INTRODUCTION

The bioactive properties of Manuka honey are now well recognised (including antimicrobial, anti-inflammatory and immune-stimulatory activities) and most of these actions are attributed to the naturally occurring compound methylglyoxal (MGO). However, the nature of honey (a sticky, viscous fluid) can be a challenge when using it as a treatment in health management. A new product (Manuka honey with Cyclopower) has not been developed using encapsulated Manuka honey combined with cyclodextrin (a natural cyclical sugar), creating a free-flowing powder that can easily be added to foods and beverages for ease of delivery of health benefits. The aim of this work was therefore to assess the bioactive properties of Manuka Honey with Cyclopower as compared with the uncomplexed honey.

METHODS

A series of small studies have investigated the activity of Manuka Honey Cyclopower™ vs standard MGO250 and/or MGO400 Manuka honey.

Anti-inflammatory activity was determined in vitro by measuring inhibition of neutrophil TNF-α secretion. The antibacterial properties of Manuka Cyclopower™ were compared to standard Manuka honey against a range of common pathogenic organisms using standard measurements of minimum inhibitory (MIC) and bactericidal concentrations (MBC).

Activity against beneficial gastro-intestinal bacteria was also explored. The substrates were added to a basal culture medium at 0.2% (w/v). Twenty seven bacterial species were tested. Following incubation for 24 hours, anaerobically, at 37°C, the optical density (A600) of the cultures was measured against uninoculated blanks. This provides a measure of the amount of bacterial growth. All bacterial cultures were prepared in triplicate.

Clinical tolerability of this product was assessed using single- and multiple dose response studies (using both tablets and capsules) in healthy individuals.

RESULTS AND DISCUSSION

Anti-Inflammatory Activity

Anti-inflammatory activity was observed with both the uncomplexed honey and the Cyclopower™ product (See Fig 1). Both MGO250™ and MGO400™ strength Manuka honeys demonstrated inhibition of TNF-α when measured at 400 mg/ml (29.9% and 15.3%, both p < 0.05 vs control cells (0% inhibition, not shown). The MGO400™ Manuka Cyclopower sample was a strong anti-inflammatory modulator, this being a 3-fold increase in anti-inflammatory activity over than seen with the uncomplexed honey.

Anti-bacterial Activity

Manuka honey completely inhibited Staphylococcus aureus (MSSA and MRSA), Streptococcus pyogenes, Helicobacter pylori and Moraxella catarrhalis at concentrations of 2%-10% w/v. Lower MIC values were observed for several organisms when higher MGO honey was used, and when Manuka honey with Cyclopower was compared to the uncomplexed honey.

Time course growth measurements (using a sublethal concentration of 2% w/v honey) showed that Manuka honey with CycloPower had an increased bacteriostatic action against S. aureus, MRSA and P. aeruginosa compared with uncomplexed Manuka honey.

Pre-Biotic Effects

Manuka Honey with Cyclopower enhanced the growth of commensal bacterial generally accepted as ‘beneficial’ after incubation at physiologically relevant concentrations.

An increase was seen in the populations of bifidobacterial species and their close relative Collinsella aerofaciens. In contrast there was no increase in the potentially pathogenic organism C. difficile.