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The Microchromatographic Estimation of Fetal Hemoglobin Levels in Hereditary Persistence of Fetal Hemoglobin

To the Editor:

Abraham et al. (1) measured fetal hemoglobin by a microchromatographic method in the presence of HB A. Later (2), this group determined fetal hemoglobin by a microchromatographic method in the absence of HB A in sickle-cell syndromes, including the condition of HB S-hereditary persistence of fetal hemoglobin (HPFH). We report the application of microchromatography to measurement of fetal hemoglobin in two other patients with different combinations of HPFH—with and without HB A. To our knowledge, this is the first report of microchromatographic quantification of HB F in the presence of HB A.

Our first patient was an asymptomatic black man whose hemolysate had an HB CFA pattern by both cellulose acetate and citrate agar electrophoresis (Helena Laboratories, Beaumont, TX 77704). The mean cell volume and Hb were 86 fl and 160 g/L, respectively. The hemoglobin was solubility negative (Dade Division, American Hospital Supply Corp., Miami, FL 33152). The proportion of HB C and HB A was 38% (3). The Kleihauer smear (4) had an even Hb F pattern (Bio-Dynamics, Inc., Indianapolis, IN 46250). The fetal hemoglobin by alkali denaturation (FAD) was 32.5% and 24.1% by the methods of Singer et al. (5) and Betke et al. (6), respectively. The Hb F by radial immunodiffusion (7, Helena Labs.) was 36% at a 10-fold sample dilution. The Hb F by densitometry (8) was 40%. Microchromatographically, the Hb F was 35.0% and 35.6% on two occasions (2). Concentrates of fast hemoglobin eluates from cation-exchange microchromatography showed a major band with Hb F mobility and minor band with Hb A mobility representing HB A1 on cellulose acetate electrophoresis (9).

Our second patient was an asymptomatic Southeast Asian man with a mean cell volume of 61 fl and an Hb of 115 g/L. The Kleihauer smear (4) had an even distribution of Hb F. The cellulose acetate electropherogram had an HB CF pattern; the citrate agar electropherogram had an Hb AF pattern. Fetal hemoglobin was 37.5% by densitometry (8) and 27.4% by microchromatography (2).

We believe our first patient has a combination of HB C and a rare type of HPFH with associated beta-chain production (10, 11), whereas our second patient has the HB E–HPFH condition. We conclude that our data show clinically adequate agreement between the microchromatographic and other methods of Hb F measurement. Both of the above HPFH syndromes are uncommon and, to our knowledge, microchromatographic Hb F determination has not been applied to them before. Finally, the results for our first patient demonstrate the feasibility of microchromatographic Hb F measurement in the presence of a substantial percentage of Hb A.

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References


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Day-to-Day Variation in Breath Hydrogen Concentration on Awakening

To the Editor:

Measurement of hydrogen in the breath has become an important diagnostic test for evaluating intra-intestinal carbohydrate metabolism (1). Most commonly, the procedure involves collection of breath samples before and at intervals after an oral dose of a carbohydrate substrate of interest, such as lactose or sucrose. The criterion for incomplete absorption that is most often applied is the increment in breath H2 concentration above fasting values; an increase exceeding 20 μL/L represents a positive test result for malabsorption (2). Because most subjects arrive for their tests after several hours...