food allercy versus in halant allergy in asthmatic children asregards gentic profile

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Asthma is the most common chronic illness in childhood, affecting more than 8-9% of Egyptian children. The prevalence of childhood asthma and that of severe asthma has been on the increase in recent decades.An association between asthma and allergy has long been recognized. Exposure to inhalant allergens is the most common precipitating factor of asthma. On the other hand, the importance of food allergy in childhood asthma has been a subject of debates for many years.Clearly, there are strongly inherited components of asthma. Studies gave asthma a heritability estimate of about 36-70%. Evidence for linkage of a broadly defined allergic phenotype to markers on chromosome 11 q was first described in 1989 by finding linkage of atopy defined by IgE responses, to the chromosome 11 q 13 marker D11S97. Detailed study of this chromosome reported localizing the I3-chain of the high affinity receptor for IgE (FC epsilon RI beta) to be the major site for such linkage.Detailed determination of coding sequence of IgE receptor (FccRI-B) on chromosome 11q13 is now nearly complete. The first reported (FccRI-B) polymorphism were two amino acid substitutions within exon 6 designated Leu 181 and Leu 183, which were found to be highly predictive to atopy when inherited maternally. Since described, this associationinherited maternally. Since described, this association was a matter of conflict While some studies failed to find such linkage, many other studies found it with a wide range of significance.There are 2 major aims of this study. The first is to evaluate the role of food allergy as a risk and precipitating factor for asthma versus the role of inhalant allergy. The second aim is to study the genetic background of asthma in Egyptian children focusing on determination of coding sequence of IgE receptor (FccRI-B) on chromosome 11q13 to detect the polymorphism Leu 181 which was highly predictive to atopy and asthma.Our study included (58) asthmatic children and (23) non-asthmatic children as a control group. Both asthmatics and controls are matching as regards their mean age, age range and male to female ratio. In addition both asthmatics and controls are living in the same environmental condition. Most of them are living in village in new concrete houses with no animal contact.All patients and controls were subjected to a complete history taking (personal history, medical history of asthma and other respiratory diseases, history of food allergy and other allergic diseases, family history of asthma and other allergic diseases and general medical history) and complete physical examination.A complete dietetic history was taken carefully from all asthmatics and controls of the study. This dietetichistory included age of

diagnosis, type of food, frequency of attacks, duration of attacks, severity of attacks, signs and symptoms during the attack and treatment used.In addition and as an in-vivo immunologic test, skin prick test (SPT) was done for all patients and controls using the most common inhalant and food allergens in Egypt i.e. house dust mite [Dermatophagoides Farinae (D.F) and Dermatophagoides Pteronyssinus (D.P)], egg (whole egg), fish (fresh water fish) and cereals (mixed 7 cereals).A complete blood count and blood film was done for all asthmatics and controls of the study to diagnose eosinophilia and grade it. Stool and urine examinations were performed to all cases and controls to exclude parasitic infestation as a common cause of blood eosinophilia.On the basis of results of skin prick test and dietetic history, two groups of asthmatic patients were identified: (34) food allergic asthmatics (showing positive dietetic history of food allergy and/or positive reaction to one or more of the 3 food allergens used in SPY) and (17) inhalant allergic asthmatics (showing positive reaction to one or the two inhalant allergens used in SPY).We made a comparison between (a) asthmatics and controls, (b) food allergic and non-food allergic asthmatics, and (c) inhalant allergic and non-inhalant allergic asthmatics. We compared them as regards environmental conditions, age of diagnosis of asthma,severity of asthmatic attacks, seasonal and diurnal variation, family history of asthma, level of peripheral eosinophilia, dietetic history and results of SPT.For genetic study, fresh venous blood 5 cc samples were taken by on EDTA for DNA extraction from (55) children, (39) asthmatic cases and (16) controls. Four samples (1 case and 3 controls) were lost during storage and transport so that we have finally (51) samples, (38) cases and (13) controls.DNA was extracted, its quantity determined, and then used as a template DNA for amplification. The amplification refractory mutation assay was carried out with oligonucleotide primers according to Hill et al., 1995 (5 FU, 5WK, 3M and 3FU)Amplified products were separated in a 35 (3:1 LMP agrose: Nusieve) gel containing ethidium bromide and visualized under ultraviolet light.Our results show that asthmatics have male to female ratio of 1.4-1 matching with the international reports of asthma prevalence. Most of these children suffer mild asthma with a trend of those living in towns to suffer more severe attacks. Most of asthmatics are diagnosed during the first year of life and half of them have positive family history to asthma. Asthma attacks are infrequent, last for less than 7 days, more frequent in winter, with frequent nocturnal attacks and precipitated with dust, infection, exercise and foods. Most of asthmatics suffer wheeze, cough and fever. They are mostly treated in the out patient clinic with oral P-agonists, cough therapy, antibiotics and minophylline.Asthmatic patients of the study showed higher figures (69%) of blood eosinophilia (AEC above 300) compared to controls (30.4%). This difference becomes more clear when taking very high levels of AEC where (34.5%) of asthmatics have AEC above 600 compared to (8.7%) of controls. However, we found no significant association between severity of asthmatic attacks and the level of AEC.As high as (39.7%) of our asthmatic children reported positive dietetic history compared to only (8.7%) in controls. This percent is actually higher that that mentioned by previous studies. As high as (91.3%) of our asthmatic patients with positive dietetic history reported respiratory signs and symptoms as a manifestation of their food allergic attacks. Egg was the most common food causing food allergy

(42.2%) followed by fish (24.4%), milk (17.7%), banana (11.1%), mango and peans (2 3%).The study also showed that asthmatics with positive dietetic history suffer more severe attacks of asthma than those with negative dietetic history. (60.9%) of asthmatics with positive dietetic history suffer moderate to severe asthmatic attacks compared to (37.1%) in those with negative dietetic history.Moreover, it was found that asthmatic patients show higher incidence of positive skin prick test (S137) to different allergens compared to controls. As high as (29.3%) of asthmatics gave positive skin prick test (SP7) results to one or the two inhalant allergens used compared to only (8.7%) in controls. In addition, (32.7%) of asthmatics gave positive skin prick test(SPY) results to one or more of the 3 food allergens used compared to (8.7%) in controls.Furthermore, asthmatic children with positive skin prick test (SPI) result either to food or inhalant allergens were found to have higher figures of absolute eosinophilic count (AEC). This was confirmed by comparing food and inhalant allergic asthmatics by non-allergic patients. It was found that food and inhalant allergic asthmatics showed higher figures (52.9-64.7%) of eosinophilia compared to non-allergic asthmatics (16.7-26.8%).Most of inhalant (76.5%) and food (58.8%) allergic asthmatics were diagnosed after their first year of life.On the other hand, we found no statistically significant association between dietetic history and either environmental condition or family history of asthma. We found also no statistically significant association between results of skin prick test (SP7) and either severity of asthmatic attacks or dietetic history to different foods. There was no statistically significant difference as regards the nutritional pattern between asthmatics and controls either in all asthmatic group or in inhalant or food allergic patients. And lastly, we found no statistically significant differences between food or inhalant allergic asthmatics and non-allergic patients as regards severity of asthmatic attacks, seasonal, diurnal variations or family history of asthma.Results of our genetic study showed that there is a statistically highly significant association betweenasthma and the presence of Leu 181 polymorphism. (81.5%) of asthmatics were found to be positive to Leu 181 polymorphism on PCR versus (16.7%) only in controls. On the other hand, no such association was found with the Ile 181 (wild type) as all asthmatics and controls were positive to it on PCR.Indeed, all our patients with positive Leu 181 polymorphism were heterozygous (NL) with positive reaction to both Leu 181 and Ile 181.In contrast, no statistically significant association was found in this study between Leu 181 polymorphism and the severity of asthmatic attacks or the family history of asthma. No such association was found also between the Leu 181 polymorphism and the level of absolute eosinophilic count (AEC), the results of skin prick test (SPT), presence of positive dietetic history or the nutritional pattern of asthmatic children.To summarize, our study results on food and inhalant allergy in asthmatics showed that in addition to inhalant allergy, food allergy is a common risk factor for asthma. A considerable percent of children report many types of food (mainly egg and fish) as a precipitating factor for asthma. Positive dietetic history is a risk factor to suffer more moderate to severe asthmatic attacks. Inhalant and food allergic asthmatics tend to be diagnosed as asthmatics -later in their life (after one year of age) and show higher levels of AEC than non allergic asthmatics. Asthma, inhalant allergy and even food allergy have no effect on the nutritional pattern of asthmatic children.Our results agree with many studies

-that correlated mutation in the (3 subunit of the high affinity receptor for IgE (FccRI B) of chromosome 11q13, mainly with Leu 181 polymorphism, to atopy and asthma. We concluded that the polymorphism Leu 181 of the beta sub-unit of the high affinity IgE receptor (Fce.RI-B) gene on chromosome 11q13 is highly prevalent in Egyptian Arabs and is a significant risk factor for asthma in this population.RecommendationsOur results must attract the attention of doctors to the importance of taking a careful and full dietetic history for each asthmatic child. If good dietetic history pointed to a sort of food as a precipitating factor for asthma, full investigations must be made for a good planning for avoidance and may be desensitization must be included in treatment protocol.Further studies are needed for more advanced localization of different mutations in the genetic map that has association with asthma and study of these mutations especially in the Arabian population.