Abstract

Asthma and atopy are two closely related, common complex traits in which a number of genetic and environmental factors are suspected to play a role. We have performed parametric and nonparametric multi-marker linkage analysis for the Busselton data set, which is part of problem 1 of Genetic Analysis Workshop 12. In particular, we have focused on the dichotomous trait atopy, as well as on dichotomized versions of the quantitative traits RASTI and loge slope. The lod score analysis with adequate modeling of a parent-of-origin effect, by use of the program GENEHUNTER-IMPRINTING, was a special interest. The most prominent findings are a multipoint mod score of 3.12 at D13S153 for RASTI, and a multipoint mod score of 4.32 at the same locus for atopy, both with four-penetrance imprinting models that point to a gene subject to maternal imprinting. In addition, there are marked differences between imprinting and non-imprinting mod scores. These results corroborate earlier findings of linkage between atopy and D13S153, but add the aspect of paternal gene expression. Furthermore, suggestive evidence for linkage to atopy is found near D6S291, D7S530, and D14S74. The best-fitting models for chromosome 6 and 14 may suggest that genomic imprinting takes place at these two loci as well.