RECOVERY STRATEGY IN TRACK AND FIELD SPEED RUNNERS

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Abstract: Recovery strategy from training and competition is complex process and depends on the nature of effort performed. Optimal recovery is the result of physiological and psychological restoration, so that the athlete can compete or train again at an adequate level. The literature presents a lot of recovery methods used by athletes to get an optimal status for training and competitions.
The goal of the paper is to presents the recovery strategy used by athletes specialized in track and field speed running events.
The study method used is review of literature as studies, books, articles published in national and international field.
There are some natural recovery methods used by athletes to clear the fatigue. Some of the most popular recovery techniques for track and field runners include sleep, active recovery, stretching, hydrotherapy, massage, and nutrition.
Key words: recovery, track and field, sprint runners

Introduction

High performance athletes participate in several training sessions per day and a lot of training per week. This means great physical and mental energy consumption. Trainings and competitions extend the body's physiological limits. Intensive and prolonged efforts affect psychological system, too. So, the athletes became too tired to continue the sport efforts. Athletes fatigue is combated by recovery.

Specific effort on sprint events

The race over short distances, named sprint are old events in the track and field competitions. The events currently held in the classical competitions, as Olympics Game, World, European and National Championships are: 100 m, 200 m, 400 m for males and females. In the same category there are the hurdles races on 100 m females and 110 m males. The relay races 4x100 m and 4x 400 m are part of speed races. The specific effort of the sprint runners takes place under anaerobic conditions. The athlete's effort is done on limited ventilation, meaning suspension or reduced breathing. The energy provider is the phosphagen system (ATP and CP) which releases fast a great energy amount. For the events on 100 m, the energy is released with lack of oxygen, and without the appearance of lactic acid. This kind of energy supports maximal efforts held in very short time (10 secundes). So, the 100m sprint is an anaerobic alactacid event relying heavily on energy supply from the ATP-PC system [1]. All the other sprint events have the support of anaerobic lactacid. For these events the source of energy is ATP obtained from carbohydrates as glycogen. The process in named anaerobic glycolysis and the energy is submaximal for 60 secundes on the events longer than 100 m. But the amount of energy is limited by lactic acid that induces the fatigue.

Recovery in sports

Recovery is a concept that belongs to the field of physical education and sport. Recovery is a process that interest physical education activity and athletes' training. Recovery is a natural and spontaneously process that starts immediately after the end of the effort. Recovery has some synonyms that explain the process.
Dragan, I. chose terms like "*biological rebalancing*" or "*regeneration trophic*". The author named the recovery *an indirect form of body energy training. In sports recovery is the stage of biological training for competitions* [2]. Deep in sport recovery it is necessary to reach the superior level of the process obtaining the overload energy.
According to Bompa T. *recovery is a multidimensional process that depends on internal and external factors* [3]. A new approach has Mihailescu [4] and used for recovery "*monitoring capacity for recovery*". That means "*relation among testing, measuring and evaluation on psychological, physiological and social status, by interdisciplinary team."* Kelleman quote by Mihailescu, P. [5] considers that *recovery is specific to each athlete and depends on his own appreciation.*
Specifics track and field speed runners recovery is neuromuscular and endocrine metabolic recovery. The most used recovery

strategy is: sleep, nutrition, recreational activities, stretching, hydrotherapy, massage.

Sleep

Sleep is the most important recovery mean. It is a natural and handy mean used by anyone. Sleep becomes the best recovery for athletes. Sleep can be defined as "*a reversible behavioral state in which an individual is perceptually disengaged from and unresponsive to the environment"*[6].

Sleep had important functions in physiological and psychological sphere to high performance athletes. This is more emphasized for track and field speed runners. The neuropsychiatric aspect is very important for the athletes that have to perform in limited time and the technical demands are complex.

We think to artistic gymnastics events as floor exercise, balance beam, uneven bars and vault. There is the same situation on rhythmycal gymnastics events.

Leeder at al. recorded that an athlete group had a total time in bed of 8:36 ± 53 minutes. Further their study demonstrated that "*while athletes had a comparable quantity of sleep to control group, significant difference were observed in the quality of sleep*". They found out that *"the athletes group had significant longer sleep latency"* [7].

Erlacher at al. study relived *"65.8% of athletes experienced poor sleep in the night(s) before competition once in their lives and 62.3% at least once during last year*." The same study indicates that "*athletes of individual sports have more sleep difficulties*" [8].

Halson says that "*sleep deprivation can have significant effects on elite athletes, especially submaximal exercises*". In the same time "*sleep extension or napping may be useful to increase the total number of hours of sleep*" [9]. A low sleep quality or quantity affects sport efficiency (table 1).

Table 1.A taxonomy of sports and recreational activities affected by sleep lost Halson [10]

Characteristics	Sports	Effects
Low aerobic	Road cycling	Increased errors
Moderate aerobic	Team sports	Decreased decision making
High aerobic	Running 3000m, swimming 400m	Marginal
Aerobic/anaerobic	Swimming, middle distance running	Decreased power
Anaerobic	Sprints, power events	Marginal
Repeat anaerobic	Jumping events, weight-training	Increased fatigue

In a study from the Australian Institute of Sport, athletes appreciate sleep as the most evident problem that causes fatigue [11]. "*Sleep disturbances in athletes happened before important competitions and during normal trainings"*, conclude Halson [12]. The first time is induced by the competitions tasks and the second time by the habitual sleep efficiency.

So, track and field speed runners have to go to bed each night at the same hour and accumulate about 8 hours per night and get up at the same hour in the morning. Sleep is the most important way for track and field speed runners' recovery.

Nutrition

Training is the predominant goal in the life of athletes. ATP replenishing is made from oxygen by carbohydrates and fat. An important part is won recycling lactic acid.

Phosphagen regenerates fast in track and field 100 m, because the effort consumes less phosphagen. Creatine phosphate regenerates a little bit more, phosphagen system regenerates in minim 2 minutes and maximum 3-5 minutes.

Muscle glycogen is a fuel for aerobic and anaerobic athletic sports. Muscle glycogen is limited in muscle and it is used fast by intense effort. When muscle glycogen got at low level in the muscle, liver glycogen intervenes as support of the effort.

Depletion of glycogen and low blood glucose induces fatigue. Burke [13] suggest the carbohydrate everyday intake in the recovery period for the athletes are training at least once a day (table 2), and practice exercises that need muscular glycogen stores.

Foods rich in carbohydrates facilitate full restoration of muscle glycogen. First 5 hours after effort the muscular glycogen has the faster recover. That underlines the importance of food rich in carbohydrates.

Protein intake higher than recommended may be consumed as part of high-energy diet. For track and field speed runners the need of protein is higher. That is a benefit in muscular growth.

Table 2 Guidelines for carbohydrate intakes daily training

Activities	Carbohidrate intake
Immediate recovery after exercises (0-4 ore)	1.0-1.2 g · kg^{-1} · h^{-1}
Daily recovery: moderate-duration/ low-intensity training	5.0-7.0 g · kg^{-1} · day^{-1}
Daily recovery: moderate to heavy endurance training	7.0-12.0 g · kg^{-1} · day^{-1}
Daily recovery: extreme exercises programme	10.0-12.0+ g · kg^{-1} · day^{-1}

For athletes who are training high intensive efforts Ionescu & Anton [14], Vajiala, [15] suggest about 1.5-1.8 g · kg^{-1} · day^{-1}. More than this the athletes which practice exercises that need power the protein intake is about 2.3-2.5 g · kg^{-1} · day^{-1}. The diet after high efforts must have less protein. Digestive system is not enough prepared to process the protein food.

Another important aspect in nutrition is hydration. Speed runners should assess their hydration status. They have to personalize hydration, according to environment temperature, exercises duration and intensity. The hydration strategy must starts before the training adding the vitamins and minerals needs. They drink fluids to maintain hydration and balance of electrolytes (sodium, potassium, and magnesium).

Active recovery

Active recovery means a completing and accelerating workout at a low intensity, but high enough that it gets the blood moving. The low intensity exercises reduce residual fatigue and the lactic acid level in the muscle and blood. After intensive effort or stress competitions, in any one day the runners spend relaxing workout or post-exercises recovery.

There are various activities that runners could choose. It is important to find one those suit and enjoy them. The best activities the track and field speed runners can choose are swimming, cycling or basketball. It is important to perform at 60-70% effort intensity, restorative pace.

According to Bota [16] "*the active recovery lasts less than 45 minute and 120-130 heart rate"*. Lum et al. [17] study investigated the effects of a swim recovery session on subsequent running performance and reported an increase in performance when compared to passive recovery.

Stretching

Stretching plays a positive role in the successful recovery. "*The most common type is static stretching. Here the specific position is held with the muscle on tension to a point of a stretching sensation and repeated"*[18]. Stretching for recovery is prescribed to align collagen fibers during healing tired muscle. For the speed runners static stretching is the best type for recovery. It can be performed passively by a partner, or actively by the runner. Stretching activates query muscles as: the leg muscles-inner and outer thighs, hips, hamstrings, calves and quadriceps.

Hydrotherapy

The runner's body has an important response to water immersion. The body loses an important part of weight and the motions become easier. The water immersion effects reduce muscle soreness and perception of fatigue. In the same time swim recovery session reduces lactate concentration in speed runners. They used to have swim recovery session once a week in preparing period and less in competition sessions.

Massage

Massage is a widely used recovery strategy among athletes. Massage effects means muscle soreness and relaxed muscle. Massage increases blood flow. Wiltshire et al. [19] reported that massage actually impaired blood flow and lactate removal. Track and field speed runners used massage recovery after each training session. The most massaged are lower limbs and back, and upper limbs.

Conclusions

Optimal recovery from training and competition may provide numerous benefits

for track and field speed runner performance.
The most efficiency recovery strategy for speed runner is passive recovery, sleep.
The role of active recovery and massage in reducing lactate concentrations after exercise may be important factors for speed runners. Adequate nutrition maximizes recovery and reduces fatigue from exercise in track and field speed runners.

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