Biological variation of free plasma amino acids in healthy individuals

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Abstract

Background: Biological variation data for free plasma amino acids are lacking from the more comprehensive databases. Therefore, we determined the intra- and inter-individual components of variation in healthy subjects. These data were used to define desirable goals for imprecision, bias and total error, indices of individuality and reference change values.

Methods: Plasma samples were collected from 11 volunteers at weekly intervals over 5 weeks. Free plasma amino acids were analyzed by reversed-phase HPLC and analytical and biological variation data were derived using ANOVA.

Results: Intra-individual coefficients of variation ranged from 9.5% to 46.4%, with lower values among the essential amino acids. The mean inter-individual coefficient of variation was 46.6% and was higher than intra-individual values for all amino acids. Thus, indices of individuality were below 0.8. Reference change values ranged from 30.9% to 128.4% and total error values ranged from 15.2% to 61.0%.

Conclusions: Plasma amino acids exhibit relatively low intra-individual coefficients of variation, with essential amino acids showing tighter homeostatic control. Analytical quality goals can be reasonably achieved with current methods. Reference intervals are of limited value in the detection of unusual results in an individual. Therefore, comparison of serial results by means of the reference change values is recommended.

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