

Cold Weather Provocation of Exercise-Induced Respiratory Issues

Exercise-induced bronchospasm (EIB) and exercise-induced asthma (EIA) are sometimes referred to interchangeably. The definition of EIB is the acute, transient occurrence of the airway narrowing provoked by and during exercise and often 5-10 minutes after the exercise has stopped (Stack & Hakemi, 2011). EIB is also defined as a 10% or greater "decline in forced expiratory volume in the first second of expiration (FEV₁) after exercise provocation" (Stack & Hakemi, 2011, p. 26). Stack and Hakemi (2011) noted that EIB is more descriptive of the bronchospasmodic component, whereas EIA includes the inflammatory response and other patient symptoms such as cough, tightness of the chest, wheezing, and shortness of breath (Stack & Hakemi, 2011).

Conditions involved in provoking occurrences of EIB and EIA are multifaceted and still not fully understood. The thermal hypothesis proposed that airway cooling (due to increased ventilation from exercise) which is followed by quick rewarming can lead to hyperaemia and edema of airway walls causing temporary airway narrowing, bronchoconstriction (Bussotti, Di Marco, & Marchese, 2014; Carlsen, 2012; Stack & Hakemi, 2011). The osmosis hypothesis proposed that water loss and dehydration of the airways was the trigger for an EIB/EIA event (Stack & Hakemi, 2011). A combination of these two hypothesis may also be possible.

Cold weather (especially with wind and low humidity) has been recognized as a contributing factor to an EIB/EIA event, and significant proportion of cold weather athletes are affected by EIB/EIA especially cross-country skiing and biathlon athletes (Butcher, 2006; Carey, Aase, & Pliego, 2010; Pohjantähti, Laitinen, & Parkkari, 2005). It is important to recognize because pharmacologic interventions may show up in drug testing, although there are other non-pharmacologic aids like face masks (or maybe using a scarf) that can help as well.

Although I am not working in the health and fitness industry (and cannot speak of experience training others with EIB/EIA), this topic is significant to me because I shoot action photos and have shot under extreme conditions similar to a biathlon athlete. I was invited twice to shoot an international martial arts and stage combat conference up in Banff National Park. The conference lasted about 8 days in the dead of winter, and I was working around the clock. I had to run with my gear from various locations in the snow, immediately get a few shots, and run to the next location (indoors and outdoors). One might call it the "photographer's iditarod". The dryness and cold really irritated my lungs (as well as change in temperature between indoors and outdoors), and it was difficult to control the coughing spasms. The quality of the cold air was much more difficult to deal with than the altitude.

References

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