ICS-IUGA 2010 Abstract Form

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Abstract Title:

Honey Inhibits Mast Cell Degranulation: Implication for Management of Cystitis

Abstract Text:

Hypothesis / aims of study

This study compares inhibition of mast cell degranulation between panels of honey preparations and conventional topical treatments used against painful bladder syndrome/ interstitial cystitis (PBS/IC).
The hypothesis underpinning these experiments is that the anti-inflammatory action of honey is different from that of the conventional agents, offering the possibility of alternative or combination treatments for PBS/IC.

Study design, materials and methods

The study builds on firm results in preparation for publication, that show various honey types to inhibit calcium ionophore-induced degranulation of the human mast cell line 'LAD-2' [1]. Histamine release, both spontaneous and stimulated by calcium ionophore A23187, was measured by a commercial ELISA assay. Concentrations of honeys that demonstrate inhibition of histamine release from stimulated LAD-2 cells were compared with conventional agents, diluted serially from their intravesical therapeutic concentrations.

Results

Histamine release from LAD-2 cells is inhibited in a dose-dependent fashion by honey (fig.1), both spontaneously and when stimulated by calcium ionophore A23187. Honeys derived from a range of nectars show different activities in this respect (fig.2). By comparison, few of the conventional PBS/IC treatment drugs showed any inhibition, none were strong inhibitors and some increased histamine recovery (fig.3).

Interpretation of results

The results presented above demonstrate that honey can have a strong inhibitory effect on degranulation of the LAD-2 cell line, as evidenced by histamine release. Eucalyptus-based honey appeared particularly effective in this model. None of the panel of conventional intravesical agents was as effective; most were completely inactive in this model.

Given that PBS/IC is an essentially inflammatory process and that mastocytosis in the bladder wall has been used to diagnose the condition [2], it is reasonable to suppose that honey preparations might be a useful additional tool in the clinical management of PBS/IC.

In-vitro studies from this group exposing rodent urothelium to honey dilutions have provided evidence that honey might be well tolerated as an intravesical agent and even provide some protection against chemical (acid) damage [3].

Concluding message

Honey has strong potential as an intravesical agent for the treatment of PBS/IC. Its activity against mast cell degranulation is not represented in current treatments and promises an additive effect in combination therapy. *In-vivo* studies of intravesical tolerability in intact rodents and humans (i.e. phase-I trial), including bladders with compromised urothelial linings, are warranted.

References

1. Nakashima K, Takeuchi T, Shirakawa T. Biol Trace Elem Res. 2005; 108: 105-14.
2. Richter B, Hesse U, Hansen AB*, et al*. BJU Int. 2010; 105 :660-7.
3. Cooper A, Lwaleed B, Birch B. Honey: Urology 2009; 74: 108.

Fig. 1
Dose-dependent inhibition of mast cell histamine release by calcium ionophore A23187using four honey concentrations (n=4).

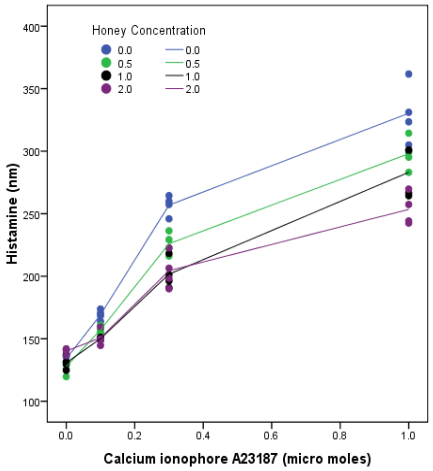

Fig.2
Percent inhibition of induced histamine release by different honey types (n=8): Clover nectar and 'artificial' honey (a glucose fructose syrup) are control preparations. 'Manuka 02' is an aged honey.

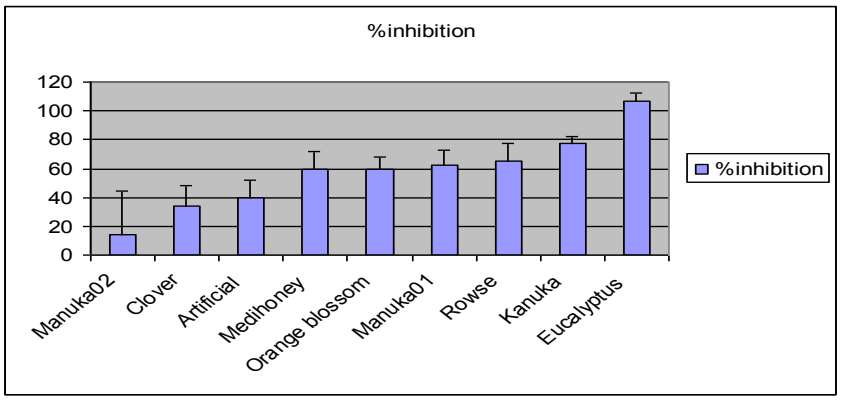

Fig. 3
Percent inhibition of calcium ionophore induced histamine release using 2 honey concentrations and 3 dilutions (from clinical intravesical concentrations) of common PBS/IC drugs (n=4). RIMSO-50 is dimethyl sulfoxide with a probable anti-inflammatory action, the other drugs target deficiencies in the glycosoaminoglycans layer lining the bladder lumen.