Age-Related Changes in Urinary Excretion of Vanillylmandelate by Adults

To the Editor:
Vanillylmandelic acid (VMA; 4-hydroxy-3-methoxymandelic acid) is the principal metabolite of norepinephrine (NE) and epinephrine (E) in human urine. Its urinary excretion increases until age 20 (1), but the possibility of age-related variations in VMA excretion by adults has rarely been considered (cf. 2).

I have measured the concentration of VMA in overnight urine specimens from 214 women ranging in age from 16 to 82 years (mean, 27.4 years). These women were a sub-group of respondents to a community health survey who did not report any present illness or intake of medications that might influence or interfere with VMA determinations. Creatinine concentrations were also measured, to measure the adequacy of the specimens and to correct VMA concentrations for individual variations in renal output.

Urinary VMA concentrations decreased by 24.2% ($r = -0.136, p = n.s.$) from the youngest to the oldest age group (Figure 1). Creatinine concentrations decreased by 52.3% over the same age range ($r = -0.40, p = <0.001$), and this decrease was sustained after correction for body weight. The decline in creatinine concentrations with age was comparable to that found in other studies based on 24-h specimens (3).

Because creatinine excretion decreases with age, expressing individual VMA in terms of creatinine (µg VMA/mg creatinine) produces a strong positive correlation between these corrected VMA values and age ($r = 0.37, p < 0.001$), with VMA values increasing by 57.3% from the youngest to the oldest age group.

The modest decline in uncorrected VMA excretion with aging would be of minor clinical significance in most cases where a possible diagnosis of neuroblastoma or pheochromocytoma is being investigated, because these disorders result in substantially increased values. However, in cases where collection of 24-h specimens is not feasible, and creatinine-corrected VMA values are used, artifactualy high VMA values might be observed for older persons. Similarly, uncorrected values might result in artifactualy low values for older persons. These problems are most likely when VMA excretion is used as an index of sympathetic-adrenal medullary activity (e.g., in hypertension), or as an indicator of the physiological impact of psycho-social factors. In summary, age-related changes evidently should be considered when excretion patterns of VMA are studied.

References

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Lactic, Levulinic, and Crotonic Acids as Artifacts in Hydrolyzed Urine

To the Editor:

In some organic acidurias the organic acid is excreted as a glycine conjugate. Such conjugates include propionylglycine (1), isovalerylglutamic (2), suberylglycine (3), triglycyglycine, and 3-methylcrotonylglycine (4). Increased amounts of excreted conjugated phenylacetic acid have also been reported (5). Identification and quantitation of the bound organic acid are often crucial for characterization of the abnormality.

In an attempt to establish a procedure for the detection of conjugated organic acids, we have been analyzing urine by