

Tumor Necrosis Factors, Molds and Asthma in Children: A Haplotype-Based Analysis.

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BACKGROUND: Constitutional and environmental are currently known or strongly suspected determinants of asthma. The interaction between genetic and environmental determinants has not been well investigated.

OBJECTIVES AND METHODS: This study was to evaluate the independent and joint effects of molds and genetic factors on the development of asthma in children. We have designed three specific aims. First, we assessed the effects of molds exposure on the development of asthma. Second, we assessed three single-nucleotide polymorphisms (SNPs) of tumor necrosis factor (TNF) (rs2229094, rs1800629, rs2256974) as predictors of asthma by comparing the prevalence of three markers in 262 cases of asthma and 747 controls. Finally, we determine whether there is a joint effect of genetic and molds exposure on the development of asthma, i.e. gene-environment interaction between these genetic markers and molds exposure that explored to be very important determinants of asthma.

RESULTS: Compared with no exposure to molds, children exposure to molds were at a 1.92-fold higher risk of asthma (95% CI, 1.42-2.60). Children carried a copy of h100 were at a 1.28-fold higher risk of asthma (95% CI, 0.96-1.70) as compared those with two copies of the most common haplotype (h001). Children exposed to molds and carrying at least one variant rs2229094 allele had about three times the risk of asthma (OR = 2.70; 95% CI, 1.76-4.17; interaction p-value =0.37) as compared with those without both exposure to molds and carrying h100 genotype.

CONCLUSIONS: Exposure to molds may contribute to the occurrence of asthma. Haplotypes (h100) that included the promoter SNP (rs2229094) may also relate to the development of asthma. However, there is no apparent joint effect between haplotype (h100) and molds exposure on the risk of asthma among children.