Simultaneous Comparison of the Personal Uv Exposure of Two Human Groups At Different Altitudes

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Abstract

A simultaneous comparison of human exposure to solar ultraviolet radiation at two locations was performed to study the effect of environmental factors and human attitudes on personal ultraviolet exposure. The study took place on 29 October 1996 in Toowoomba (27.5'S, 151.9'E) and Brisbane (27.4'S, 153.1'E), Queensland, Australia. From the data collected by calibrated ambient ultraviolet monitoring stations located in Toowoomba and Brisbane, Toowoomba received 68% more UVA (320 - 400 nm) and 61% more UVB (280 - 320 nm) than Brisbane from 07:00 to 10:00 Australian Eastern Standard Time (EST). From 10:00 to 17:00 EST Toowoomba received 5% more UVA and 20% less UVB than Brisbane. High ambient ultraviolet levels recorded by ultraviolet stations were reinforced by measurement of the personal ultraviolet exposure of human subjects wearing polysulfone dosimeters. Contrary to the common belief that the ultraviolet exposure to the human body is higher near the beach (i.e., coastal areas) than the inland area, the average erythemal weighted ultraviolet exposure on the chest and shoulder of each subject in the inland city of Toowoomba (127 km to the west of Brisbane) was 30% higher than in the coastal city of Brisbane from 07:00 to 17:00 EST. Evidence is also presented to suggest a relationship between altitude, climatic conditions, the human attitude, and the level of personal exposure to ultraviolet radiation.

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