The effect of national team training on lower extremities injuries in elite female taekwondo athletes

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Abstract

Taekwondo is an exciting and popular sport field. Through many risk factors in this field that causing body injuries in athletes. The aim of this study was to investigate the effect of a preseason high intensity training period on appearance of lower extremities injuries (joint, muscular, skin, bone) in elite young and teenage female taekwondo athletes. Therefore we collected the data of 12 teenage females with mean age 15.5±0.71 years, weight 49±4.2 kg, height 166.5±0.71 cm, and with sport background 5.04 years, and 12 young females with mean age 20.43±1.9 years, weight 64.6±9.5 kg, height 171.9±6.9 cm, sport background 9±4.4 years, that were in national team camp, to prepare for London 2012 Olympic games and Asian competitions. We provided a questionnaire to found the injuries in different limbs of participations that record the injuries in three stages (start of camp, 6th week and 12th week of preparation training). The research method was semi experimental and used mix repeated measure (p≤0.05).

The results showed that there are no significant differences between joint, muscular, skin, and bone injuries between young and teenage groups. Also there is no different between the stages of training. More over the most injuries were muscular injuries that frequently observed in lower extremities of young athletes. Thus we propose that medical practitioners of teams, athletes and coaches must remember the points mentioned in this research to prevention the lower extremities injuries.

Key words: injury, female, taekwondo

Introduction

Scientific studies are the most valuable base of athletics. Making efforts to be in international sport arena, without scientific findings is a useless struggle. Today knowing the acquired and instinctive capabilities and the final physiologic capacities needed for body and spiritual limits of man are the most important basic principles to foster the champion athletes (Manavi Shad, 2008). Also in spite of increasing developments and use of the other science findings in this field, access to success and sport valuable results isn’t easy, but there are problems that threaten the health of athletes, so that we can’t remember any athlete (trained or untrained) without injuries that might have ended him/her sport activities (Agel et el., 2007; Faude et al., 2005). Many of sport fields form beginning to present had, more changes, for example in taekwondo the game etiquette and lower have changed. One of the issues that caused compilation of new lows and change of some techniques, are findings of researches identifying the risk factors and rules that caused less physical contact between the players. However more researches in this field are needed to reduce the injuries (Badekas et al., 2009; Darrow et al., 2009; Jungeet al., 2009). Among the body injuries, the lower extremities injuries are the most (Faude et al., 2005). More exercise injuries occurred in lower extremities, Bahr and Reeser (2003) reported that 10-19% acute injuries that repair in emergency service centers are arising from exercises and most of them are in lower extremities specially in knee and ankle (Bahr et
These injuries lead to absence of athletes for duration of 7 training sessions or competitions (Kofotolis et al., 2007). These injuries often occur by contact, especially physical contact between players. The risk of lower extremities injuries is more in sport activities like taekwondo because in this sport point awards frequently by blowing the rival, and in nearing each other, and also in sport activities like football, basketball and handball. Because these activities are accompanying with rotation, change direction and running (Kazemini, 2008). These results showed that we must be serious about athlete injuries in deferent sport field, and in any stage of training and competition. In all Olympic game the most medals in different sports are earned by champions of weight lifting wrestling, taekwondo (Mousavi, 2003). Markovichetal, (2005) evaluated the profile of 8 female taekwondo athletes to investigate the physiological and physical specification that distinguish the trained and untrained athletes. Their results showed that successfully taekwondo athletes were taller and had less lipid profiles, and their running speed and VO2 max were significantly more than unsuccessful athletes. And also their heart rate was less during running. These differences not alone improved their performance but decrease their injuries too (Markovich et al., 2005). Maybe we can’t prevent the injuries in athletes definitely but by knowing the risk factors we can found the better prevention instructions and perfect remedy to reduce the injuries. Since there isn’t any methodical research on female taekwondo athlete’s injuries in Iran, we decided to investigate the effect of national team training on physical injuries in lower extremities of elite female taekwondo athletes in 90-91.

Materials and Methods

This research method was semi-experimental. Statistical sample of this research included all female taekwondo athletes that were in national team camp. Therefore we choose 12 teenage female taekwondo athletes with mean age: 15.5± 0.71 year, mean weight: 49±4.2 Kg, mean height: 166.5±0.71cm and 12 young female taekwondo athletes with mean age: 20.43±1.9 year, mean weight: 64.6±9.5 Kg, mean height: 171.9±6.9 cm, who had a back ground of at least 3 years. In national team camps or champion matches. Which in that time they were in national team camp to preparing for London 2012 Olympic game and Asian competitions. Our evaluation tool was a questionnaire that planning regarded to opinion of professional masters of this field to identify the cause and time of appearance of physical injuries (joint, muscular, skin, and bone injuries in lower extremities) in participations. Also for validating the questionnaire, we referred it to 7 of professional master and they confirmed it after evaluating the questionnaire. Female taekwondo national team training program for teenage and young athletes was performed in federation of taekwondo. At the beginning of training program a pre-test was obtained at the morning and in a equal conditions form both teenage and young female taekwondo athletes and then at the end of 6th week of training the second stage of test was obtained. And then in the end of program (12th week) that accompany with low intensity training, the third stage of test was obtained from both groups at the same time. The training program was performed for 3 constant months by 6 days per week, and 3 session per day that totally included 7 hours training per day (6-7:30 am, 9-12 noon, 15.30-19 afternoon) and in the last week by decreasing the training volume, the program was performed for 2 session per day and totally for 3 hours in a day (10-11:30am, 16-17:30afternoon). Mix repeated measure (p≤0.05) used for analyzing data with SPSS 19.

Results

The results of this study showed that the most lower extremities injuries were in young athletes. And the most percent of them were the muscular injuries. Totally the muscular injuries by 91 percent were the more frequently injuries and then the bone injuries by 83 percent and in third degree the skin and joint injuries by 58 percent that were the least amount of injuries. In the first stage of training program 58 cases, in the second stage 43 cases and in the third stage 33 cases of muscular injuries have been reported, that the most frequently injuries in them were contusions of keen, ankle and toe. The most straining was in ankle and femur and the most spraining was in femur of athletes. In the case of bone injuries the results showed that in the second stage of program the number of injuries athletes and the frequency of injuries in lower extremities of taekwondo athletes was more than the other two stages. Also the results have shown that joint injuries volume in each stage was less in compared to previous stage. The frequency of skin injuries showed that in the first stage of the program the amount of lower extremities injuries in taekwondo athletes was less than the other two stages. And the most frequency of injuries observed in the second stage of training.
The result showed that there aren't any significant differences between joint, muscular, bone and skin injuries and also about the volume of injuries between the training stages among the both young and teenage groups (table 2).

**Table 2: The results of mix repeated measure analysis**

<table>
<thead>
<tr>
<th>Resources</th>
<th>Total square</th>
<th>Freedom degree</th>
<th>Mean square</th>
<th>F</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone injuries</td>
<td>0.5350</td>
<td>2</td>
<td>0.288</td>
<td>1.288</td>
<td>0.29</td>
</tr>
<tr>
<td>group * training</td>
<td>0.091</td>
<td>2</td>
<td>0.045</td>
<td>0.128</td>
<td>0.805</td>
</tr>
<tr>
<td>Joint injuries</td>
<td>0.271</td>
<td>2</td>
<td>0.108</td>
<td>0.465</td>
<td>0.632</td>
</tr>
<tr>
<td>group* training</td>
<td>0.291</td>
<td>2</td>
<td>0.145</td>
<td>0.624</td>
<td>0.542</td>
</tr>
<tr>
<td>Skin injuries</td>
<td>0.817</td>
<td>2</td>
<td>0.408</td>
<td>1.738</td>
<td>0.192</td>
</tr>
<tr>
<td>group * training</td>
<td>0.446</td>
<td>2</td>
<td>0.223</td>
<td>0.950</td>
<td>0.397</td>
</tr>
<tr>
<td>Muscular injuries</td>
<td>0.257</td>
<td>2</td>
<td>0.129</td>
<td>0.751</td>
<td>0.48</td>
</tr>
<tr>
<td>group * training</td>
<td>0.257</td>
<td>2</td>
<td>0.129</td>
<td>0.751</td>
<td>0.48</td>
</tr>
</tbody>
</table>

**Discussion and Conclusion**

There weren’t any significant differences between joint, muscular, skin and bone injuries among the both young and teenage groups. And also there isn’t any significant difference among the volume of injuries between the training stages. More over the most injuries were in the lower extremities of young athletes and it was the muscular injury. In taekwondo because the scoring is by foot (lower extremities) blows, therefore most of contacts between players are in lower extremities. These findings are corresponded to previous studies (Kazemini, 2008; Agel et al., 2007). In another research by Faude et al. (Faude et al., 2005) the 80 percent of frequent injuries were in lower extremities. Lindenfeld and Putukian have reported the similar results. Wong and Hong (Wong, 2005) Classified the injuries to 4 categories that included sprain, strain, contusion, ligament inflammation, fracture and they reported that the most injuries were kind of sprain, strain and contusion. The reason of this matter was more activity of lower extremities in the sport like taekwondo and football and etc. The players for proper defenses have to displace and being in an ideal position to blow the rival, changing subordinate paths, foot dancing etc. and these movements increase the lower extremities injuries (Kazemini, 2008). In this case it is demonstrated that keen and then ankle are the most injure able parts of body. Bahr and Reeser (Bahr et al., 2003) and also Lindenfeld (Lindenfeld et al., 1994) in an investigation about soccer player injuries have shown the similar results. Knee and ankle because of their basic role in most activities like running, jumping, changing direction of movement suddenly and because these parts of body have to sustain body weight so always are exposed to injury risk (Wong, 2005). One of the probable reasons for ankle injury is the blow by top of the foot so the injury of ankle during movement for assault and disassault, blowing, blowing of rival, reciprocal blows in game, scoring by blowing rival is more probable (Mousavi, 2003; Kazemini, 2008). Musavi (2003) repotted that the most important cause of knee and ankle injury is bad warming up and after it the second reason is training ground surface that regarding to this matter that all participants in our study were elite taekwondo athletes in the country and the best facilities are available for this level athletes, so a
ground with proper floor provided for them and thus the injuries resulting from bad ground surface significantly are reduced (Mousavi, 2003). The results of this study showed that in the second stage of training, contusion (58%), strain (28%) and bone and skin injuries between elite female taekwondo athletes were more than other injuries. Current results are corresponded with findings of Rahnama et al. (2006), Kazemini (2008), Junge et al. (2009) and are unsimilar to Manavishad (2008) and in the match base to Martic (2007). Manavishad (2008) has repotted in math base ligament sprains (32%) and contusions (28%) were more than other injuries. Marti (2007) has reported spraining (40.5%), contusion (23%) were more than other injuries too.

Maybe one of the probable reasons of diminishing contusion and straining in Manavishad study differences between male and female. It can be pertained to weak body structure and less muscle strength of females and their scanty experiences and skills compare to males, so they can’t completely control the blows and avoided the movement injuries like falling and inflicting rival blows. But instead during matches the injuries among male athletes are more than female athletes because the competition level of males is higher than females and ever higher level is in the game the speed of movements and physical contacts would be more intense and therefore the injury volume will be more too. The speed of blows between females is slower than males so may be less physical contact and contusion occur during female competitions (Marti et al., 2007; Lindenfeld et al., 1994). The difference between ages of player in Marti (2007) study maybe probable reason of conflict findings of these two studies. His study was about mid team but this investigation was about elite young and teenage taekwondo athletes. High volume of contusion and strain injuries among taekwondo players maybe because of speed of blows, small size of ground, stiffness of ground and contact ability of this sport field. Also pre-season preparing training and blasting movements like blow to meat before proper warning-up, resume training or competition before complete amelioration of previous injury and insufficient sport facilities maybe the reason of these injuries (Kazemini, 2008).

References


Manavi Shad M, 2008. Longitudinal study of the prevalence, incidence and mechanisms of sports injuries in women's national futsal team training. MSc thesis, Tehran University


