

Underivatized Amino Acid Analyses Using Liquid Chromatography-Tandem Mass Spectrometry in Scalp Hair of Children with Autism Spectrum Disorder

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Abstract : Autism Spectrum disorder (ASD) is a psychiatric disorder with unknown etiology that mainly affects children in the first three years of life. Alterations of amino acid levels are believed to contribute to ASD. The levels of six essential amino acids (methionine, histidine, valine, leucine, threonine, and phenylalanine), five conditional amino acids (proline, tyrosine, glutamine, cysteine, and cystine), and five non-essential amino acids (asparagine, aspartic acid, alanine, serine, and glutamic acid) in hair samples of children with ASD (n = 25) were analyzed and compared to corresponding levels in healthy age-matched controls (n = 25). The results showed that the levels of methionine, alanine, and asparagine were significantly lower in the hair samples of ASD group compared to those of the control group ($p \leq 0.05$). However, the levels of glutamic acid were significantly higher in the ASD group than the control group ($p \leq 0.05$). The current findings could contribute towards further understanding of ASD etiology and provide specialists with a hair amino acid profile utilized as a biomarker for early diagnosis of ASD. Such biomarkers could participate in future developments of therapies that reduce ASD-related symptoms.

Keywords : autism spectrum disorder, amino acids, liquid chromatography-tandem mass spectrometry, human hair

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