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Thiocyanate is an end product of detoxification of hydrogen cyanide present in cigarette smoke. Its excretion in urine, saliva, and sweat can thus provide a useful marker of exposure in smokers and nonsmokers [1–4]. Salivary tests have the advantages of easy, noninvasive sampling and of good stability, even in nondemanding storage conditions [5]. However, thiocyanate and other cyanogens are also found in many foods including cabbage, broccoli, almond, and horseradish. Consequently, their ingestion can be supposed to artifically increase thiocyanate excretion, thereby affecting the specificity of the test [6].

To evaluate the importance of this alimentary source of thiocyanate, we selected 65 subjects from the screening of 221 consecutive subjects in a smoking cessation program and from a healthy population of adult volunteers. Ages ranged from 18 to 72 years (median 48 years). All subjects were asked to fill in a questionnaire on their smoking habits and on their alimentary intakes during the 3 weeks preceding sampling. The criteria of selection were as follows: smokers (>10 cigarettes/day) who did not ingest cyanogenic food during the last 3 weeks, ex-smokers for >3 weeks, and nonsmokers. Salivary thiocyanate concentration was measured in duplicate by the method of Densen et al. [7]. On the basis of the questionnaire, three groups were compared: Group A included 30 nonsmokers or ex-smokers who had ingested food known to contain cyanogens during the last 3 weeks. Among those subjects, 10 had ingested such food at more than three meals, and three subjects at more than five (up to eight) meals. Group B (n = 20) included smokers, and group C (n = 15) included nonsmokers or ex-smokers who had avoided these foods. The study was in agreement with the guidelines approved by the ethics committee at our institution.

Salivary thiocyanate concentrations were similar in groups A and C (mean ± SD 101 ± 51 vs 92 ± 90 mg/L; not significant) but were significantly higher in group B (413 ± 172 mg/L; P <0.01 vs groups A and B). Considering a cutoff value of 230 mg/L to separate smokers from non-ex-smokers, all but two subjects (one in group B and one in group C) were correctly classified (Fig. 1), which corresponds to a sensitivity of 95% and a specificity of 98%. In addition, no trend toward higher salivary thiocyanate concentrations was observed in group A subjects, whose ingestion of food containing cyanogens was the most important (more than three meals: 97 ± 57 mg/L).

Among the biological markers of the exposure to tobacco smoke, thiocyanate is widely used in epidemiological studies [8–12]. Thiocyanate is a metabolite of cyanide and the end product of the detoxification of cyanide

Specificity of Salivary Thiocyanate as Marker of Cigarette Smoking Is Not Affected by Alimentary Sources, Laurence M. Galanti (Clinical Laboratory, Cliniques Universitaires de Mont-Godinne, B-5530 Yvoir, Belgium; fax 32 81 42 3204)

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compounds by the catalytic action of a mitochondrial enzyme called rhodanase. Hydrogen cyanide and organic cyanides are respectively present in the gaseous and in the particulate phases of tobacco smoke and are absorbed mainly at the pulmonary level. These cyanide compounds are the main source of exogenous thiocyanate in smokers. Saliva tests are the most stable and sensitive procedure for obtaining thiocyanate measures of smoking exposure [11]. The half-life of salivary thiocyanate is 10 to 14 days, allowing the evaluation of exposure to the toxic components of tobacco smoke during the preceding 3 weeks. Besides cabbage, broccoli, almond, and horseradish, cyanide compounds are also present in manioc, wood millet grass, and corn; ingestion of these foods could theoretically increase the thiocyanate concentration independently of smoking exposure. Although no study to date has determined whether or not this alimentary supply may significantly affect the specificity of salivary thiocyanate concentrations as a marker of smoking exposure, alimentary contamination is generally considered, on a theoretical basis, a possible cause of a false-positive test.

Our data show that, in non- and ex-smokers, the concentration of thiocyanate in saliva is not affected by alimentary sources and that the specificity of salivary thiocyanate concentrations to identify smokers is not affected by alimentation. This suggests that, despite the presence of cyanogens in some foods, the usual alimentary supply is too low to significantly affect the diagnostic value of the test. Consequently, the results of this test may be interpreted independently of any dietetic consideration.

Measurement of Maternal Folate Status and Risk of Neural Tube Defects, Gregory S. Makowski* and Sidney M. Hopfer (Div. of Clin. Chem., Dept. of Lab. Med., Univ. of Connecticut School of Med., Farmington, CT 06030; *address for correspondence: Dept. of Lab. Med., Univ. of Connecticut Health Center, MC-2235, 263 Farmington Ave., Farmington, CT 06030-2235; fax 860-679-2154, e-mail makowski@ns01.uchc.edu)

Good evidence exists that increased maternal plasma/red blood cell folate concentrations is associated with fewer neural tube defects in newborns [1, 2]. This finding has led to the suggestion that women pre- and periconception maintain folate adequacy—the concentration of which remains controversial [3–5]. Equally important yet generally overlooked is the variety of analytical methods used for folate measurement. For example, review of data obtained from ~1400 clinical laboratories participating in the 1995 College of American Pathologists (CAP) analytical survey [6] yields striking differences in plasma folate measurement. In three challenges during 1995 (K-A, K-B, and K-C), laboratories were asked to determine folate concentration in nine plasma samples (red blood cell folate was not measured). Survey data were grouped by methodology and statistical analysis was performed. Only results obtained from at least 20 laboratories reporting were considered for this study (>90% data).

Larger differences in mean plasma folate concentration were observed when a manual radioisotopic immunoassay was compared with an automated fluorescent method (Fig. 1A). Of the nine samples evaluated during this survey period, the most discrepant (comparison of mean) plasma folate results were seen in six samples analyzed by these two methods throughout the concentration range tested (marked with an asterisk, Fig. 1A). Differences in the nine folate results obtained by these methods ranged from 144% to 264% and placed first [6], second [1], or third [2] in degree of discrepancy when compared with all methods cited in the survey (Table 1). Comparison of results for mean plasma folate concentration obtained with the manual vs automated method revealed considerable bias (Fig. 1B) [e.g., an automated plasma folate concentration of 5 µg/L (adequate) would be considered marginal or inadequate (2.5 µg/L) by manual method]. Average CV was not, however, substantially different for the automated and manual method: 9.6% (range 4.7–12.2%) and 10.5% (range 8.2–16.6%), respectively. Also notable is the trend in the number of laboratories using these two methods throughout the concentration range (Fig. 1C). The manual RIA method was most cited in K-A, whereas the automated method was most cited in K-C.

The shift in plasma folate methodology may reflect decreased reliance on radioisotopes in general as well as...