Abstract

Asthma is an inflammatory disorder of the airways which is affected by the interactions of several genetic and environmental triggers in each population. To understand the genetic factors in the manifestation of asthma, the following objectives were assessed: a) to study the relation between age, gender, body mass index [BMI], allergic sensitization and severity of asthma, b) to assess the association of interleukin 10 [IL-10] and interleukin 17-F [IL-17F] promoter single nucleotide polymorphisms [SNPs] with asthma, c) to perform in silico studies on nonsynonymous SNPs in IL-17F, d) to investigate the association of IL-10, IL-17F and interleukin-33 [IL-33] serum levels with asthma, and e) to investigate the correlation between IL-10 and IL-17F SNPs and their serum levels. A total of 2436 asthmatics and 393 controls were selected. Patients were classified based on their gender, age, BMI and sensitization in skin prick test [SPT]. IL-10 (rs1800871, rs1800896) and IL-17F (rs1889570) SNPs were genotyped using Mass ARRAY. Cytokines serum levels were evaluated using ELISA. The observation revealed that in children most severe patients were males, in adults most severe patients were females in the age range of 51 to 60 years, with most overweight and obesity. House dust mite and cockroach were two most common allergens, where the sensitization level was correlated with severity of disease. The results showed an association between IL-10 SNPs and mild asthma; a positive correlation between IL-17F rs1887570 AA and number of allergen sensitized, and no association between IL-17F SNP and asthma. Significant improvement in lung function was observed after two months of treatment, with no difference among SNPs. In silico studies revealed mutant proteins having conformational and functional variations as compared to wild type. Diminished IL-10 level and elevated IL-17F and IL-33 levels were observed in asthmatics than controls. IL-17F was associated negatively to forced vital capacity [FVC] and forced expiratory volume in one second [FEV1] and positively to number of allergens sensitized and FEV1 reversibility. No difference was obtained when cytokines serum levels was compared among individuals with different IL-10 and IL-17F SNPs. Further large scale investigations along with in-vitro functional experiments will help to validate these results.