

Title: THE EFFECTS OF MICROCLIMATE COOLING ON TOTAL BODY SWEAT RATE AND VASOACTIVE INTESTINAL PEPTIDE.

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Abstract:

The purpose of this study was to investigate the effects of repeated high heat exposure with use of microclimate cooling (Ice Vest) on sweat rate (SWR) and vasoactive Intestinal peptide (VIP) production. U.S. Navy engine room personnel (N-7) volunteered to stand a simulated 4-hr engine room watch (EW) with mean ambient temperatures (°C) of globe=45.5, dry bulb=43.3, wet bulb=32.2, relative humidity=46%, and partial vapor pressure=31mmHg.

Subjects were tested on 4 consecutive days alternating Ice Vest (Ice) and No Ice Vest (No-Ice) conditions (2 days each). VIP serum levels were obtained from blood samples collected prior to entering and exiting the heat exposure. Total body sweat rates were determined by pre/post nude body weight and corrected for fluid exchanges. Skin and forearm blood flow (laser doppler and plethysmography, respectively) were sampled at 3 intervals during the EW (hours 1,2,3); heart rate (HR), rectal (Tre) and skin temperatures (Tsk) were recorded continuously. Post-VIP (67%), SWR (.42 l/hr), and HR (94 bpm) results were all significantly higher in the No-Ice condition compared to the Ice condition results (5.4%, .21 l/hr and 86.8 bpm, respectively. Mean skin and forearm blood flow values were slightly higher in the No-Ice vs. Ice conditions (7% and 15% respectively).

These results support the hypothesis that VIP production and sweat rate are linked in the thermoregulatory process and indicate that microclimate cooling can reduce thermal strain when working in high heat.

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