6. Summary and Conclusion

The outcome of the current study confirmed that HG and combination shows significant anti-inflammatory effects, in all the inflammatory models such as, Croton oil induced ear edema in mice, Cotton pellets induced granuloma in rat, TNBS induced colitis in rat, DNFB induced dermatitis in mice, OVA induced lung edema in mice and CFA induced arthritis in rats. HG and its Combination with FC showed significant anti-inflammatory action on acute inflammation as demonstrated by the inhibition of ear edema induced by croton oil and inhibition of granuloma formation in cotton pellet model, justifying its traditional use as a remedy for skin disorders. These anti-inflammatory effects were supported and confirmed by histological data obtained by ear tissue in croton oil induced ear edema model.

So, the existing anti-inflammatory research work provides evidences for the hopeful ameliorating effects of HG on TNBS-induced colitis in rats that could be mediated through mitigation of leukocyte influx to colonic tissues (measurement of MPO level), suppression of inflammatory cytokines such as TNF-α and IL-12 along with histopathological analysis of rat colonic mucosa. Thus, our data represent a valid rationale for the use of HG as a complementary approach, with lower incidence of side effects, during the management of IBD.

In this study, HG and its combination had shown its anti-inflammatory effects on DNFB induced dermatitis in Balb/c mice. HG and combination helps in reducing Th1 skewing reactions such as TNF-α and IL-12 production resulting in reduced hyperplasia of ear tissue, edema, epidermal spongiosis and immune cell infiltration. These consecutive anti-inflammatory reactions of HG and combination finally led to inhibition of ear swelling. Overall, these results indicate that HG and combination can be used to reduce the use of or replace the corticosteroids in dermatitis treatment.

Our result indicates that HG and combination treatment reduces the accumulation of eosinophils and other inflammatory cells (neutrophils, lymphocytes, and macrophages) in BALF of OVA-immunized mice. In addition, HG and Combination significantly suppressed the production of pro-inflammatory cytokine (TNF-α, IL-6, IL-12 and TXB2) by peribronchial lymphocytes. Furthermore the combination was found to be more potent than HG in all aspects.
The results of the present study suggest that HG and combination were effective on CFA induced arthritis in rats. The anti-arthritic activity of HG and combination are probably related to decrease in the spleen and thymus weight, down-regulation of pro-inflammatory cytokines levels (TNF-α, IL-6, IL-12 and TXB2) in the serum of CFA treated rats, decrease in the MPO level and suppression of COX-2 gene expression. The anti-inflammatory activity was performed on rats by measuring various biochemicals, haematological, histopathological and radiological parameters. All these results predict that HG and combination with FC provides pharmacological basis for the conventional use of HG against various inflammatory conditions such as rheumatoid arthritis. RT-PCR gene expression studies showed that HG and combination significantly reduced the COX-2 expressions in the affected joints of CFA treated rats. Furthermore, the mechanistic action of HG may supports to the development of novel drugs for RA therapy in the future.