INTRODUCTION

It has been reported that the more pigmented an individual is the lower the risk that he will be adversely affected by ultraviolet (UV) radiation. This means that pigmented people are at a lower risk to develop an erythema reaction to UV (Pathak and Fitzpatrick 1982, Hawk and Parrish 1982) and also at a lower risk to skin cancer (Urbach 1982). It has also been shown that heavily pigmented epidermis attenuates UV radiation more effectively than Caucasian epidermis (Everett et al. 1966, Kaidbey et al. 1979, Pathak and Fitzpatrick 1974) stated that black epidermis transmitted 2 to 5 times less 300 nm radiation than Caucasian epidermis. It has been concluded that melanin is an effective filter of UV radiation that darker peoples possess. We have looked at (a) the pigment level of a Mediterranean skin type (b) MED to monochromatic UVB wavelengths (c) MED to UVB of psoriatic patients (d) the absorption of melanin in skin and (e) skin cancer statistics. This we have done in order to assess the protective capacity of melanin to UV radiation. These results were then compared to similar studies on Caucasian subjects.

MATERIALS AND METHODS

A) Pigment level. The pigment level of 314 volunteers was measured using a technique previously described (Kollias and Baqer 1986) on a scale of zero to nine. Of these 250 were patients and 64 normal volunteers. All volunteers were informed of the nature of the experiment and their consent was obtained.

B) Erythema effectiveness of 295, 305, 315 nm. 24 healthy volunteers of skin type common to the area of Kuwait were tested. All irradiations were on the upper back with the volunteers in a sitting position. Doses were given at 20% increments, the irradiated area was 6 mm in diameter. The UV radiation was produced by a Applied Photophysics Clinical Photoirradiator.
(UV-90) at 295, 305, 315 nm with a bandpass of 5 nm. The output power of this instrument was 2.1 mW/cm² at 295 nm, 2.4 at 305 nm, and 2.8 at 315 nm. The reaction was assessed by two dermatologists 24 hours post irradiation. All volunteers were informed of the nature of the experiments and their consent was obtained.

C) Skin cancer. Skin cancer statistics were provided by the Kuwait Cancer Registry Unit.

D) Minimum erythema dose (MED) to broadband UVB radiation. These measurements were conducted on 26 psoriatic patients about to begin treatment with UVB radiation. The patients were given doses of 50, 100, 150, 200 mJ/cm² on four 2.5 cm in diameter areas of their back, those with very light complexion were given initially 20, 40, 60, 80 mJ/cm². The irradiated sites were assayed 24 hours later and the minimum dose to elicit an erythema reaction was recorded. The instrument used was a Waldman 8001K phototherapy unit with Sylvania 75-85W-UV21 lamps and a power output of 0.4 mW/cm².

E) Melanin absorption. The diffuse reflectance spectra of vitiligo and normal skin of seven volunteers were measured from 280 to 720 nm at 5 nm intervals. The measurements were carried out on a spectrophotometer consisting of a 1000 W Xe light source filtered with a 8 cm optical path water filter and focused into a Jobin-Yvon (HL) monochromator, the output of which was introduced into one leg of a bifurcated quartz optical fiber bundle after going through an order sorting filter (cut-off at 400 nm). The joined end of the fiber bundle was held in a 5 cm in diameter polyethylene holder (2 cm height). The other end was conducted to the input slit of a Jobin-Yvon (H10UV) monochromator, the output of which went to an Oriel photomultiplier-amplifier combination (model 7070). The light source had a shutter installed to assure that the skin sample under study was not exposed to unnecessary amounts of UV radiation. Each spectrum took 15 min. to collect and for this reason the volunteers were in a prone position.

RESULTS

A) Pigment level. The calculated mean was 2.2±0.08 with a standard deviation of 1.40. This was neither a random sample of the population nor a sufficiently large one, however, these data are not presented as a true average as an unbiased indication of the pigment level of the population.

B) Erythema effectiveness of 295, 305, 315 nm. Table summarizes the results for Kuwait and Dundee, Scotland (Mackenzie 1983). Note that for