Association of Carboxylesterase 1 Gene (CES1) Polymorphism with Weight loss in Children with Attention Deficit Hyperactivity Disorder during Methylphenidate Treatment

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Abstract:

Children with Attention Deficit Hyperactivity Disorder (ADHD) show large variations in response to methylphenidate (MPH) treatment, which may result from genetic factors associated with MPH metabolism. We aimed at investigating a possible link between the -75 T>G polymorphism in the 5’ untranslated region of the gene coding for carboxylesterase 1 (CES1) and a common adverse effect, weight loss, during the first three months of MPH treatment. We analyzed the association between a CES1 polymorphism and longitudinal clinical data based on retrospective analysis of medical records, from first to last recorded visit at the clinic. By use of poly chain reaction and the Sanger method we genotyped the -75 T>G gene polymorphism and examined the association to clinical response, which was based on retrospective analysis of longitudinal clinical data from medical records. The primary clinical outcome measure was weight loss during the first 3 months of MPH treatment. Data from 74 MPH treated children with ADHD, mean age 8.6 years, 57% males, were analyzed. There were n=26 G-carriers (heterozygote TG and homozygote GG) and n=48 TT-homozygotes. The proportion of weight loss and mean weight change differed significantly in G-carriers (88% / -0.279 kg) compared with TT-homozygotes (31% / +0.157 kg). This study shows an association between the -75 T>G polymorphism in CES1 and MPH treatment response, demonstrated by a significantly higher frequency and extent of weight loss in G-carriers compared to TT-homozygotes.