



Research article

We prove that the transmission of allergy and asthma is fully genetic in 200 children, mainly if asthmatic

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Abstract

There seems to be no unanimity of opinion as to the mode of transmission of allergic disease. According to some, allergy is transmitted as a simple Mendelian dominant. In direct contrast, others maintain that the findings favor a recessive mechanism. Furthermore, others suggest that the condition is inherited as a "partial dominant" disorder. An additional analysis of family studies as well as data already published, failed to support the simple either dominant or recessive theory. The dominant theory does not explain why in more than half of the pedigrees both parents are normal. The recessive theory is refuted by the existence of pedigrees in which both parents are affected, yet some of the children are normal. To put more order in this complex mess, we have decided to study the genetic risk of children with a family history (FH) of allergy. We have therefore formed this prospective study in 200 children that included: family (FH) and personal history, skin prick tests (SPTs) and specific IgE (RAST), who were admitted to the Pediatric Allergy and Immunology Division of Rome University since they were affected with respiratory allergy. We have prepared a sheet with questions and possible answers. Consequently, we have studied the FH of these children asking whether their parents and brothers/sisters had atopic diseases, and specifying whether such disorders were respiratory or food allergies (FA). The parents of all children gave their informed consent. We analyzed data using the X2 method. 42.3% of their parents were atopic, as well as their 20 brothers/sisters. In total, 90.2% of fathers, 84% of mothers and 65% of brothers/sisters had asthma or allergic rhinitis (AR). We add that some parents had urticaria, further there were mothers and brothers/sisters experiencing atopic dermatitis (AD), and some mothers with food allergy (FA). In 23 children from these parents most had AD and respiratory allergy. In 200 children comparable for age and sex with no respiratory disorder supplied from our outpatient clinic 40 parents, 14 mothers and 26 fathers and 9 brothers/sisters had asthma or AR ($p = 0.0001$), some fathers had also urticaria and two brothers AD. A major part of respiratory allergy is not transmitted by mothers: we stress that 42.3% of parents are atopic, and FH of their children was positive for respiratory allergy in 82-92% of cases. Thus respiratory allergy can have an autosomal dominant mode of inheritance, but considering the other atopic diseases, the transmission can be polygenic. The impact of genetic factors in these children is stressed by the relevant quote of asthmatic brothers/sisters.

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