Urinary Excretion of 5-S-Cysteinyldopa in Healthy Japanese

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Abstract. Urinary excretion of 5-S-cysteinyldopa was investigated in 20 healthy Japanese (10 men and 10 women). The values of excretion varied between 46 and 193 μg/24 h. The mean (±S.D.) was 96.1±9.8 μg/24 h. It was higher in the men than in the women, being 113±15 vis-à-vis 80.8±11.4 μg/24 h. This finding indicates that 5-S-cysteinyldopa is formed and excreted by active melanocytes even in Mongoloids. The excretion of dopa and dopamine was found not correlative with the excretion of 5-S-cysteinyldopa.

Key words: Cysteinyldopa; DOPA; Japanese

It has recently been established that 5-S-cysteinyldopa (5-SCD), which is believed to be an intermediate substance in the formation of pheomelanin, is excreted into the urine of not only healthy Caucasians irrespective of hair color, but also into the urine of dark-skinned individuals (1, 3, 4). This finding indicates that the formation and excretion of this amino acid is in no way limited to individuals with pheomelanic pigmentation.

The purpose of this paper is to report the results obtained in a study of 5-SCD values in the urine of healthy eumelanic Japanese.

MATERIALS AND METHODS

The subject were 20 healthy Japanese with black hair (10 men and 10 women) aged 10 to 62. All of them were resident in Tokyo. They avoided exposure to strong sunlight for 1 month prior to the test. During the months of January and February 1980, 24-hour urine samples were collected in plastic bottles containing 50 ml of acetic acid and 1 g of sodium metabisulfite. Twenty milliliters of the collected urine was adsorbed to Al_2O_3 and eluted with 0.1 N HCl. The values of 5-SCD were determined fluorimetrically *ad modum* Rorsman et al. (7). Pure 5-SCD for the obtaining of standard curves was generously provided by Prof. H. Rorsman, Lund, Sweden. The values of dopa and dopamine were also fluorimetrically (5).

RESULTS AND COMMENTS

Table I shows the excretion of 5-SCD and dopa+dopamine. The values of excretion of 5-SCD varied between 46 and 193 μg/24 h. The mean (±S.D.) of all subjects was 96.1±9.8 μg/24 h. It was higher in the men than in the women, being 113.3±15 vis-à-vis 80.8±11.4 μg/24 h.

In the study of Rorsman et al. (1), the mean value in healthy Swedish was 86.7 μg/24 h, being 100.0 μg/24 h and 77.8 μg/24 h in men and women, respectively. It is an interesting fact that the amounts excreted by healthy Japanese are similar to those in healthy Swedish. The sum of excreted dopa and dopamine varied between 29 and 372 μg/24 h, the mean (± S.D.) being 88.2±16.2 μg/24 h. There were no significant differences ($P<0.05$) between the amount of dopa+dopamine and the amount of 5-SCD excretion.

The present study indicates that 5-SCD is formed by and excreted even in Mongoloids. Therefore, it may be considered that the amino acid is excreted by active melanocytes irrespective of race.

It is known that the determination of 5-SCD serves as a helpful biochemical marker for assessing the progression of melanoma metastasis (2, 4, 6). The observations in healthy Japanese reported here will form a basis for studies on the relationship between the progression of melanoma in Japan and the urinary excretion of 5-SCD.

Table I. *24-hour excretion of 5-S-Cysteinyldopa and DOPA+Dopamine in the urine of healthy Japanese, 10 men and 10 women*

	5-S-Cysteinyldopa (μg/24 h) Mean (±S.D.)	*DOPA + Dopamine* (μg/24 h) Mean (± S.D.)
All subjects	96.1± 9.8	88.2±16.2
Men	11.3±15.0	91.6± 7.6
Women	80.8±11.4	84.9±32.4

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The Effect of Short-term Occlusion on the Cutaneous Flora in Atopic Dermatitis and Psoriasis

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Abstract. The effect of occlusion on the cutaneous microbial flora in patients with atopic dermatitis and psoriasis was measured. Significant increases in the density of *Staphylococcus aureus* and lipophilic diphtheroids were noted after occlusion in eczematous and psoriatic skins. While the incidence of *S. aureus* increased in psoriatic skin after occlusion, this trend was not noted in dermatitic skin.

In atopic dermatitis, colonization with *Staphylococcus aureus* predominates in the involved skin and coagulase-negative staphylococci in the uninvolved skin (2). Coagulase-negative staphylococci dominate in psoriatic skin (6).

When reviewing studies on cutaneous microbial colonization, it is necessary to separate incidence (which may refer to few or many bacteria per patient) and quantity (the number of organisms per unit area, usually colony-forming units (CFU/cm^2)).

Many atopics carry *S. aureus* in their involved and putatively normal skin: the counts per unit area frequently reach 10^6 (CFU/cm^2) in involved skin and 10^5 in "normal skin". Among factors influencing experimental skin infection in man and animal, occlusion (yielding heat and moisture and altering pH), CO_2 emission rate, bacterial antagonism and skin surface lipids, are important (7).

Prolonged occlusion of normal skin increases microbial density and qualitatively alters the aerobic microflora (8, 9). No published data exist on the effect of short-term occlusion on the bacterial flora in pathological skin conditions. This study investigates the changes in the microflora of the skin in atopic dermatitis and psoriasis after short-term occlusion.

MATERIALS AND METHODS

Four male and 6 female outpatients with clinically well established atopic dermatitis and 9 with psoriasis were studied. We excluded patients receiving systemic and/or topical antibiotics for a minimum of a month. Several psoriatics received tar treatment, which was stopped 3 days before the study. All patients had active skin disease at investigation. Overtly inpetiginized patients were excluded. The sites for bacterial sampling were inflamed lesions, and adjacent intact (about 5 cm away from inflamed lesions) areas of the forearm.

Occlusion. The forearm was wrapped with three layers of vinylidine polymer plastic film (Saran Wrap, Dow Chemical, Midland, Michigan) tightly secured at the wrist and below the elbow with paper adhesive tape (Micropore, 3M, St. Paul, Minn.). Samples were taken by the detergent scrub technique (10). The surface was rubbed with a teflon "policeman" in 1 ml of wash solution (0.075 M phosphate buffer with 0.1% Triton X-100) for 1 min; the sample fluid was aspirated with a pipette and serially diluted in a 0.037 M phosphate buffer containing 0.05% detergent. Samples (0.1 ml) of varying dilutions were cultured on appropriate media. The bacteria were identified by Gram stain and appropriate biochemical tests, as described earlier (2).

RESULTS

Atopic dermatitis

Density. The mean lesional density of *S. aureus* increased from 2.3×10^6 to 2.2×10^9 (Table I). This increase was also noted on the adjacent normal skin (4.2×10^4 to 1.2×10^9/cm^2). On 2 patients, tiny pustules or crusts were seen after occlusion. Similar increases of coagulase-negative staphylococci were noted. Micrococci noted before occlusion were not detected after a 24-hour occlusion. Gram-negative