ABSTRACT

Asthma is a chronic respiratory disorder results in bronchoconstriction, airway remodelling, airway hyperresponsiveness and airway inflammation. It affects more than 30 million people in India and is second largest cause of mortality in India. β2 receptor agonist and glucocorticoids are the two most widely prescribed drugs for the treatment of asthma along with mast cell stabiliser, atropine derivatives and monoclonal antibodies viz. Montelukast, Ipratropium bromide & Omalizumab, respectively. The drugs prescribed for the treatment of asthma are not devoid of side effects and herbal alternatives are thought to be good options for the treatment of asthma. Herbal drugs are generally considered to be safe and free from side effects. In order to find a suitable herbal option for asthma the present study was designed to investigate the role of isolated compounds from three different herbs i.e. Achillea mellifolium, Rubia cordifolia & Saussurea lappa. The plants were selected based on the available ancient literatures and their potential anti-inflammatory properties which is said to be mainstay in the pathogenesis of asthma. The plants were authenticated and further, the 7 different compounds were isolated from them namely achillicin, chamazulene, rubiadin, mollugin, costunolide, dehydrocostus lactone and cynaropicrin. The compounds were characterised using IR, NMR and Mass spectra. Various chemical analysis and chromatographically techniques were used to identify them.

These compounds were then subjected to in-vitro studies on rat tracheal strip preparation isolated from rats. The strips were contracted with carbachol and relaxant effect of these compounds was estimated using isolated organ bath studies. pD2 values were calculated and compared with standard isoprenaline. Among the seven compounds, three compounds viz. chamazulene, mollugin & costunolide were found to be most active and were further subjected for in-vivo studies using rats.

During in-vivo studies rats were sensitized using ova albumin and were re-sensitised and challenged on 22nd day, further the treatment with the isolated compounds were given for 7 days prior to challenge and the rats were subject to necropsy. Various biochemical markers were detected viz. PAF, EPO, SOD, IL-6, IL-8, TNFα and NO in blood as well as in bronchoalveolar lavage fluid in various treated groups, challenged, sensitized & unsensitized group and compared with standard dexamethasone. Finally, it was found that out of three compounds and their combination mollugin were found to equipotent to dexamethasone whereas costunolide was more potent than dexamethasone in treating experimentally induced asthma in rats. To make these compounds to be used in clinical studies further evaluations on their toxicity and molecular mechanisms need to be understood.