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Role of fluids in sports performance enhancement and recovery strategies

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Abstract

Hydration is crucial for sports performance and recuperation, as it strengthens muscles, increases endurance, and improves cognitive performance. It enhances muscle recovery post-exercise and reduces discomfort. Drinking fluids before, during, and after exercise, consuming hydrating foods, and staying hydrated throughout the day ensure optimal performance. Fluids play a crucial role in regulating body temperature, blood volume, and cardiovascular efficiency during exercise. They improve blood flow and oxygen supply to muscles, increasing endurance and performance. Dehydration can affect performance by causing muscle cramping and reducing energy production. Sports performance relies on cognitive abilities, which can be negatively impacted by even minor dehydration.

Keywords: Hydration, cardiovascular efficiency, cognitive abilities

Introduction

The key to achieve optimal athletic performance is a question that sports dietitians are frequently asked. Though many variables are involved, one essential component that should not be disregarded is staying hydrated. Staying properly hydrated is essential for optimising athletic performance and goes beyond simply slake your thirst. In this article it will be explored that why athletes need to be hydrated and how it affects their performance on the pitch and general well-being.

An athlete is more likely to have a musculoskeletal injury when they are hypohydrated because it puts stress on their cardiovascular system and lowers their physical capacity (Berning and Steen, 1991) ^[1].

The amount and kind of fluids consumed by athletes before, during, and after exercise have an impact on their performance. Both consuming too little or too much fluids might be harmful to your health. The adage "drink before the thirst hits" has historically been used to advise athletes. But this can also raise the risk of hyponatremia, sometimes known as "water intoxication," which has already killed recreational athletes (triathletes and marathon runners) in severe circumstances (Hew-Butler *et al*, 2015) ^[5].

Fluids are essential for both athletic performance and recuperation. Thermoregulation, cardiovascular health, muscle metabolism, and cognitive function are all aided by adequate hydration and are essential for peak athletic performance. Adopting efficient hydration practices prior to, during, and following exercise can greatly improve performance and hasten recovery, assisting athletes in reaching their maximum potential.

Fluids are essential for regulating body temperature. The body generates heat during exercising, and sweating helps to cool it down. Adequate hydration aids in the cooling process, preventing overheating. Hence, fluids play an important role in thermoregulation. Hydration levels have a direct impact on blood volume and cardiovascular efficiency. Proper hydration improves blood flow and oxygen supply to muscles, hence increasing endurance and performance. Water is necessary for all biological processes, such as the metabolism of energy and the contraction of muscles. Dehydration can affect performance by causing muscle cramping and a reduction in the production of energy. While muscle tiredness and neuromuscular control are important factors, dehydration may make one more susceptible to cramping in the muscles (Bergeron, 2008) ^[8].

Sports performance depends on cognitive abilities including coordination, focus, and decision-making, all of which can be negatively impacted by even minor dehydration.

Recovery is significantly impacted by fluids. When a person's body is dehydrated by more than 2%, their ability to execute an exercise can be compromised. Elevated levels of dehydration intensify the adverse reactions (Casa D J *et al*, 2005) [2].

Heart Rate Variability is significantly impacted by hydration (HRV). HRV is a gauge of overall health and recuperation as well as the body's capacity to adjust to stress. Dehydration causes the heart to produce more energy with each beat, which raises the heart rate in an attempt to make up for the lost water. Further reductions in HRV may result from our sympathetic nervous system (SNS) becoming more active and producing higher levels of stress chemicals like cortisol and adrenaline when we are thirsty. Since a result, maintaining proper hydration is crucial for a healthy heart rate variability (HRV) since it lowers the risk of dehydration-related cardiac rhythm abnormalities and supports normal SNS function.

Performance hinges on staying hydrated while and not just after an athlete and their trainer participate in a game, tournament, or session. Dehydration increases the chance of headaches, cramps, and more severe side effects like heat stroke or other heat-related illnesses.

Track and field athletes are particularly vulnerable to the hazards of dehydration and the possible setbacks to their performance because of the extremely varied nature of their fluid needs resulting from the variety of events, training regimens, and individual variances among competitors (Casa *et al.*, 2019) [7].

Depending on body mass, perspiration rate, surroundings, and tolerance, specific advice for each athlete is different. Strength and conditioning specialists, coaches, athletes, and trainers must comprehend the significance of maintaining appropriate nutrition and hydration, as well as the essential elements of hydration education, in order to successfully implement a hydration protocol (Casa *et al*, 2000) [3].

Sports Hydration Techniques:

1. **Hydration prior to exercise:** Before beginning any physical exercise, athletes should begin to hydrate. To guarantee sufficient fluid levels, drink 16-20 ounces of water two to three hours before working out, and another 8 ounces 20 to 30 minutes beforehand.
2. **Hydration during exercise:** Athletes should consume 7-10 ounces of water every 10-20 minutes while exercising, according to the American Council on Exercise. Sports drinks with electrolytes and carbohydrates may help replace lost nutrients and sustain energy levels during strenuous or prolonged activity.
3. **Rehydrating after exercise:** It's important to replenish the fluids lost through perspiration following an exercise or competition. Rehydrating effectively can be facilitated by consuming 20-24 ounces of water for each pound lost during activity. Post-exercise diet that contains carbohydrates and an electrolyte supply can help speed up recovery even further.

When and how much fluid?

By rehydrating with liquids after exercise, the athlete can avoid the performance decline brought on by dehydration.

The individual and the sport determine how much fluid and when to drink it. These are some pointers:

1. Exercise should always begin with adequate hydration; this will reduce the chance of dehydration during physical activity. Being too hydrated has no negative effects on performance because it increases urine and makes you feel bloated before exercise.
2. Create a strategy for drinking while working out based on your personal rate of perspiration.
3. Check your weight change right after exercise to determine your final fluid deficit. You will continue to lose fluids during recovery via perspiration and urine losses, therefore during the next two to six hours, aim to restore 125-1500% of this fluid deficit. To properly rehydrate, you would need to drink 1250-1500 mL if you lost 1 kg, or 1000 ml. To accomplish this, have fluids with your post-meal recovery snacks.
4. The chances and problems for maintaining the right level of hydration vary throughout sports. Formal breaks with substitutions and time-outs provide opportunities for drinking during team and racquet sports. Drinking while playing certain individual sports is mandatory. To maximise the benefits of your fluid consumption with the least amount of hassle or discomfort, be astute and put tactics into effect. Try using hands-free drink pouches or specialised squeeze bottles, if possible.
5. A good predictor of the level of hydration when exercising is not the level of thirst. Before experiencing thirst, there is typically a considerable fluid loss. The hunger will be quenched when the athlete drink, long before these losses are completely made up.

What is the ideal beverage to consume?

With so many drink alternatives at disposal, the athlete has to decide which is ideal for him/her. When it comes to replacing lost fluids, plain water works well, especially for brief, low-intensity activities. For high-intensity and endurance sports, however, performance can be improved if electrolytes and carbohydrates are added to water, as in a sports drink.

Drinks that taste well will be consumed by athletes in greater quantities, which could help them fulfil fluid targets during competition or rehydrate more efficiently. Fluid containing carbohydrates improves flavour and supplies muscle energy. One benefit that sports drinks may have over regular water is this. Electrolytes lost through perspiration, including salt, must be replenished both during and after extended periods of physical activity.

Sweating can lose a significant amount of salt (sodium chloride) after extended physical exertion (Sharp R L, 2007) [6]. Sweating loses essential electrolytes, like salt, which must be replenished both during and after intense activity. Because sodium increases the thirst mechanism, increases the absorption of water and carbohydrates in the intestines, and decreases the amount of urine generated after exercise, sodium-containing fluids improve fluid consumption. Naturally, foods that are taken along with fluids after exercise may contain salt.

By encouraging more water retention and stoking thirst, maintaining electrolyte balance-especially with regard to sodium has been shown to enhance hydration and performance. This is because maintaining electrolyte

balance is a more effective way to stay hydrated than simply drinking water (Del Cosco *et al*, 2016) ^[4].

A rising range of drinks with various components, including caffeine, are available on the market. The World Anti-Doping Agency has lifted its ban on caffeine. It is doubtful that consuming modest to moderate quantities of caffeine (75-200 mg) will affect one's level of hydration when exercising, although it can aid maintain performance. But athletes often take caffeine on an as-needed basis, and they might not be aware of the potentially harmful side effects of this behaviour. Make sure you talk about caffeine use with your sports scientist or dietician and take into account each person's unique caffeine tolerance.

Alcohol will hinder essential recovery processes and may make it more difficult for the athlete to properly rehydrate, so it is not a good choice to choose a fluid right after exercise. Should you decide to have alcohol after working out, make sure you take care of your post-exercise recovery needs first (replace fluids, replenish your glycogen storage, and eat some protein to help rebuild your muscles). Only then can you enjoy an alcoholic beverage in moderation.

Hydration is essential for both recuperation and sports performance. Maintaining adequate water can strengthen muscles, increase endurance, and improve cognitive performance. Additionally, it can enhance muscle recovery following exercise and lessen discomfort in the muscles. Drink fluids before, during, and after exercise, pay attention to the colour of your urine, take the temperature and humidity into consideration, and stay hydrated. To stay hydrated when recovering, eat hydrating foods and stay hydrated with water throughout the day. You can make sure that your body is operating at its peak and that you are capable of giving your best effort by making sure you are drinking enough water.

References

1. Berning J, Steen SN. Sports Nutrition for the Nineties: The Health Professional's Handbook. Gaithersburg (MD): Aspen Publishers Inc; 1991. p. 153-74.
2. Casa DJ, Clarkson PM, Roberts WO. American College of Sports Medicine Roundtable on Hydration and Physical Activity: Consensus Statements. *Curr Sports Med Rep.* 2005;4:115-27.
3. Casa DJ, Armstrong LE, Hillman SK, Montain SJ, Reiff RV, Rich BS, *et al*. National Athletic Trainers' Association position statement: Fluid replacement for athletes. *J Athl Train.* 2000;35:212-24.
4. Del Coso J, González-Millán C, Salinero JJ, Abián-Vicén J, Areces F, Lledó M, *et al*. Effects of oral salt supplementation on physical performance during a half-ironman: A randomized controlled trial. *Scand J Med Sci Sports.* 2016;26(2):156-64.
5. Hew-Butler T, Rosner MH, Fowkes-Godek S, Dugas JP, Hoffman MD, Lewis DP, *et al*. Statement of the third international exercise-associated hyponatremia consensus development conference, Carlsbad, California, 2015. *Clin J Sport Med.* 2015;25:303-20.
6. Sharp RL. Role of sodium in fluid homeostasis with exercise. *J Am Coll Nutr.* 2007;26(5):542S-8S.
7. Osborne C, Warner-Doe H, Lawson J. Who gets a CASA? Selective characteristics of children appointed a CASA advocate. *Children and youth services review.* 2019 Mar 1;98:65-71.

8. Bergeron BS. Enacting a culturally responsive curriculum in a novice teacher's classroom: Encountering disequilibrium. *Urban Education.* 2008 Jan;43(1):4-28.