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USE OF FLUIDS BEFORE, DURING AND AFTER EXERCISE

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ABSTRACT :

Fluids make nutritional products to hydrate fuel and replenish you. Water is most important nutrient for human body. Abnormal decrease in body water will make you dehydrated which will result in decreased quality of performane. It is important for the athletes to start exercise in a well hydrated state. One way to check the level of hydration before exercise is to monitor urine volume and color. If urine volume is small and the color of urine is dark, the recommdation is to drink other 3-5 ml/kg body weight about 2 hour before exercise (sawka2007). The goal of drinking fluids during exercise is to maintain plasma volume and electrolytes prevent abnormal elevation in heart rate and core body temperature and provide fuel to the working muscle. The goal of post exercise rehydration is to replace the water and electrolytes lost during exercise. Full restoration of fluid may take between 4 and 24 hour (greenleaf1992) depending on the degree of dehydration that occurred before or during exercise. Drinking fluid before, during and after exercise is important to maintain and replace fluids lost in sweat. Fluids may reduce the risk of dehydration heat stress, maintain normal muscle function, and prevent performance decreases due to dehydration.

KEYWORDS : *hydration, dehydration, euhydration etc.*

INTRODUCTION

Water is your body's principal chemical component and makes up about 60 percent of your body weight. Your body depends on water to survive.

1.Every cell, tissue and organ in your body needs water to work.
2.Watergets rid of wastes through urination, perspiration and bowel movements
3.Keeps your temperature normal.
3.Lubricates and cushions joints

Lack of water can lead to dehydration — a condition that occurs when you don't have enough water in your body to carry out normal functions. Even mild dehydration can drain your energy and make you tired. Especially during a physical activity (low or moderate intensity exercise) a tremendous amount of demand is put on the different body systems and any loss of fluids will lead to dramatic influence to your performance.

Fluid contains electrolytes and minerals including sodium, chloride, magnesium, potassium & calcium will be just ideal for any physically demanding activity. A faster fluid empties from stomach is more advantageous for athletes to keep the body in euhydrated state. Under normal conditions daily

water losses come from urine, sweat and respiration. Significant reduction of fluid in these Ares can have a negative effect on performance and cognitive function due to dehydration.

There is little doubt that performance during prolonged, continuous exercise in the heat is impaired by levels of dehydration >or= -2% body mass, and there is some evidence that lower levels of dehydration can also impair performance even during relatively short-duration, intermittent exercise. Although additional research is needed to more fully understand low-level dehydration's effects on physical performance, one can generalize that when performance is at stake, it is better to be well-hydrated than dehydrated. This generalization holds true in the occupational, military, and sports settings.(Bob murray,2007)

Three studies in particular spanning 1944 to 2007 gave a detailed and exhausted knowledge about the necessity of proper and timely fluid intake. The experimental designs and performance tasks used in these studies are markedly different, but the uniformity of the results reflects the current consensus of scientific literature: dehydration incurred before and during sustained exercise often impairs physical performance.(American college of sports medicine,burke,2007)

FLUID NEEDS BEFORE EXERCISE

It is important that players begin exercise in a well hydrated state. Athletes in weight class sports and people training or racing in environments to which they have not yet acclimatized are at greatest risk to begin exercise in a dehydrated state. The recommdation according to ACSM is that athletes and active individuals consume 5-7 ml/kg body weight 4 hour before exercise. One way to check the level of hydration before exercise is to monitor urine volume and color. If urine volume is small and the color of urine is dark, the recommdation is to drink other 3-5 ml/kg body weight about 2 hour before exercise (sawka2007). In hot weather it may be wise to add 250-500 ml prior to exercise consuming fluids containing sodium 20-25 mmol/L before exercise or having a small salted snacks such as pretzels will also help stimulate thrust and retain consume fluids (sawka,2007).

it is critical to note that sodium should be included in fluids consumed during exercise lasting longer than 2 h or by individuals during any event that stimulates heavy sodium loss (more than 3–4 g of sodium)(Edward f coyle,2017

Pre-workout water intake: If we start our workout in a dehydrated state, it will adversely affect our performance. We would feel low on energy, stiff muscles and also get cramped easily. That is essential because water forms a major part of our muscles and also helps in keeping the joints well lubricated. The water intake must start well 2 to 3 hours before a workout or any sporting activity. The water intake also depends upon the intensity of activity aIf a person sweats too much or works out in scorching heat, he must have at least 500-600 ml of water 2-3 hours prior to exercise. This will ensure good hydration status. If the workout lasts for a longer time, like over an hour, then it would be advisable to consume a carbohydrate drink (up to 8% concentration). This will help to prevent fatigue and dehydrationnd the individual's own body condition.

FLUID NEEDS DURING EXERCISE

The goal of drinking fluids during exercise is to maintain plasma volume and electrolytes prevent abnormal elevation in heart rate and core body temperature and provide fuel to the working muscle. The most serious effect of exercise induced dehydration is the abnormal rise in core body temperature 40° due to inability to dissipate heat. Females have lower sweating rates than males , primarily due to the smaller body size and lower metabolic rates during engagement in a given exercise task (sawka 1983). Water balance changes due to fluid intake: although we would expect fluid intake to improve the total body water pool regardless of when it is consumed during exercise. If the fluid is consumed late during exercise or if hyper tonic fluid is ingested, both of which can slow absorption then fluid ingestion may not immediately improve the total body water pool. Fluid replacement during

exercising lasting longer than 60 min should be common practice for most athlete and fluid volume should be adjusted to individual requirements.

Water intake during workout: The consumption here depends on the duration of the activity. If the exercise or sports event lasts for less than an hour, then there won't be a chance to ingest too much fluid within the duration of the activity. Here, we can consume 1 small glass (180-200 ml) of plain cold water every 15-20 minutes. Cold water would make a better choice over water at room temperature because cold water has a faster gastric emptying time. Also, if the person has consumed enough dietary carbohydrates, the glycogen stores in his muscles and liver will suffice for providing energy to sustain the activity. In the case of a high-intensity workout or sports event (marathon, a game of football, etc) that goes for over 1 hour, the individual is at a risk of decreased performance due to dehydration, fatigue and hypoglycemia. Their fluid intake must include carbohydrates and electrolytes. Carbohydrate will prevent hypoglycemia. The electrolytes like sodium and chloride need to be replenished due to sweating. Also, sodium will help in water retention.

Sodium loss during physical activity:

Sodium loss occurs in both elite and recreational athletes during endurance exercise. This loss is exaggerated during exercise in hot environments and is affected by training status and heat acclimatization. Moreover, during exercise, most extracellular fluid volume loss is a direct function of the sweat sodium loss (Nose et al., 1988b). The amount of sodium that is lost depends on the sweating rate and the concentration of sodium in the sweat. Because sweating is related to genetic factors, diet, body weight, heat acclimatization and other physiological traits, there is a wide variation in the amount of sweating and sodium loss across individuals. This variability across individuals persists even when the intensity and type of activity are the same and are performed in the same environmental conditions. However, some sodium will be lost during endurance exercise in all athletes and the extent of the loss determines how much sodium needs to be replaced (Sawka et al., 2007). While some of the sodium released in sweat is reabsorbed by the sweat gland, sweat sodium loss during exercise (especially in the heat) occurs more rapidly than it can be reabsorbed, so much of the sodium in sweat is lost. Heat acclimatization improves sodium and chloride reabsorption so heat acclimatized individuals usually have a more dilute sweat for a given sweating rate (Buono et al., 2007).

FLUID NEEDS AFTER EXERCISE

The goal of post exercise rehydration is to replace the water and electrolytes lost during exercise. Full restoration of fluid may take between 4 and 24 hours (Greenleaf1992) depending on the degree of dehydration that occurred before or during exercise. It is believed that typically sweat sodium losses range from 20-80 mmol/l in exercising humans (Armstrong 2007) . Spacing fluid intake over several hours of recovery appears to be more effective that consuming a large amount of fluid immediately after exercise (susan Shirreffs 2007).

Post-workout water intake: After exercise or any sports event, we need to pay good attention to eating and drinking right. There arises a need to replenish the carbohydrates, salts and water that are lost during the activity. Immediately after the exercise/event, for the next few hours work on improving your hydration status. Do not start with any new activity without attaining good hydration levels. Replenishing the salt reserves must be your top priority as sodium has good fluid retention capacity which keeps up the urge to drink water. Fluid consumption, containing carbohydrates, salts and water, must continue up to 5-6 hours after the activity. The best way to ensure that you are hydrating yourself well is, to weigh yourself before and after the exercise/event and drink at least 400-500 ml of water for every 1 pound lost. Fluid intake needs to be planned and distributed at regular intervals.It would always be better to carry a bottle of water with you wherever you go and sip on it regularly. Many times, your performance in workouts and sports can be improved only with optimum hydration.

SUMMARY

Drinking fluid before, during and after exercise is important to maintain and replace fluids lost in sweat. Fluids may reduce the risk of dehydration heat stress, maintain normal muscle function, and prevent performance decreases due to dehydration. So always start exercise well hydrated. Check your weight before and after exercise according to loss of fluid through sweat replaceby 125-150% of these fluids over next 2-6 hours.Whether you're a serious athlete or simply exercise for recreation, it's important to stay hydrated. Good hydration means getting the right amount of water before, during, and after exercise. Water regulates your body temperature and lubricates your joints. It helps transport nutrients to give you energy and keep you healthy. If you're not hydrated, your body can't perform at its highest level. You may feel tired, have muscle cramps, dizziness, or other serious symptoms

Sodium intake is critical in maintaining the electrolyte balance of the body. A person undertaking regular exercise, any fluid deficit that is incurred during one exercise session can potentially compromise the next exercise session if adequate fluid replacement does not occur. Fluid replacement after exercise can, therefore, frequently be thought of as hydration before the next exercise bout. The importance of ensuring euhydration before exercise and the potential benefits of temporary hyperhydration with sodium salts or glycerol solutions are also important issues. Post-exercise restoration of fluid balance after sweat-induced dehydration avoids the detrimental effects of a body water deficit on physiological function and subsequent exercise performance. For effective restoration of fluid balance, the consumption of a volume of fluid in excess of the sweat loss and replacement of electrolyte, particularly sodium, losses are essential. Intravenous fluid replacement after exercise has been investigated to a lesser extent and its role for fluid replacement in the dehydrated but otherwise well athlete remains equivocal.

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