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USING TREADMILLS

TO IMPROVE SPRINTING: A PILOT STUDY BY SOCCER FITNESS

BY RICHARD BUCCIARELLI

Statistical Analysis by Justin Cresser

HIGH SPEED/HIGH INCLINE RUNNING TREADMILLS FOR REPEATED SPRINT TRAINING:

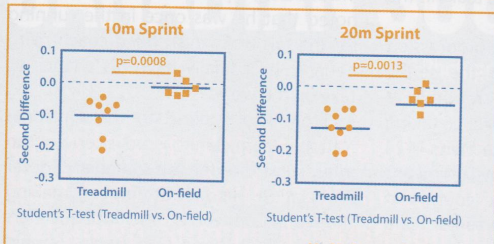
In Canadian youth soccer, the pre-season period prior to the outdoor season typically lasts six to eight weeks, beginning in mid- to late-March and ending in mid- to late-May. Repeated sprint training, consisting of 10 or more repetitions of high/maximal intensity runs/sprints, is a commonly used training method during soccer pre-season.

This type of training is especially useful during pre-season because it has been shown to improve both speed, as well as high intensity running ability. Studies done on soccer players, as well as athletes in other sports, have demonstrated the effectiveness of a "ground-based" (running sprints on the ground) repeated sprint training protocol on improving speed and high intensity running ability. High speed/high incline treadmill training (using specialized high speed running treadmills) is an alternative method of performing repeated sprint training.

At Soccer Fitness, we decided three years ago to make repeated sprint training using high speed/high incline treadmill running the focus of our strength and conditioning programs at our new facility - the Soccer Fitness Training Centre. We reasoned that when compared to "ground based" training, high speed/high incline treadmill training was more advantageous in that the workloads (speed, and % incline) could be more closely controlled. Treadmill training also holds other advantages over ground-based training, including the addition of a spotter, who can help the athlete perform higher speed runs than could normally be completed, by spotting/pushing on the athlete's lower pelvis.

We believe so much in our training protocols that, during the spring 2013 pre-season, we decided to put our training to the test, by conducting a six-week training-based study, comparing two different kinds of repeated sprint training (our incline treadmill protocols, versus a more conventional and previously used ground-based running protocol). To date, there have not been any studies comparing a ground-based versus a treadmill-based protocol for repeated sprint training on youth soccer players. The aim of this study was to examine the differences in speed and high intensity running ability following a six-week, two-days-per-week repeated sprint protocol of ground-based versus treadmill based repeated sprint training.

Subjects participating in this study were female members of a local Toronto area youth soccer club, aged 14-17, who were randomly assigned to Treadmill Training ("TT") vs. Ground-Based Training ("GBT") using simple computer-generated randomization. Nine players in total



Q: Is there a change in test performance over time?

Compare differences in each group to a hypothetical value of '0' – indicating training had no impact on performance.

10m Sprint
Treadmill: p=0.0003 yes
On-Field: p=0.507 no

20m Sprint
Treadmill: p<0.0001 yes
On-Field: p=0.0508 no

35m Sprint
Treadmill: p=0.0031 yes
On-Field: p=0.0016 yes

Yo-Yo Intermittent Recovery Test
Treadmill: p=0.0028 yes
On-Field: p=0.0011 yes

participated in the Treadmill Training Group, and eight players in total participated in the Ground-Based Training group. Both groups performed a six-week, two-sessions-per-week repeated sprint training protocol, comprising 15 repetitions of a six-second maximal effort, with 60 seconds of passive recovery in between.

At baseline, the TT vs. GBT groups were comparable with similar times in 10m, 20m and 35m sprint tests. Improvement in sprint performance was assessed following six weeks of training by comparing the differences in sprint times pre- and post-training. Following six weeks of training, girls randomly assigned to TT had significant improvements in 10m, 20m and 35m sprint performance. There was no difference in distance covered pre- and post- test between TT and GBT in the Yo-Yo Intermittent Recovery Test. When evaluating program effectiveness, there was a significant improvement in player performance in the TT group for all tests post-training (10m, 20m, 35m sprint and Yo-Yo Intermittent Recovery Test). The GBT group showed improved performance in 35m sprints and the Yo-Yo Intermittent Recovery Test, but not in the shorter sprint distances (see Figure 1 for a further explanation of these results).

Results of the study indicated that Treadmill Training produced a significantly greater increase in running speed, with a small – but also greater – increase in high intensity running ability, than On-Field Training. When considering the results of this study, as well as the other aforementioned benefits of Treadmill Training, it appears that Treadmill Training is at least as effective, if not more effective, as a method of pre-season repeated sprint training, than On-Field Training. More research, involving larger sample sizes, is required before definitive conclusions can be made.

At Soccer Fitness, these results impressed us so much they prompted us to make similar changes to our own Treadmill and Plyometric Training Protocols. Beginning in August, 2013, training sessions at the Soccer Fitness Training Centre will be more intense than ever. In order to maximize training volume every hour, each training session will include incline treadmill sprints, harnessed/over-speed treadmill sprints, and plyometric exercises. Work-to-rest ratios will be kept to a maximum of 1:4, so as to ensure that the intensity of training stays high. All athletes training with Soccer Fitness will now be able to get even more out of every training session.

We are very excited for the fall 2013 off-season, and we are sure our athletes will be as well.

- **Justin Cresser**, Technical Director, SC Toronto
- **Frank Iaizzo and Peppe Raso**, Technical Directors, International FC
- **Matija Vugrinicek**, Senior Strength and Conditioning Coach, Soccer Fitness
- **Julia Burgess**, Head Coach, SC Toronto 1998 Girls
- **Mario Consiglio**, Head Coach, SC Toronto 1995 Girls
- And all the players from the SC Toronto 1998 and 1995 Girls!

Richard Bucciarelli is President of Soccer Fitness Inc., a company that provides soccer-specific strength and conditioning to individuals, teams, and clubs in the Greater Toronto Area. Beginning in August, 2013, the Soccer Fitness Training Centre will be offering brand-new Treadmill and Plyometric Training Programs. For more information about Soccer Fitness Inc., visit www.soccerfitness.ca