY OF PUTTING THE BALL INTO PLAY FROM THE SIDE IN MODERN FOOTBALL

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Abstract: The study attempts to elucidate a part of the structure of competitive football activities and efficiency of the one "interruption of the game." The paper topic is the frequency and effectiveness of putting the ball into play from the side. The paper aims to establish the existence of possible differences in the frequency and efficiency of putting the ball into play from the side at the matches of finalists and semi-finalists of the World Championship in 2010. Out of 255 times the ball was put into play from the side in the so-called "opponent's" half of the field, one goal was scored in the continuation of action after the ball was put into play from the side. By using the Kruskal Wallis test between the four best ranked national teams of the World Championship in 2010, there were statistically significant differences in putting the ball into play from the side as a result of ball throw into the opponent's box ($p = 0.003$) and by the shot of the ball at the opponent's goal, where the ball went near or over the goal or a goalkeeper caught or punched the ball ($p = 0.009$).

Key words: football, game interruption, putting the ball into play from the side, World Championship in 2010.

INTRODUCTION

One of the offensive interruptions of the game in football is putting the ball into play from the side. This group also includes putting the ball into play from the corner, free kicks, penalty kicks, ball throw in by a goalkeeper where the ball goes out of the field as a result of the opponent's shot and kick off shot at the beginning of the match, at the beginning of a second half of the match and after each scored goal.

Players with good technique and who are capable of putting the ball from into play from the side have a significant tactic advantage. By putting the ball from into play from the side players can achieve the same effects as though the ball was passed using a leg in the direction of opponent's goal (Aleksić, 1990).

One of the most recent examples of an efficient ball put into play from the side happened at the match

finalu lige šampiona u sezoni 2013/14. godine. Igrači domaće ekipe su postigli gol u neposrednom nastavku akcije posle izvedenog ubacivanja lopte u igru sa strane i zahvaljujući i tom голу ostvarili su plasman u polufinalu lige šampiona.

Bivši engleski fudbaler član F.K. "Stouk Siti" Rory Delop je bio poznat po "katapultu" u rukama. U karijeri je asistirao pri postizanju golova ubacivanjem lopte u igru sa strane kod 42 gola. Rekord u dužini izbačene lopte iz ruku mu je 45 metara, a prosek 38 metara. Matematičari i fizičari su izračunali da njegova lopta putuje brzinom od 60 km/h i da se kraće pod iglom od 20°. Pod tim uglom mišići leđa i ruku proizvode najveću silu. Svetski rekord u daljini izbačene lopte postigao je profesor fizičkog vaspitanja iz Yorkshirea Donny Brooks sa daljinom od 50 metara. Prethodni svetski rekord u ubacivanju lopte u igru rukom iznosio je 48 metara, a postavio ga je Amerikanac Michael Lochner (Miriam Bruckler i Cicvarić, 2008).

Jedna od karakteristika savremenog fudbala posmatranog i analiziranog naučnim tehnikama i metodama je i izračunavanje kontakt indeksa, a sa njim u vezi i odstupanja od teoretski najjednostavnije igre što se tiče broja dodira lopte prilikom rešavanja tehničko-taktičkih zadataka na terenu u fazi napada (Đošić, 2014.).

Jedan od ključnih preduslova za igranje fudbala na elitnom nivou je igranje sa što manjim brojem dodira lopte (Dellal et al, 2011; prema: San Román-Quintana, 2013.).

U prvoj ligi Srbije u timu F.K. "Bežanija" igrač Ljubo Baranin je poznat po ubacivanju lopte u igru sa strane u šešnaesterac protivnika pred gol. U poslednja dva prvenstva je postignuto više golova u nastavku akcije posle njegovog ubacivanja lopte sa strane. Za vreme igranja u Azerbejdžanu asistirao je ubacivanjem lopte u igru sa strane kod 29 postignutih golova.

Na Svetskom fudbalskom prvenstvu 1998. godine od ukupno 171 postignuta gola jedan je postignut u nastavku akcije posle izvedenog ubacivanja lopte u igru sa strane. Procentualno izraženo to iznosi 1,71% od ukupno postignutih golova (Bray, 2006).

Četiri prvoplasirane reprezentacije se statistički značajno razlikuju u dva od ukupno tri načina izvođenja ubacivanja lopte u igru iz ugla, a kod izvođenja slobodnih udaraca statistički značajna razlika postoji kod sva tri uobičajena načina izvođenja (Đošić, 2013, 2013a). Između istih reprezentacija statistički značajna razlika je utvrđena i kod odigravanja povratnih lopti sa jednim dodiranjem lopte istom igraču od koga je lopta i dobijena u zoni organizacije napada i zoni završnice napada (Đošić, 2013).

between Chelsea F.C. and Paris Saint-Germain F.C. in the quarterfinals of the Champions League in season 2013/14. Players of the home team scored a goal in a direct continuation of action, after the ball was put into play from the side, and due to that goal they went further into the semifinals of the Champions League.

A former English football player, member of the Stoke City F.C. Rory Delap was famous for having a catapult in his hands. In his career, he assisted in scoring goals by ball putting the ball into play from the side for 42 times. His record of throwing the ball is 45 meters, while the average is 38 meters. Mathematicians and physicists have calculated that, when he throws the ball, the speed is 60km/h and the ball flies at the angle of 20°. At this angle, muscles of the back and arms produce the largest force. The world record of the ball thrown in holds a professor of physical education Donny Brooks from Yorkshire, which is 50 meters. Previous record in throwing the ball was 48 meters and was achieved by an American Michael Lochner (Miriam Bruckler and Cicvarić, 2008).

One of the characteristics of modern football, which is observed and analyzed by scientific techniques and methods, is the calculation of a contact index, and in that respect the deviation of theoretically the simplest game regarding the number of ball touches when performing technical-tactical tasks on the field during the attack phase (Đošić, 2014.).

One of the key preconditions for playing elite football is playing with the least number of ball touches (Dellal et al, 2011; according to: San Román-Quintana, 2013.).

In the first Serbian league, the F.C. "Bežanija" football player Ljubo Baranin is well-known for his ball put into play from the side in the box in front of the opponent's goal. In the last two seasons, several goals have been scored in the continuation of action after he put the ball into play from the side. While his was playing in Azerbaijan, he assisted in scoring goals for 29 times using the ball put into play from the side. On the World Championship in 1998, out of 171 scored goals, one was scored as a result of the continuation of action after the ball was put into play from the side. Expressed in percentages it amounts to 1.71% of the total number of scored goals (Bray, 2006).

Four best ranked national teams statistically significantly differ in two out of three ways of putting the ball into play from the corner, and in terms of free kicks statistically significant difference exists in all three most common ways of performing the above mentioned (Đošić, 2013, 2013a). Statistically significant difference was determined in the same national teams in terms of backward pass with a single touch of the ball to the same player

METOD RADA

Posmatrani su DVD snimci utakmica finalista i polufinalista svetskog fudbalskog prvenstva 2010. godine. Ukupno 28 utakmica, po sedam utakmica svake reprezentacije.

Kao merni instrument primenjen je posmatrački list u koji su unošene frekvencije odigravanja pojedinih načina izvođenja, ishoda i ukupno izvedenih ubacivanja lopte u igru sa strane.

Uzorak varijabli

Ubacivanje lopte sa strane unapred prema голу protivnika (APGP).

- ❖ Ubacivanje lopte sa strane unazad prema svom голу (APSG).
- ❖ Ubacivanje lopte sa strane u šesnaesterac protivnika (AULŠ).
- ❖ Upućen šut prema голу protivnika posle ubacivanja lopte u igru sa strane, a lopta ode pored ili iznad gola ili je golman loptu uhvatio ili odbio (APGO).
- ❖ Upućen šut prema голу protivnika i postignut gol u nastavku akcije posle izvedenog ubacivanja lopte u igru sa strane (AŠPG).
- ❖ Ukupno izvedenih ubacivanja lopte sa strane (AUIA).
- ❖ Intervencija protivničke odbrane posle izvedenog ubacivanja lopte sa strane (AIPO).

Ubacivanje lopte sa strane se izvodi kada cela lopta pređe uzdužnu liniju terena po zemlji ili kroz vazduh. Lopta se ubacuje u igru u bilo kom pravcu sa mesta gde je prešla liniju. Ubacivanje lopte u igru vrši igrač ekipe koja nije poslednja igrala loptom. U trenutku kada ubacuje loptu igrač mora biti licem okrenut prema terenu, a delom stopala stajati na uzdužnoj liniji ili van nje. Pri ubacivanju lopte u igru igrač se mora služiti obema rukama i loptu ubaciti u teren sa obe ruke preko glave. Lopta je u igri čim uđe u teren, ali igrač koji je ubacuje ne sme da igra njom sve dok je neki drugi igrač ne dodirne ili njom ne igra. Pogodak ne može biti postignut neposredno iz ubacivanja lopte u igru sa strane.

Obrada prikupljenih podataka je obavljena statističkim softverom SPSS 20. Iz prostora deskriptivne statistike izračunati su: aritmetička sredina, standardna devijacija, maksimalna i minimalna vrednost. Za utvrđivanje razlika na nivou grupa primenjen je Kruskal Wallis test, a za testiranje razlika između parova reprezentacija Mann Whitney test.

who passed the ball in the phase of attack organization and in the phase of attack finalization (Došić, 2013).

METHOD

dVD recordings of the finalists and semifinalists of the World Championship in 2010 were observed; in total 28 matches, 7 matches of each national team. A record of frequency of performing the ball put into play from the side in certain ways, outcomes and a total number of balls put into play from the side was used as a measurement instrument.

Variables:

- ❖ Putting the ball into play from the side forward in the direction of opponents' goal (APGP).
- ❖ Putting the ball into play from the side backward in the direction of own goal (APSG).
- ❖ Putting the ball into play from the side in the opponent's „box“ (AULŠ).
- ❖ A shot towards the opponent's goal after the ball was put into play from the side, where the ball goes near the goal or over the goal or a goalkeeper catches or punches the ball (APGO).
- ❖ A shot at the opponent's goal and a scored goal in the continuation of action after the ball was put into play in from the side (AŠPG).
- ❖ The total number of putting the ball into play from the side (AUIA).
- ❖ The intervention of opponent's defense after the ball was put into play from the side (AIPO).

Putting the ball into play from the side is performed when the entire ball goes over the longitudinal line of the field whether the ball is on the ground or in the air. The ball can be thrown in any direction from the spot where it went over the line. Putting the ball into play from the side is performed by a player of the opposite team of that which touched the ball last. When putting the ball into play from the side, a player must face the field, and partially standing with one foot on the line or outside of it. When putting the ball into play from the side, a player must use his both hands and throw in the ball with both hands over his head. The match starts again when the ball enters the field, but the player who throws in the ball must not touch the ball until another player touches it. A goal cannot be scored by a direct ball put into play from the side.

The processing of collected data was performed by using statistical software SPSS 20. From the area of descriptive statistics, the following was calculated: arithmetic mean, standard deviation, maximum and minimum value. The Kruskal Wallis test was used for determining the differences at the group level, and for the testing of differences between the pairs of national teams the Mann Whitney test was used.

REZULTATI

Ukupno je na posmatranim utakmicama izvedeno 255 ubacivanja lopti u igru sa strane. Primenom strožijeg kriterijuma da u nastavku akcije posle izvedenog ubacivanja lopte sa strane učestvuje do tri igrača ekipe koja izvodi napad nijedna od analiziranih reprezentacija nije postigla gol u nastavku akcije posle izvedenog ubacivanja lopte sa strane. Primenom blažeg kriterijuma kojim se prihvataju golovi i iz akcija u kojima je učestvovalo i više igrača od trojice, jedino je reprezentacija Holandije postigla jedan gol posle tako izvedenog ubacivanja lopte u igru sa strane. U tabeli 1 se vidi da je na jednoj utakmici maksimalno izvedeno 18, a minimalno jedno ubacivanje lopte u igru sa strane na tzv. "protivničkoj" polovini terena odakle postoje realne mogućnosti da se u nastavku akcije posle ubacivanja lopte u igru sa strane postigne gol. Prosečno je izvedeno 9,16 ubacivanja lopti u igru sa strane na tzv. "protivničkoj" polovini terena. Prosečno je po utakmici izvedeno 4,07 ubacivanja lopte u igru sa strane ubacivanjem lopte unapred prema голу protivnika (APGP), 3,86 unazad prema svom голу (APSG) i najmanje ubacivanjem lopte u šesnaesterac protivnika (AULŠ), 1,21. Prosečno je posle izvedenih ubacivanja lopte u igru sa strane intervenisala i do lopte dolazila protivnička ekipa (AIPO) 7,25 puta po utakmici, a maksimalno su igrači protivničke ekipe došli do lopte na jednoj utakmici 16 puta.

Tabela 1. Deskriptivne karakteristike načina izvođenja i ishoda izvedenih ubacivanja lopte u igru sa strane

	APGP	APSG	AULŠ	APGO	AIPO	AŠPG	AUIA
N	28	28	28	28	28	28	28
Mean	4,07	3,86	1,21	0,50	7,25	0,03	9,16
St.dev.	2,52	3,09	1,42	0,88	3,81	0,19	4,48
Max.	9	12	5	3	16	1	18
Min.	0	0	0	0	1	0	1

Legenda: APGP- ubacivanje lopte u igru sa strane izvedeno ubacivanjem lopte unapred prema голу protivnika; APSG – ubacivanje lopte u igru sa strane izvedeno ubacivanjem lopte unazad prema svom голу; AULŠ- ubacivanje lopte u igru sa strane izvedeno ubacivanjem lopte u šesnaesterac protivnika; APGO –upučen šut prema голу protivnika posle ubacivanja lopte u igru sa strane, a lopta ode pored ili iznad gola ili je golman uhvati ili odbije; AIPO- intervencija protivničke odbrane posle ubacivanja lopte u igru sa strane; AŠPG- upućen šut prema голу protivnika i postignut gol u nastavku akcije posle ubacivanja lopte u igru sa strane; AUIA- ukupno izvedenih ubacivanja lopte u igru sa strane na posmatranim utakmicama.

RESULTS

In the course of observed matches, 255 ball put into play from the side were performed. By applying stricter criteria which means that in the continuation of action after the ball was put into play from the side three players of a team participate in the attack, none of the analyzed national teams scored a goal in the continuation of action after the ball was put into play from the side. By applying less strict criteria which means that the goals where more than three players participated were included in the analysis, only the national team of Holland scored a goal after putting the ball into play from the side. Table 1 shows that at one match maximum of 18, and minimum of 1 ball put into play from the side in the so-called "opponent's" half of the field were performed, therefore there is a realistic possibility that a goal can be scored in the continuation of action after the ball was put into play from the side. An average number of the ball put into play from the side in the so-called "opponent's" half of the field is 9.6. Per match, an average number of the ball put into play forward the opponent's goal (APGP) is 4.07, 3.86 backward in the direction of own goal (APSG) and the least number of the ball put into play is in the opponent's box (AULŠ). An opponent's team has intervened and came into the possession of the ball after putting the ball into play from the side (AIPO) 7.25 times on average per match, while the opponent's team players came into the possession of the ball 16 times maximum per match.

Table 1. Descriptive characteristics of ways of putting the ball into play from the side and the outcomes of putting the ball into play from the side

Legend: APGP- Ball put into play from the side forward in the direction of opponents' goal; APSG– Ball put into play from the side backward in the direction of own goal; AULŠ- Ball put into play from the side in the opponent's „box“; APGO–A shot towards the opponent's goal after the ball was put into play from the side, where the ball goes near the goal or over the goal or a goalkeeper catches or punches the ball; AIPO- The intervention of opponent's defense after the ball was put into play from the side; AŠPG- A shot at the opponent's goal and a scored goal in the continuation of action after the ball was put into play from the side; AUIA- The total number of putting the ball into play from the side at the observed matches.

U tabeli 2 su prikazani rezultati testiranja razlika u varijablama kod kojih je utvrđena statistički značajna razlika između posmatranih reprezentacija primenom Kruskall Wallis testa.

Tabela 2. Načini i ishodi ubačenih lopti u igru sa strane sa značajnim statističkim razlikama (Kruskall Wallis test)

Varijabla / Variable	Reprezentacija / National team	χ^2	p	df	Srednji rang / Medium rank
AULŠ	Španija / Spain	13.900	0.003	3	6.00
	Holandija / Holland				14.21
	Nemačka / Germany				16.50
	Urugvaj / Uruguay				21.29
APGO	Španija / Spain	12.517	0.006	3	10.50
	Holandija / Holland				16.07
	Nemačka / Germany				10.50
	Urugvaj / Uruguay				20.93

Table 2 shows the results of testing the differences in variables, by using the Kruskall Wallis test, where a statistically significant difference between the observed national teams was determined.

Table 2. Methods and outcomes from putting balls into play from the side with significant statistical differences (Kruskall Wallis test)

Legenda: AULŠ- ubačena lopta u šesnaesterac protivnika sa strane; APGO –upućen šut prema голу protivnika posle ubacivanja lopte u igru sa strane, a lopta ode pored ili iznad gola ili je golman uhvati ili odbije.

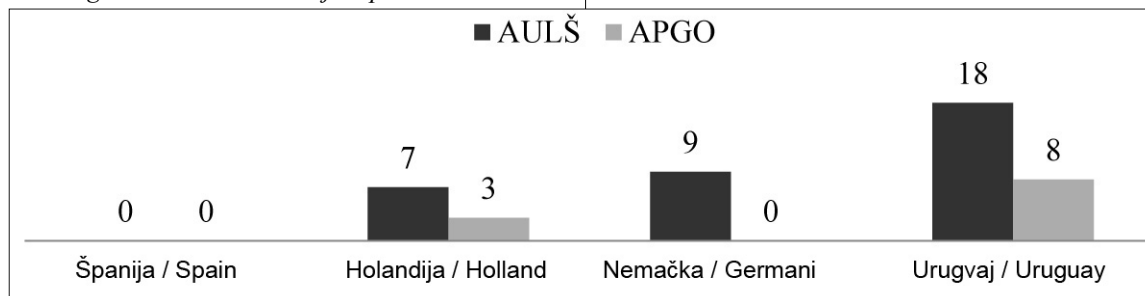
Legend: AULŠ-Ball put into play from the side in the opponent's „box“; APGO—A shot towards the opponent's goal after the ball was put into play from the side where the ball goes near the goal or over the goal or a goalkeeper catches or punches the ball.

Statistički značajna razlika je utvrđena samo kod dve varijable. Kod ubacivanja lopte u igru sa strane izvedenih ubacivanjem lopte u šesnaesterac protivnika (AULŠ) (p=0.003) i kod upućenih šuteva prema голу protivnika posle ubacivanja lopte u igru sa strane, a lopta ode pored ili iznad gola ili je golman uhvati ili odbije (APGO) (p=0.006).

Statistically significant difference was determined in two variables. By putting the ball into play from the side performed by the ball put into play in the opponent's box (AULŠ) (p=0.003) and by performed shoots to the opponent's goal after putting the ball into play from the side, where the ball goes near or over the goal or a goalkeeper catches or punches it (APGO) (p=0.006).

Grafikon 1. Ukupno ubačenih lopti u šesnaesterac protivnika sa strane i upućenih šuteva prema голу protivnika posle ubacivanja lopte u igru sa strane, a lopta ode pored ili iznad gola ili golman uhvati ili odbije loptu.

Graph 1. The total number of the ball put into play the opponent's box from the putting the ball into play from the side and shots at the opponent's goal after the ball was put into play from the side where the ball goes near or over the goal or a goalkeeper catches or punches it.



Legenda: AULŠ- ubačena lopta u šesnaesterac protivnika sa strane; APGO –upućen šut prema голу protivnika posle ubacivanja lopte u igru sa strane, a lopta ode pored ili iznad gola ili je golman uhvati ili odbije

U grafikonu 1 se vidi da reprezentacija Španije nije izvela nijedano ubacivanje lopte u igru sa strane ubacivanjem lopte u šesnaesterac protivnika, a isto i nijedan šut prema голу protivnika posle ubacivanja lopte u igru sa strane na tzv. "protivničkoj" polovini terena. Reprezentacija Urugvaja je izvela najviše ubacivanja lopte u igru sa strane ubacivanjem lopte u šesnaesterac protivnika i najviše šuteva prema голу protivnika, više od zbira ostale tri reprezentacije i što se tiče ubačenih lopti u šesnaesterac protivnika i što se tiče upućenih šuteva prema голу protivnika. Reprezentacija Urugvaja na ovom takmičenju nije postigla ni jedan gol u nastavku akcije posle izvedenog ubacivanja lopte u igru sa strane, ali je stvorila više dobrih šansi za postizanje gola i uputila više udaraca u i pred okvira gola protivnika.

U tabeli tri su prikazani rezultati Mann Whitney testa sa značajnim statističkim razlikama između parova reprezentacija u načinu izvođenja i ishodima izvedenih ubacivanja lopte u igru sa strane. Između reprezentacija Španije i Holandije su utvrđene statistički značajne razlike kod dva od ukupno tri evidentirana načina izvođenja ubacivanja lopte u igru sa strane $p < 0.05$, a u ishodima nisu pronađene statistički značajne razlike $p > 0.05$. Statistički značajne razlike su dobijene kod ubacivanja lopte u igru sa strane izvedenih ubacivanjem lopte unazad prema svom голу (APSG) ($p = 0.039$) i kod ubacivanja lopte u igru sa strane izvedenih ubacivanjem lopte u šesnaesterac protivnika (AULŠ) ($p = 0.008$).

Između reprezentacija Španije i Nemačke je dobijena statistički značajna razlika samo kod ubacivanja lopte u igru sa strane izvedenih ubacivanjem lopte u šesnaesterac protivnika (AULŠ) ($p = 0.008$). Između reprezentacija Španije i Urugvaja je dobijeno najviše razlika, kod ukupno tri varijable. Kod dve koje se odnose na način izvođenja ubacivanja lopte u igru sa strane i kod jedne koja se odnosi na ishod izvedenih ubacivanja lopte u igru sa strane.

From the graph it can be concluded that the Spain national team has not performed a single ball put into play from the side in the opponent's „box“, and the same result is for a shot towards the opponent's goal after the ball was put into play from the side in the so-called “opponent's” half of the field. The Uruguay national team has performed the biggest number of putting the ball into play from the side by the ball put into play in the opponent's box and the biggest number of shots towards the opponent's goal, which is more than a total number of other three national teams regarding the ball put into play from the side in the opponent's „box“ and a shot towards the opponent's goal. On this championship, the Uruguay national team has not scored a single goal in the continuation of action after the ball was put into play from the side, but has produced several good chances for scoring a goal and had several shots within and in front of the opponent's goal.

Table 3 shows the results of Mann Whitney test with statistically significant differences between the pairs of national teams in terms of the way of performing and the outcomes of performed putting the ball into play from the side. Between the national teams of Spain and Holland, statistically significant differences were determined in two out of three recorded ways of performing the putting the ball into play from the side $p < 0.05$, and in the outcomes no statistically significant differences were found $p > 0.05$. Statistically significant differences were found in putting the ball into play from the side performed by the ball put into play backward in the direction of own goal (APSG) ($p = 0.039$) and putting the ball into play from the side performed by the ball put into play in the opponent's „box“ (AULŠ) ($p = 0.008$).

Between the national teams of Spain and Holland, statistically significant differences were determined only in putting the ball into play from the side performed by the ball put into play in the opponent's „box“ (AULŠ) ($p = 0.008$).

The biggest number of differences was found between the national teams of Spain and Uruguay, namely in three variables in total: one is related to the way of putting the ball into play from the side and the other is related to the outcome of putting the ball into play from the side.

Tabela 3. Parovi reprezentacija i varijable sa značajnim statističkim razlikama (Mann Whitney test)

Varijabla / Variable	Reprezentacija / National team	Z	Srednji rang / Medium rank	p
	Španija / Spain		9.79	
APSG	Holandija / Holland	-2.060	5.21	0.039
	Španija / Spain		5.00	
AULŠ	Holandija / Holland	-2.646	10.00	0.008
	Španija / Spain		5.00	
AULŠ	Nemačka / Germany	-2.646	10.00	0.008
	Španija / Spain		10.14	
APSG	Urugvaj / Uruguay	-2.404	4.86	0.016
	Španija / Spain		4.00	
AULŠ	Urugvaj / Uruguay	-3.364	11.00	0.001
	Španija / Spain		5.00	
APGO	Urugvaj / Uruguay	-2.622	10.00	0.009
	Nemačka / Germany		5.00	
APGO	Urugvaj / Uruguay	-2.622	10.00	0.009

Table 3. National team pairs and variables with statistically significant differences (Mann Whitney test)

Legenda: APSG – ubacivanja lopte u igru sa strane izvedena ubacivanjem lopte unazad prema svom голу; AULŠ- ubacivanja lopte u igru sa strane izvedena ubacivanjem lopte u šesnaesterac protivnika; APGO –upućen šut prema голу protivnika posle ubacivanja lopte u igru sa strane a lopta ode pored ili iznad gola ili je golman uhvati ili odbije;

Od načina izvođenja ubacivanja lopte u igru sa strane statistički značajna razlika je utvrđena kod izvođenja ubacivanjem lopte unazad prema svom голу (APSG) ($p=0.016$) i kod ubačenih lopti u šesnaesterac protivnika (AULŠ) ($p=0.001$). Kod ishoda ubačenih lopti u igru sa strane, statistički značajna razlika je utvrđena samo kod upućenih šuteva prema голу protivnika posle ubacivanja lopte u igru sa strane, a lopta ode pored ili iznad gola ili je golman uhvati ili odbije (APGO) ($p=0.009$).

Između reprezentacija Nemačke i Urugvaja statistički značajna razlika je utvrđena samo kod ishoda i to kod upućenih šuteva prema голу protivnika posle ubacivanja lopte u igru sa strane, a lopta ode pored ili iznad gola ili je golman uhvati ili odbije (APGO) ($p=0.009$).

Kod preostalih parova reprezentacija i kod ostalih varijabli nisu utvrđene statistički značajne razlike $p>0.05$.

Legend: APSG– Ball put into play from putting the ball into play from the side backward in the direction of own goal; AULŠ- Ball put into play from putting the ball into play from the side in the opponent's „box“; APGO–A shot towards the opponent's goal after the ball was put into play from the side, where the ball goes near the goal or over the goal or a goalkeeper catches or punches the ball.

In terms of the way of putting the ball into play from the side statistically significant difference was determined in the ball put into play from the side backward in the direction of own goal (APSG) ($p=0.016$) and in the ball put into play from the side in the opponent's „box“ (AULŠ) ($p=0.001$). In terms of the outcomes of putting the ball into play from the side, statistically significant difference was determined only in shots at the opponent's goal after the ball was put into play from the side, where the ball goes near the goal or over the goal or a goalkeeper catches or punches the ball (APGO) ($p=0.009$).

Between the national teams of Germany and Uruguay, statistically significant difference was determined only in the outcomes, namely, shots at the opponent's goal after the ball was put into play from the side, where the ball goes near the goal or over the goal or a goalkeeper catches or punches the ball (APGO) ($p=0.009$).

In the remaining national team pairs and other variables, no statistically significant differences were found $p>0.05$.

DISKUSIJA

Reprezentacija Španije pobednik Svetskog fudbalskog prvenstva 2010. godine nije izvela nijedno ubacivanje lopte u igru sa strane ubacivanjem lopte u šesnaesterac protivnika. To se može protumačiti kao njihova procena da su im takvim razvojem akcije male šanse za dolazak u povoljnu poziciju za upućivanje šuta prema голу protivnika i eventualno postizanje gola. Logična je pretpostavka da su se prilikom donošenja takve odluke rukovodili visinom svojih igrača iz manevarske i napadačke linije. Njihova je procena da su im veće šanse za dolaženje u povoljnu poziciju za upućivanje šuta prema голу protivnika i eventualno postizanje gola kroz kombinacije i zato je u njihovoj igri na posmatranim utakmicama evidentirano 72,30 % izvedenih ubačenih lopti u igru sa strane unazad prema svom голу (APSG), a 27,70 % izvedenih unapred prema голу protivnika ili uz liniju (APGP), a nijedno ubacivanje lopte u šesnaesterac protivnika (AUŠP).

Najviše ubacivanja lopte u igru sa strane izvedenih ubacivanjem lopte u šesnaesterac protivnika je izvela reprezentacija Urugvaja, a i najviše su igrači ove reprezentacije uputili šuteva prema голу protivnika posle ubacivanja lopte u igru sa strane. U nekim situacijama (šansama) su i santimetri nedostajali da lopta završi u mreži. Na osnovu „fudbalskih zakona“ koji su potvrđeni u decenijskoj praksi logično je pretpostaviti da će se reprezentaciji Urugvaja u budućnosti i rezultatski vratiti bar jedan deo na ovom takmičenju nerealizovanih šansi stvorenih posle izvođenja ubacivanja lopte u igru sa strane ubacivanjem lopte u šesnaesterac protivnika.

Jedan od problema u savremenom fudbalu, a koji je prisutan i decenijama unazad je i mala efikasnost, malo postignutih golova. Postizanje golova iz prekida igre direktno ili u nastavku akcije je samo jedan od načina postizanja golova. Analizirajući rezultate istraživanja koja su se bavila postizanjem golova iz prekida igre na prvenstvima sveta, uočava se da se najmanje golova postiže u nastavku akcija posle ubacivanja lopte u igru iz „auta“ (Janković i sar., 2010).

Retki su fudbaleri koji mogu loptu prilikom izvođenja ubacivanja lopte u igru sa strane da ubace ispred protivničkog gola i tako stvore svom timu povoljnu šansu za postizanje gola. Na osnovu rezultata ovog istraživanja vidi se da je od 255 izvedenih ubacivanja lopte u igru sa strane na tzv. „protivničkoj“ polovini terena postignut jedan gol i to primenom blažeg kriterijuma. Kako bi se povećao broj povoljnih situacija (šansi) za postizanje većeg broja golo-

DISCUSSION

The national team of Spain, the winner of World Championship in 2010, has not performed a single ball put into play from the side in the opponent's box. This can be interpreted as their assessment that under such circumstances the chances of creating a good opportunity to shoot at the opponent's goal and eventual scoring of a goal are slim. A logical assumption is that when making such decisions players take into account the height of their players from the maneuver and attack line. Their assessment is that they have bigger chances of creating a good opportunity to shoot at the opponent's goal and eventual scoring of a goal through the combinations, therefore in their game, on the observed matches 72.30% of the performed ball put into play from the side were directed backward to their own goal, (APSG), and 27.70% of the performed ball put into play from the side were directed towards the opponent's goal or along the line (APGP), while not a single ball put into play from the side was performed by the ball put into play the opponent's box (AUŠP).

The largest number of ball put into play from the side in the opponent's box was done by the Uruguay national team, and the players of this national team had the biggest number of shots at the opponent's goal after the ball was put into play from the side. In some situations (chances), the ball missed the goal only by centimeters. According to the "rules of football" confirmed by a decade-long practice, it is logical to assume that in the future, the national team of Uruguay will achieve some results as an outcome of unrealized chances on this championship, in particular chances created after the ball was put into play from in the side in the opponent's box. One of the problems in modern football, which is present for decades now, is poor efficiency, a small number of scored goals. Scoring goals after the interruption of game directly or in the continuation of action is only one of the ways of scoring goals. By analyzing the results of research, which aimed at analyzing scoring of goals on the world championships after the game was interrupted, it can be noted that the least number of goals was scored in the continuation of action after the ball was put into play from the side (Janković et al., 2010).

Individuals who can throw a ball in front of the opponent's box when putting the ball into play from the side are rare, hence they can rarely create a chance for their team to score a goal. Based on the results of this research, it is evident that out of 255 performed ball put into play from the side in the so-called opponents half of the field, one goal was scored where, in the analysis, a

va na fudbalskim utakmicama svih nivoa takmičenja predlog proistekao iz ovog istraživanja je da se „proba“ sa izvođenjem ubacivanja lopte u igru sa strane na tzv. „protivničkoj“ polovini terena nogom. Tako bi se povećala mogućnost da lopta češće dolazi ispred ili u šesnaesterac protivnika odakle su veće i realne mogućnosti za postizanje gola.

U nauci se za proveru pretpostavki primenjuje eksperiment. Predlog je da se u nekoj od nižih seniorskih liga ili ligi omladinaca uvede privremena promena pravila igre i dozvoli izvođenje ubacivanja lopte u igru sa strane na tzv. „protivničkoj“ polovini terena nogom u toku jedne takmičarske polusezone ili sezone i da se posebno evidentiraju postignuti golovi i stvorene šanse u nastavku akcije posle ubacivanja lopte u igru sa strane. Na kraju eksperimenta bi si pomoću osnovnih matematičkih operacija mogla utvrditi eventualna razlika i korist za povećanje efikasnosti na fudbalskim utakmicama izmenom pravila igre i eventualno bi se imali argumenti za predlog promena pravila fudbalske igre odgovarajućim fudbalskim telima na višim nivoima.

ZAKLJUČAK

Istraživanjem je utvrđena mala efikasnost ubacivanja lopte u igru sa strane na utakmicama finalista i polufinalista Svetskog fudbalskog prvenstva 2010. godine. Od 255 evidentiranih ubacivanja lopte u igru sa strane izvedenih na tzv. „protivničkoj“ polovini terena postignut je jedan gol i to primenom blažeg kriterijuma da u nastavku akcije prilikom postizanja gola posle izvedenog ubacivanja lopte u igru sa strane učestvuje više od tri igrača jedne ekipe. Statistički značajne razlike između reprezentacija finalista i polufinalista Svetskog fudbalskog prvenstva 2010. godine primenom Kruskall Wallis testa su dobijene kod ubacivanja lopte u igru sa strane izvedenih ubacivanjem lopte u šesnaesterac protivnika (AULŠ) ($p=0.003$) i kod upućenog šuta prema голу protivnika, a lopta ode pored ili iznad gola ili je golman uhvati ili odbije (APGO) ($p=0.009$).

Kako bi se povećao broj povoljnih situacija (šansi) za postizanje većeg broja golova na fudbalskim utakmicama svih nivoa takmičenja predlog za buduće istraživanje je da se dozvoli u eksperimentalnoj ligi izvođenje ubacivanja lopte u igru sa strane na tzv. „protivničkoj“ polovini terena nogom. Tako bi se povećala mogućnost da lopta češće

less strict criterion was used. In order to increase a number of chances for scoring a bigger number of goals at football matches of all levels, the suggestion, which is actually the result of this research, is to “try” to perform putting of the ball into play from the side in the so-called opponent’s half of the field by throwing in a ball using a leg. In that way, the possibility for a ball to be more frequently in front of or in the opponent’s box would increase, therefore creating a larger number of realistic opportunities for scoring goals.

In science, for the verification of the assumptions an experiment is used. The suggestion is to introduce a temporary change of the rules of the game in a certain lower senior league or junior league for a duration of one season or half of a season, where it would be permitted to perform ball put into play from the side in the so-called opponent’s half of the field by using a leg, and where the scored goals and created chances in the continuation of action after the ball was put into play from the side would be separately documented. At the end of the experiment, by using basic mathematical operations a possible difference and advantage of rules change in order to increase the efficiency at football matches could be determined, therefore the above mentioned could produce arguments for the suggestion of changing the rules of football game, which would be then presented to the appropriate football authorities of high level.

CONCLUSION

Research has confirmed poor efficiency of the ball put into play from the side at the matches of finalists and semifinalists of the World Championship in 2010. Out of 255 recorded ball put into play from the side performed in the so-called opponent’s half of the field, only one goal was scored, where a less strict criterion was used in the analysis, namely in the continuation of action when a goal was scored after the ball was put into play from the side more than three players of the same team participated in the action. Statistically significant differences between the national teams of finalists and semifinalists of the World Championship in 2010 were found by applying the Kruskall Wallis test, namely by putting the ball into play from the side in the opponent’s box (AULŠ) ($p=0.003$) and in shots toward the opponent’s goal, where the ball goes near or over the goal or a goalkeeper catches or punches it (APGO) ($p=0.009$).

In order to increase a number of chances for scoring a bigger number of goals at football matches of all levels, the suggestion for future research is to permit, in an experimental league to put in the ball into play from the side

dolazi ispred ili u šesnaesterac protivnika odakle su veće i realne mogućnosti za postizanje gola.

in the opponent's half of the field by using a leg. In that way, the possibility of a ball to be more frequently in front of or in the opponent's box would increase, which in return would increase the realistic possibilities of scoring a goal.

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