Preface

Asthma is a crucial health concern worldwide. Its main features involve an inconsistent level of airflow obstruction, airway hyperresponsiveness and inflammation. Individuals of any ages all over the world have been influenced by this chronic bronchial disease which, when cannot be controlled, will impose rigorous restrictions on routine life and is occasionally lethal. The incidence of asthma is rising in the majority of the countries, particularly among children and it has been predicted to still increase in the subsequent few decades, as countries become more urbanized (Masoli et al., 2004). Around five to ten percent of asthmatic individuals have severe asthma which is burdensome to control even with available inhaler treatments (Wenzel, 2005). This category of asthmatic patients expends ~60% of the asthma treatment resources due to spontaneous primary care visits and hospitalization rate. Asthma burden is undergone not only due to healthcare expenditures but also as lost efficiency and decreased contribution to both family as well as daily life. During last decades, lots of systematic progressions have developed the perception of asthma and the capability to handle and control it efficiently. Several genetic as well as environmental triggers are involved in etiology of this disease. Eighteen genomic regions and >100 genes have been associated with allergy and asthma in 11 different populations (Ober and Hoffjan, 2006). Studies investigating gene-gene as well as gene–environment interactions have realized that genetic predisposition to asthma is complicated and context dependent and asthma-associated genetic variations have an intricate interaction with environmental triggers, other associated genes, as well as host factors including age or disease phase (Martinez, 2007; Thompson et al., 2007). The basis of asthma care involves minimizing asthma triggers and a stepwise strategy to therapeutic interventions to attain and sustain control of asthma (www.ginasthma.org).

In view of this, the present study was carried out to investigate the genetic as well as environmental triggers that are involved in etiology of asthma in the population of south India. The findings and implications of this study are presented as follows:

Section I is the review of the available literature on asthma and its triggers.
Section II includes experimental as well as in silico study of asthma genetics and environmental triggers with main focus on the effect of gender, age, BMI and allergic sensitization in asthma; the association of cytokines promoter polymorphism and asthma; in silico studies on nonsynonymous SNPs of IL-17F as an asthma candidate gene; the association of cytokine serum levels and asthma; and the correlation of cytokines promoter polymorphisms and their expression level in the population of south India. These objectives are assessed and presented in the following subsections of materials and methods, observations and discussion.

Section III includes the summary of the findings and brings the future perspectives of the present study.

Section IV includes the literature that has been referenced.

Section V presents appendices which includes chemicals and reagents used, abbreviations, and list of publications of the present study.