ABSTRACTS OF CURRENT LITERATURE

ANNALS OF EMERGENCY MEDICINE

A Randomized, Double-Blind, Placebo-Controlled Trial of a Highly Purified Equine F(ab)₂ Antibody Black Widow Spider Antivenom

Black widow spider bites can cause a variety of symptoms collectively known as latrodectism. Common symptoms include pain, agitation, anxiety, and autonomic dysfunction such as tachycardia and diaphoresis. The equine derived black widow spider antivenom was initially licensed in the United States in 1936, but no formal clinical trials have been conducted. The investigators performed a randomized, double blind, placebo controlled clinical trial to compare the effects of placebo and black widow spider antivenom. The primary outcome was the difference in pretreatment and post treatment pain, assessed by the visual analog scale; secondary outcomes were treatment failure and clinically relevant decrease in pain.

Among the 24 subjects, the antivenom group had a shorter median time to clinically significant pain reduction compared with placebo (30 vs 90 minutes). Although the antivenom group had a greater overall decrease in pain, this difference was not statistically significant. Additionally, there were 7 treatment failures in the placebo group and only 3 in the antivenom group. No serious adverse events or deaths were observed in either group. The authors of this report conclude that although overall pain reduction between placebo and antivenom was similar, the antivenom reduced pain more rapidly than placebo did. Limitations of the study include small sample size and difficulty identifying true black widow bite. The investigators recognize the need for further studies analyzing the costs, risks, and long term outcomes of black widow antivenom administration.

(*Ann Emerg Med.* 2013 Feb 1 [Epub ahead of print]) RC Dart, G Bogdan, K Heard, et al.

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BMJ

Identifying the Lowest Effective Dose of Acetazolamide for the Prophylaxis of Acute Mountain Sickness: Systematic Review and Meta Analysis

It has been well described that acetazolamide, a carbonic anhydrase inhibitor, can be used as prophylaxis for acute mountain sickness (AMS) with a number needed to treat (NNT) to prevent 1 case of AMS ranging from 3 to 7. This medication, however, can have side effects of paresthesias, dysgeusia, polyuria, and rash. Therefore, determining a minimum effective

prophylactic dose can decrease adverse effects and improve patient compliance.

The investigators performed a systematic review and meta analysis of 11 randomized controlled trials using 250 mg, 500 mg, or 750 mg daily doses vs placebo at elevations greater than 3,000 m. It was determined that although all doses were more effective than placebo (combined odds ratio 0.36, with 95% CI: 0.28 to 0.46), the lowest effective dose was 250 mg daily with a NNT of 6. This was a significantly lower dose than the 750 mg (NNT = 3) minimum effective dose published in a prior review of the topic in 2000.

The study is limited by the inability to control between the selected studies for elevation, ascent rate, partial acclimatization before enrollment, or other potential confounders that would lead to differential AMS incidence. Furthermore, AMS severity was not analyzed. The authors noted that the lowest effective dose was the lowest dose studied, identifying a need to investigate lower acetazolamide doses.

(*BMJ.* 2012) WV Low, AJ Avery, V Gupta, et al.

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INTERNATIONAL JOURNAL OF SPORTS MEDICINE

Effects of Exercise and Hypoxia on Heart Rate Variability and Acute Mountain Sickness

Despite extensive research in the field of acute mountain sickness, the pathophysiology and mechanisms that cause AMS are largely unknown. One common finding is a reduction of heart rate variability (HRV), thought to be secondary to a sympathetic predominance with suppression of vagal activity. This randomized crossover study examined the effect of hypoxia and exercise on the autonomic control of the heart and the prevalence of AMS. The authors of the study hypothesized that the additional stress of moderate exercise would cause a reduction of HRV and a corresponding exacerbation of AMS symptoms.

Twenty participants were placed in a normobaric hypoxic chamber (Fio₂ of 11%) to simulate the partial pressure of oxygen at 5500 m. Active exercise was defined as three 30 minute cycle ergometer sessions at 50% of each individual participant's predetermined maximum. The primary outcomes were HRV and AMS symptoms defined by the Lake Louise Score. The investigators found a decrease in HRV in both passive and exercise groups, but with no statistical difference between the 2 groups. Further, HRV did not correlate with the incidence of AMS. Although exercise did not significantly increase the