INTRODUCTION

In the contemporary world there is a very small number of sport disciplines that strongly and rapidly attract ever growing number of fans, as in case of the female football. Women’s soccer is one of the fastest growing team sports in the world: from 2000 to 2006 the number of female soccer players registered with FIFA, grew over 50% (FIFA, 2006). Female soccer has over 26 million participants around the world and 208 member associations (FIFA, 2012). Among other, Germany has over one million registered female soccer players (Deutscher Fussbal-Bund, 2009), while both Sweden and Denmark have approximately 60000 registered players (Dansk Boldspil-Union, 2009; Svenska Fotbollföreningen, 2008). During 2006, 448 female international games were played in 134 countries (FIFA, 2007, according to Andersson, 2010).

By the rapid development of a female football, functional demands with which female footballers face become ever growing.

Maybe the best explanation of the way of female football development is given by FIFA in its report from the world championship held in Germany 2011: „Following the spectacular action at the sixth FIFA Women’s World Cup™ in Germany in 2011, it is fair to say that women’s football is continuing to grow and develop. The immense efforts of FIFA and several countries to develop the game in all six confederations have well and truly borne fruit, not only because the game has become more and more popular with women, but also because the quality of the game has improved, as proven by the vast majority of teams in FIFA’s ?agship women’s competition for the best teams in the world. After this Women’s World Cup, all of the experts are in agreement that huge progress has been made in recent years,
whether in terms of the level of play, attacking and defensive moves, or the technical skill of many teams’ players with the ball at their feet, as well as the great cognitive qualities (game intelligence and individual tactics) of the players, and most notably of the most experienced players. Other key findings were the fighting spirit on show and many teams’ determination to attack, as well as the players’ sense of fair play. Nevertheless, this progress in the game, which is often coupled with high speed and the players’ total commitment — most notably in the cases of the USA, Japan, France, Sweden and England — could not have been made without good physical preparation, great psychological qualities and the perfect athletic base."

(FIFA, 2011).

The conclusions derived from the same analysis give the amazing data telling that female footballers at the World championship in Germany in average obtained a longer time interval of an active play (57 min and 27 sec) than male footballers at the World championship held in South Africa (54 min 04 sec).

All mentioned speaks in favour of the fact that a contemporary conditioning training in female football has almost identical demands, tasks and goals as in a conditioning training for male football. If the findings of previous researches at the field of male football are taken into account, one can ask if functional capacities, namely their coordination, function in an identical way.

This is particularly important if it is known that the way of homogenization of some motoricity indicators is not the same for masculine and feminine. Therefore, physiological basis, namely coordination of functional potentials standing behind these movement structures, has different characteristics (Zurc et al., 2005; Bala et al., 2009).

Bangsbo, Mohr, Poulsen, Perez-Gomez, & Krustup (2006) say that the athletic performance in soccer is a function of aerobic fitness, anaerobic fitness, speed, muscular strength, muscular power, and agility.

Speed and acceleration are important aspects in field sports such as soccer (Baker & Nance, 1999).

So, soccer is comprised of intermittent activity where players are required to turn and change direction at varying intensities, which requires well-developed aerobic and anaerobic mechanisms (Hoff, Gran, & Helgerud, 2002)

Earlier researches often more specifically tell about an issue of which potentials are necessary in order to attain topmost football quality, however, the number of previous works dealing with the correlation of these potentials, especially in female football, is much smaller.

As a result of all previously mentioned facts, the basic goal of this research is defined as the ascertaining of mutual connection of basic functional potentials (aerobic ability, speed potential) whose quality is necessary for excellent football results.

METHODS

The participants for this study were 24 female soccer players who are members of the Women’s National football team of Montenegro. The subjects were the following: 8 defenders, 11 midfield players and 5 forwards. Because of characteristics of a play profile of a goalkeeper, they were not subject of this work.

All the players had more than 2 years of experience in the National team. The players were fully-informed of all the experimental procedures before giving their written informed consent to participate.

To assess physical performance, the testing procedure applied included the following tasks: 10 m sprint, Ajax test 5x10 m, 300 yards shuttle, Yo-Yo intermittent recovery test level 1.

Speed potentials like short acceleration were assessed by tests 10 m sprint from a stationary start position. The ability of consecutive sprints with change of movement direction was tested with tasks of Ajax test 5 x10m. Speed endurance was assessed by a test 300 yards shuttle, and aerobic endurance with Yo-Yo intermittent recovery test (level 1).

All tests were performed on an outdoor grass pitch, and electronic timing gates were used to record completion times. Tests were conducted in this order: 10 m sprint and Yo-Yo intermittent recovery test, level 1 (YYIRTL1), on the first day and Ajax 5x10 m and 300 yards (300Y), second day. Subjects performed two trials, with at least 3 minutes of rest between all trials, except for YYIRTL1 and 300Y tests which were realized once. The best performances in each test were used for analysis. All tests were performed more than 48 hours following a competition or hard physical training to minimize the influence of fatigue on test performance.

Descriptive statistics (minimum, maximum, mean, standard deviation) were calculated for all physical performance characteristics variables.
This study used a quasi-experimental, cross-sectional approach to examine the relationship between motoricity indicators. The Pearson Product-Moment Correlation was used to determine the relationships among the following variables: Yo-Yo intermittent recovery test, level 1 (m), 10 m sprint (s), Ajax 5x10 m (s) and 300 yards (s). The criterion for significance was set at an alpha level of $p < .05$. All statistical analyses were conducted using version 21.0 of the Statistical Package for the Social Sciences (SPSS, 2012).

**RESULTS AND DISCUSSION**

On the basis of numeric values given in the table 1, it can be seen that the sample of the examinees for this research consisted of 24 female footballers of Montenegrin national team aged of 21.8±1.93 years, with football experience lasting 10.08±2.19 years, average body height of 168.25±7.33 cm and body mass of 59.48±7.45 kg. With these characteristics, Montenegrin female footballers, in relation to their fellows from other environments, have higher body mass than female footballers from the following works (Sirotic & Coutts, 2007; Scott, 2007; Nesser & Lee, 2009; Andresson, 2010; Sporiš, Jovanović, Krakan, & Fiorentini, 2011) and lower body mass than the examinees obtained in this research on tests YYIRTL1 are significantly lower than the results obtained by the female footballers within researches in other environments.

The results which the examinees accomplished at tests for estimation of functional potentials are given in table 2. Comparing them with the results which the female footballers accomplished in other researches, it can be concluded that the members of Montenegrin football national team are on approximately the same level as the female footballers from other countries considering speed potentials whether we consider start acceleration, consecutive sprints or speed stamina. However, on the other side, the results which the examinees obtained in this research on tests YYIRTL1 are significantly lower than the results obtained by the female footballers within researches in other environments.

**Table 1: Descriptive Characteristics of participants (24)**

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yr)</td>
<td>18</td>
<td>26</td>
<td>21.87</td>
<td>1.98</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>156.00</td>
<td>182.00</td>
<td>168.25</td>
<td>7.33</td>
</tr>
<tr>
<td>Mass (kg)</td>
<td>51.70</td>
<td>74.70</td>
<td>59.48</td>
<td>7.45</td>
</tr>
<tr>
<td>Play. exper. (yr)</td>
<td>6</td>
<td>13</td>
<td>10.08</td>
<td>2.19</td>
</tr>
</tbody>
</table>

**Table 2: Descriptive Characteristics of performance**

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10m (s)</td>
<td>1.77</td>
<td>2.43</td>
<td>2.04</td>
<td>.14</td>
</tr>
<tr>
<td>5x10m (s)</td>
<td>20.05</td>
<td>24.80</td>
<td>21.81</td>
<td>1.19</td>
</tr>
<tr>
<td>300y (s)</td>
<td>60.00</td>
<td>71.92</td>
<td>66.57</td>
<td>3.15</td>
</tr>
<tr>
<td>YYIRTL1 (m)</td>
<td>520.00</td>
<td>1280.00</td>
<td>836.66</td>
<td>255.96</td>
</tr>
</tbody>
</table>

As the YYIRTL1 is one of Yo-Yo tests which are recommended as the best tests for the estimation of PMP (physical match performance) in football (Mohr, Krstrup, & Bangsbo, 2001; Krstrup, Mohr, Ellingsgaard, & Bangsbo, 2005) and that it is connected with sport-specific activities in foot-

Figure 1 (left): The scatter plot and line of best fit for the relationship between the YYIRTL1 and 10 m sprint time ($r = -.24, p > .05$)
ball (Krustrup et al., 2003), namely on the basis of previously said it can be assumed that Montenegrin female footballers accomplish lower PMP level than their fellows from other national teams.

The basic aim of this research was to discover the fact if there was and how big was the level of connection between manifest indicators of aerobic stamina, start acceleration, consecutive sprints and speed stamina. The results, found in this study, tell that there is no a statistically significant connection between the results on YYRTL1 test and motoricity tests sprint 10 m (the scatter plot and line of best fit for the relationship between the YYIRTL1 and 5x10 m (r = .19, p > .05) can be seen in Figure 2) and 300 yards (the scatter plot and line of best fit for the relationship between the YYIRTL1 and 300 yards shuttle run time can be seen in Figure 3).

On the other side, considering the relationship between the tests 10 m sprint (r=.39, p<.05), then 10 m sprint and 300 yards (r=.48,p<.01) and finally, 5x10m and 300 yards (r=.48,p<.01), statistically significant connection of the results for the estimation of different speed qualities which are applied in this research can be ascertained. The scatter plot and line of the best fit for the relationship between the 10 m sprint time, 5x10 m and 300 yards shuttle run time can be seen in Figure 4, 5 and 6.
CONCLUSION

The results obtained in this study lead to the conclusion that female footballers who have a higher level of one of speed qualities, also obtain better results in other tests of this character. This means that Montenegrin female footballers having a higher level of starting acceleration were better in repeated short sprints and also in the activities of speed stamina. The negative correlation coefficients between the tests YYRTL1 and 10 m sprint, and 300 yards, suggest that a sizeable, although not statistically significant number of Montenegrin female footballers who obtained good results on one of these tests, also had a good result on remaining two tests. It is very characteristically that such a case is not repeated on 5x10m test, therefore it can be concluded that the results on this test were determined by other factors in relation to the remaining tests. Since, on the basis of the entire sample, the results on YYRTL1 test, considering the results on this test in other works, are generally of low level, the obtained values of correlation coefficient of these tests with other tests must be carefully taken into account. In any case, it is a very important data telling that the female footballers with higher start speed qualities in the same way manifest in other fields of speed as a motoricity ability, even in those utmost such is a speed endurance, which in an energy sense go into the abilities of different character. Additional researches of this topic could lead to stronger concretization of these conclusions when considering elite female footballers and these abilities of theirs.

REFERENCE


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