

Climate Change and Human & Environmental Health Climate

Renu Mourya¹

¹Asst. Prof. Physical Education S.K.B.B. Govt. P.G. College Harakh Barabanki (U.P.) India

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Abstract

Physical activities play a very important role in the development of an individual's health but these physical activities are affected by climatic conditions also. If we ignored climatic conditions at the time of workout then it gives a negative effect to our health. The Olympic Games have drawn attention to a number of environmental influences on sports performance. During the time of the Summer Olympics it is usually hot and/or humid. On the other hand, the Winter Olympics invariably call for protection against the cold. During training coaches should monitor their athletes carefully for signs of heat intolerance or cooling conditions. Risks should not be taken with them in hot, humid or extremely cool conditions. Exercising in hot, humid conditions when the body is not accustomed to it can place the body under great stress. Athletes travelling overseas or to different climates should consider heat acclimatization an important preparation strategy.

Keywords- Climate Change, Human, Environmental Health

Introduction

Physical activities play a very important role in the development of an individual's health but these physical activities are affected by climatic conditions also. Our intensity of physical activity depends upon the climatic conditions. If we ignored climatic conditions at the time of workout then it gives a negative effect to our health. The Olympic Games have drawn attention to a number of environmental influences on sports performance. During the time of the Summer Olympics it is usually hot and/or humid. On the other hand, the Winter Olympics invariably call for protection against the cold. Exercising in hot, humid conditions when the body is not accustomed to it can place the body under great stress. Athletes travelling overseas or to different climates should consider heat acclimatization an important preparation strategy. It is the purpose of this study to describe the physiological responses to a number of environmental conditions and to offer considerations that could be given during the performance of sporting activities.

Heat:- During exercise the body produces a great deal of heat. In extreme circumstances this can elevate its core temperature from 37° C to beyond 40° C. When the surrounding air is cool heat can be lost from the body by the process of radiation, convection, conduction, and evaporation. As the surrounding temperature increases it becomes more and more difficult to lose heat by radiation, convection, and conduction. Hence, the predominant source of heat loss in warm to hot conditions is from the evaporation of sweat on the skin surface. There are a number of factors that must be considered before individuals are exposed to work in hot conditions.

The Climate:- Other than air temperature, both humidity and radiant heat should be assessed before athletes engage in hard training or competition in hot weather conditions. Coaches should be aware of the potential negative effects on athletes. When it exceeds 28° C the coach should abandon vigorous activities for poorly conditioned and unacclimatized individuals and be wary of signs of heat intolerance in others.

Characteristics of the Individual:- There are certain individuals who have a low tolerance to heat and need careful supervision by coaches. Those with heavier builds possess a lower ratio between skin surface area and

body mass than those with more linear builds. This is a disadvantage for heat removal. High levels of body fat also encourage heat storage. Fat tissue has a lower specific heat than lean tissue and therefore, absorbs heat more readily.

Heat Acclimatization:- It has been shown that physical training in cool conditions improves tolerance to hot conditions. However, full adaptation to heat can only be achieved by actually working in hot conditions. The adjustment is very rapid and is achievable in about 7 to 10 days if regular daily exercise for 90 minutes is undertaken. Heat acclimatization expands the blood volume, which supports an increased capacity and precision of sweating.

Clothing:- During exercise in hot conditions, it is recommended that participants wear light-collared clothing made from open-weave natural fibers (e.g., cotton, wool). As much of the skin as possible should be exposed to the air to maximize the evaporation of sweat. Clothing made from synthetic fibers, such as nylon and polyesters, offers more resistance to heat removal and, in time, becomes uncomfortable.

Fluid Replacement:- When fluid losses exceed 2 percent of body weight prior to exercising, significant endurance performance deterioration occurs. It is wise to drink (hydrate) before exercising so that no dehydration occurs.

Cold:- In cold climates the athlete continually tries to prevent heat loss and a fall in the core body temperature. A cooled state is referred to as 'hypothermia' or 'exposure'. In a fatigued person its symptoms are poor control of movement, disorientation, and poor judgment and reasoning. The two ways to cope with this problem are to produce more heat or reduce the amount being lost.

Increased Heat Production:- Extra heat can be produced either by shivering or by exercising. Shivering raises the resting metabolism about fourfold but in the process interferes with the expression of skill. Depending on the endurance fitness level of the individual, metabolism can be elevated twelve- or fifteen fold during intensive exercise. Fitness is necessary to maintain a high work rate and heat production during endurance sports.

Decreased Heat Loss:- There are several physical avenues for heat loss which must be considered if an athlete is to remain warm. Radiation is the physical action whereby heat is radiated from the body to nearby cooler objects. Curling the body into a tuck and reducing the exposed surface area can minimize heat lost. Such a response is common when resting in cold conditions. Limiting the blood flow through the skin also can reduce heat loss by radiation. This is the first line of defiance against cold and is managed by reflex constriction of the blood vessels supplying the skin. In extreme conditions, frostbite injuries can be sustained. Acclimatization to cold conditions promotes some improvements in local blood flow and enhances the capabilities of the extremities to perform with skill and precision. It is important not to overprotect the hands and feet against the cold as the body will perceive itself to be very warm and not invoke the physiological temperature regulation processes that prevent a fall in core body temperature. It is better to insulate the trunk rather than the extremities.

Conclusion:- During training coaches should monitor their athletes carefully for signs of heat intolerance or cooling conditions. Risks should not be taken with them in hot, humid or extremely cool conditions. The procedure of adding extra layers of clothing while training during the winter months has been tested as a means of promoting heat acclimatization. On hot days, fluid should be consumed before, during, and after training to maintain temperature regulation. This maintains the stability of circulation that is so important for endurance efforts. Water is the primary requirement and, in most circumstances, is the ideal replacement fluid.

Properly planned physical training program according to the conditions of climate helps to improve the performance of an athlete.

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