Antibacterial activity of a herbal preparation to treat sore throats

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Introduction

Sore throats are one of the most commonly seen conditions in general practice. The disease encompasses any upper respiratory tract infection most often caused by viruses or bacteria in which pain in the throat is the predominant symptom.[1] Mostly accompanied by inflammation and swelling of the pharyngeal region. Only about 10–20% of patients with a sore throat are streptococcal positives in the throat. Most patients have viral infections and benefit from symptomatic treatment alone and do not need an antibiotic treatment [2]. An ideal treatment for acute sore throats should have antiinflammatory, antistreptococcal properties and immune modulatory properties. Herbal medicines with all of these properties are needed. In these experiments we investigated the antibacterial activity against bacteria which play an important role in infections of the respiratory tract of a combination of echinacea and sage.

Material & Methods

Tested bacteria strains

Grain positive Grain negative

Staphylococcus aureus ATCC 6538
Klebsiella pneumoniae ATCC 70082
Streptococcus pyogenes ATCC 12244 cln. isolate
Streptococcus pneumoniae ATCC 53100 Neumoplasia influenzae ATCC 19128

Test preparations

Test preparations were an ethanolic fresh plant preparation of Echinacea purpurea (95% herba/5% radix), a fresh plant salvia tincture (DEV=1:17; batch N° 011870), a fresh plant peppermint oil (batch N°2003.03.0225) and the combination of all three preparations which correspond to a combination product for treatment of acute sore throats. The combination consisted of 3,13 % v/v salvia tincture, 4,5 % peppermint oil, 6,4 % echinacea concentrate, 3,5 % Comphurum RH 40, 57,16 % water.

Methods

The determination of the minimal inhibitory concentration and the minimal bactericidal concentration were carried out with the microdilution method.

The kill kinetics can be used to make statements about the time course and the quality of the activity of different concentrations of an antibacterial agent. The test organism is incubated with the active agent and/or the preparation for a defined time period. Characteristic kill curves are obtained by plotting the CFU/ml versus time. A bactericidal effect is considered to have been achieved when 99.9 % of the bacteria in the test preparation have been killed by the antibacterial agent, which corresponds to a reduction by 3 log steps of the microbial density. As reference standard was used here 0,125 % Chlorhexamed which contains 15mg chlorhexidine per 10ml solution.

Results

Figure 1: Minimal bactericidal concentration of echinacea and salvia of their combination

Figure 2: Minimal inhibitory concentration of echinacea and salvia of their combination

Figure 3: Time kill curves of S.pneumoniae for the combination and 0,125 % Chlorhexamed as control. The log 3 reduction time for the combination is 12,5 hours, for chlorhexamed 13 hours.

Conclusions

- The combination of an Echinacea purpurea concentrate with a salvia tincture showed against most of the assessed microorganisms which play a pivotal role of infections of the respiratory tract synergistic effect compared to the single constituents.
- The kill kinetics with S. pneumoniae showed similar results like the reference standard chlorhexidine.
- These results prove that the combination of echinacea and salvia has an antibacterial activity and that it is therefore recommendable for the treatment of sore throats where particularly the prophylaxis of secondary infections is pivotal.

Literature
