Results of all scientific investigations with the A.Vogel Sore Throat Spray

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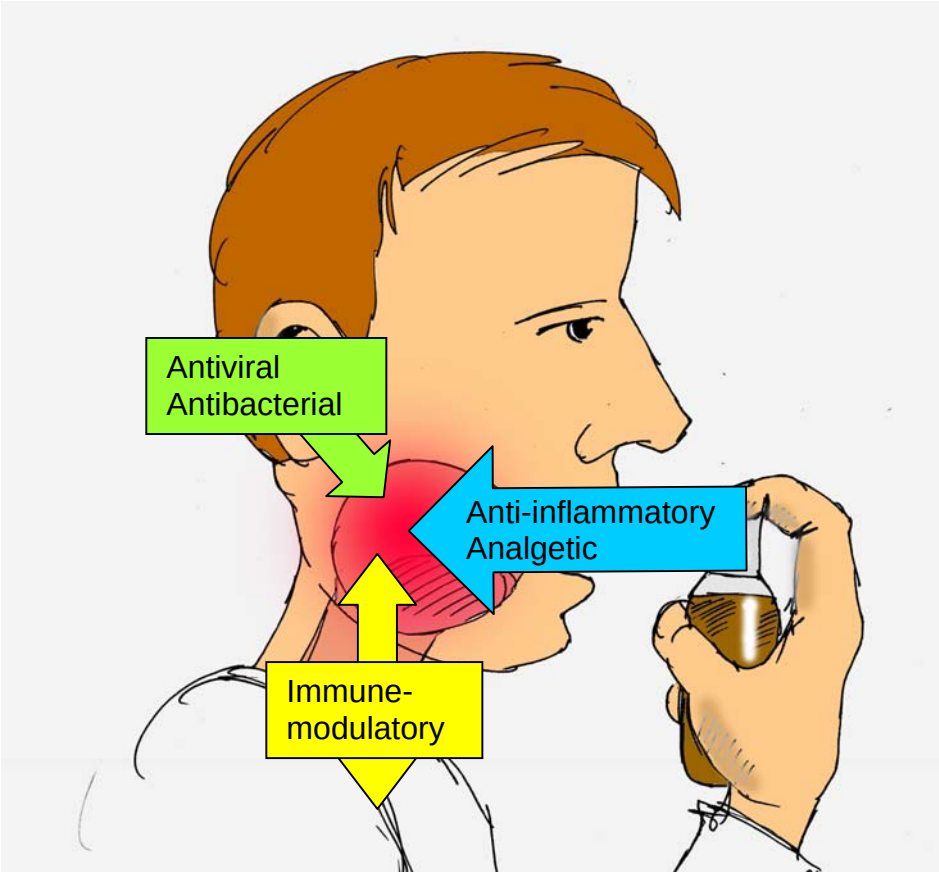

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A.Vogel Sore Throat Spray: The optimal combination of ingredients to treat sore throats

Most sore throats caused by virus infections
Sore throats are a feature of the common cold. They are caused primarily by infection with cold viruses that invade the nasopharynx instead of the nasal epithelium or infect the pharyngeal cavity directly (Eccles, 2005; Attia, 2003)[1]. The second most common cause of sore throat is bacterial infection (Attia, 2003)[2].

A remedy for the treatment of sore throat should therefore be antiviral and then also anti-inflammatory and analgesic. Furthermore, since secondary bacterial infections may also be involved, at least a few days after infection, it is advantageous for a treatment also to have an antibacterial effect.

Synergistic effects of components
The pharmacological effects for which we consider the active substances, Echinacea or Sage, to be chiefly responsible and on the basis of which we selected them for the combination are set out below:

Echinacea:
- Locally antiviral
- Locally antibacterial
- Systemically immunemodulatory and systemically anti-inflammatory

Sage:
- Locally anti-inflammatory
- Locally antibacterial

Both substances have local antibacterial efficacy. But in our experiments we were able to demonstrate that the **combination of Echinacea and Sage is more effective** than the individual substance alone.

Peppermint Oil:
- cooling
- soothing/analgetic effect

Triple Power Combination in short

Peppermint Oil	-> Cooling, soothing, fast pain relief
Sage	-> Anti-inflammatory and antibacterial
Echinacea	-> Antiviral, antibacterial and systemically anti-inflammatory and immunemodulatory

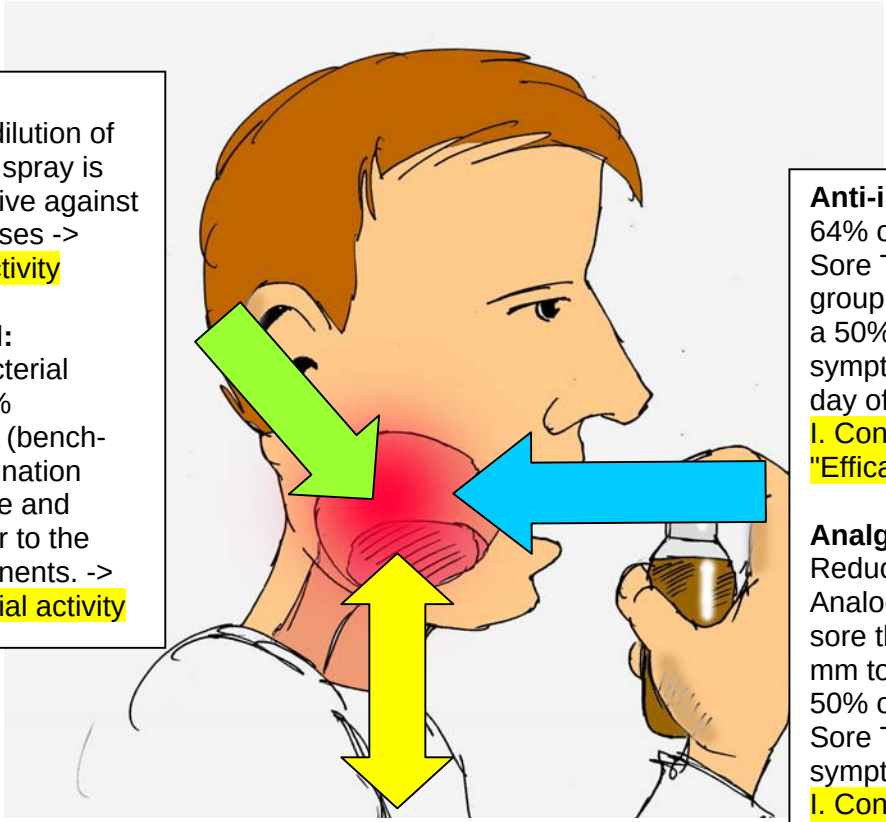
[1] Eccles R. Understanding the symptoms of the common cold and influenza. Lancet Infect Dis. 2005 Nov;5(11):718-25. Review.

[2] Attia MW, Bennett JE. Pediatric pharyngitis. Pediatr Case Rev. 2003 Oct;3(4):203-10.

Overview on studies for A.Vogel Sore Throat Spray

Antiviral:
Already in a dilution of 1:10'000, the spray is 100% protective against influenza viruses -> II. Antiviral activity

Antibacterial:
Same antibacterial effect as 0.5% chlorhexidine (bench-mark). Combination of Echinaforce and Sage superior to the single components. -> III. Antibacterial activity



Anti-inflammatory:
64% of the A.Vogel Sore Throat Study group experienced a 50% reduction of total symptom score on 3rd day of treatment. -> I. Controlled clinical trial "Efficacy"

Analgetic:
Reduction of Visual Analogue Scale VAS for sore throat pain from 73 mm to 7 mm.
50% of the A.Vogel Sore Throat study group symptom-free on day 4.
I. Controlled clinical trial "Efficacy"

Immunemodulatory:
Alkylamides from the Echinaforce component in the spray are bioavailable.
-> IV. Bioavailability trial

I. Controlled clinical trial "Efficacy and Tolerability"

Study title
A multicentre, randomised, double-blind, double-dummy study to assess efficacy and tolerability of the A.Vogel Sore Throat Spray compared to a chlorhexidine/lidocaine (Collunosol) spray in patients with acute sore throats.

Study period
14 February until 21 August 2006

Patients
133 patients analysed

Inclusion Criteria
Men or women aged 12-75 years; Acute pharyngitis or tonsillitis with the following symptoms: throat pain and inflammation of the pharynx and/or tonsils; onset of sore throat less than 72 hours prior to the start of the study; throat pain score equivalent to or greater than 6

Study centres
11 general practitioners in Switzerland

Study medication
A. Vogel Sore Throat Spray or Collunosol (1 mg chlorhexidin/2 mg lidocain; marketleader sore throat sprays in Switzerland)

Dosage
Every 2 hours 2 puffs, up to 10x2 puffs daily

Treatment duration
5 days (or until symptom-free)

Assessment
Patients had to fill out a **diary** during their treatment period. Three times daily they had to assess the following symptoms: throat pain, difficulty in swallowing, salivation, erythema and fever; rated on a 4-point scale: 0 = none, 1 = mild, 2 = moderate, 3 = severe.
At beginning and end of the test, medical examinations by physicians like assessment of pain by VAS (Visual Analogue Scale, from 0 mm = no pain to 100 mm = unsupportable pain).

Emergency medication
As usual for studies where test persons suffer from pain, emergency medication of Ibuprofen tablets 200 mg was allowed, in case the sprays were not sufficient to ease the pain.

1. Demographic Data, Diagnosis and Compliance

In both groups, characteristics were in general comparable. Patients in the Collunosol group were on average younger and experienced more severe symptoms at the beginning.

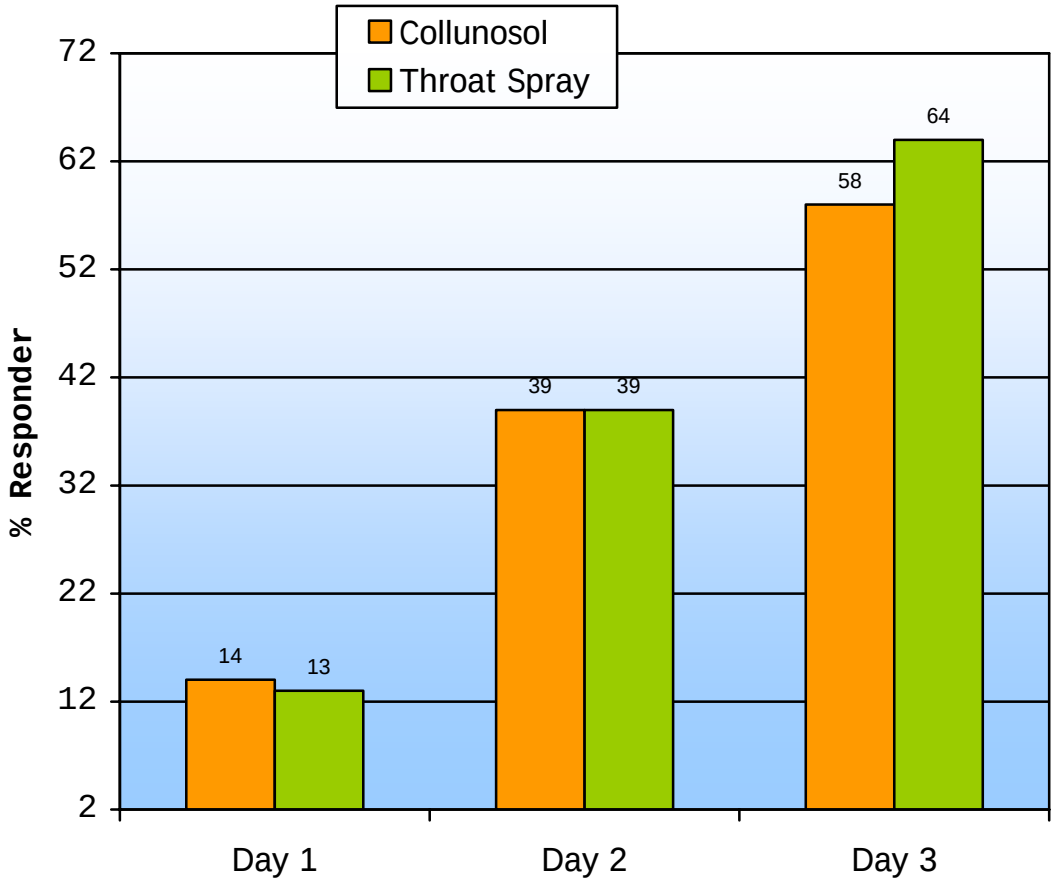
	A.Vogel Sore Throat Spray (N = 69)	Collunosol (N = 64)
Patients	69	64
Age [years], Mean (SD)	41.6 years (± 18.7)	33.8 years (± 13.1)
Male	23 (33.3%)	20 (31.3%)
Female	46 (66.7%)	44 (68.8%)
Sore Throat Score (0-15)	8.8 (± 1.5)	9.5 (± 1.5)
Visual Analogue Scale Pain (VAS)	72.6 (± 17.9)	77.1 (± 19.9)
Mean study duration per patient [d]	5.6 days	6.4 days
Use of emergency medication:		
% patients, which took the emergency medication Ibuprofen tablets 200mg	36%	46.9%
Mean use emergency medication (Ibuprofen tablets 200mg)	6.2	7.0

2. Efficacy

2.1 Responders at day 3 - Goal of the study

The primary parameter of the study was the number of responders in both treatment groups after the first 3 days. (A "responder" to treatment is defined as a clinically significant reduction by 50% compared to the baseline score at treatment start, of the total score of throat pain, difficulty in swallowing, salivation, erythema and fever symptoms (0 = no, 1 = mild, 2 = moderate, 3 = severe symptoms))

Reading example: 64% of the study group "A.Vogel Sore Throat Spray" experienced a 50% reduction of the total symptom score at the 3rd day of the treatment.

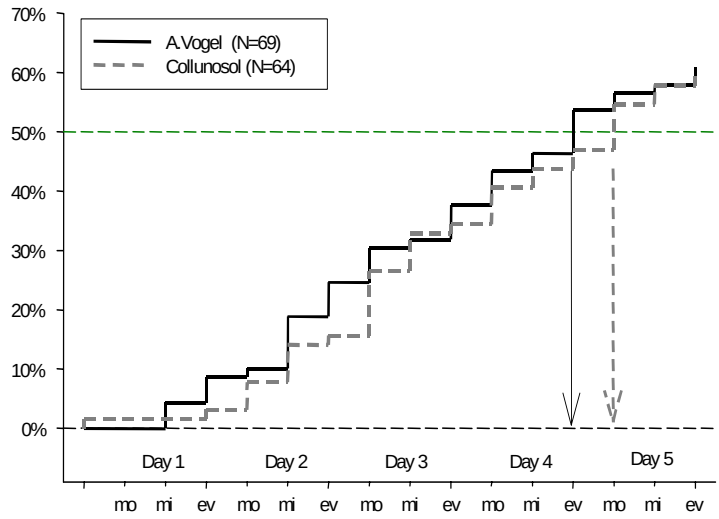


The A.Vogel Sore Throat Spray was as powerful as Collunosol: There was about the same number of responders, statistically no difference.

With this result, the study is successful and clinically it could be proven that the A.Vogel Sore Throat Spray is as effective as Collunosol.

2.2 Time to become symptom-free

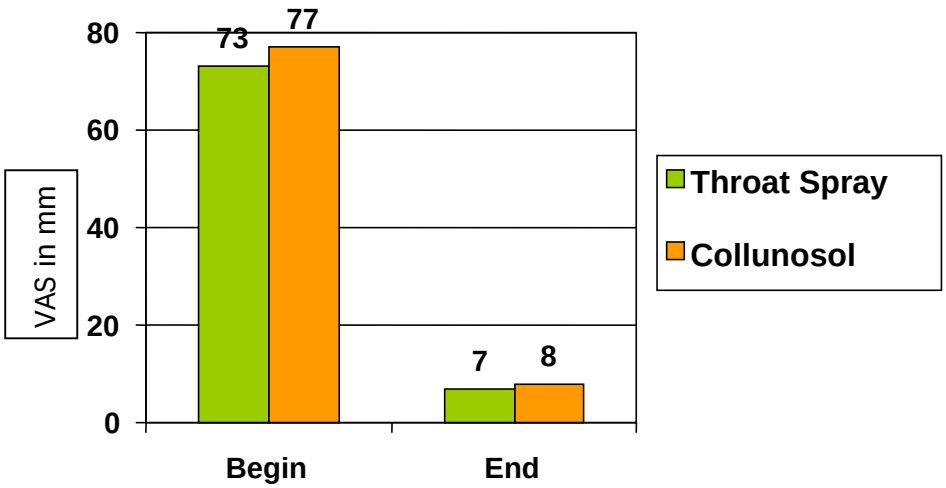
Time to become symptom-free was defined as the time point when less than 2 points in the symptom score was reached.
In the A.Vogel Sore Throat Spray group this parameter was reached by 50% of the patients on the evening of the 4th day, in the Collunosol group on the morning of the 5th day.



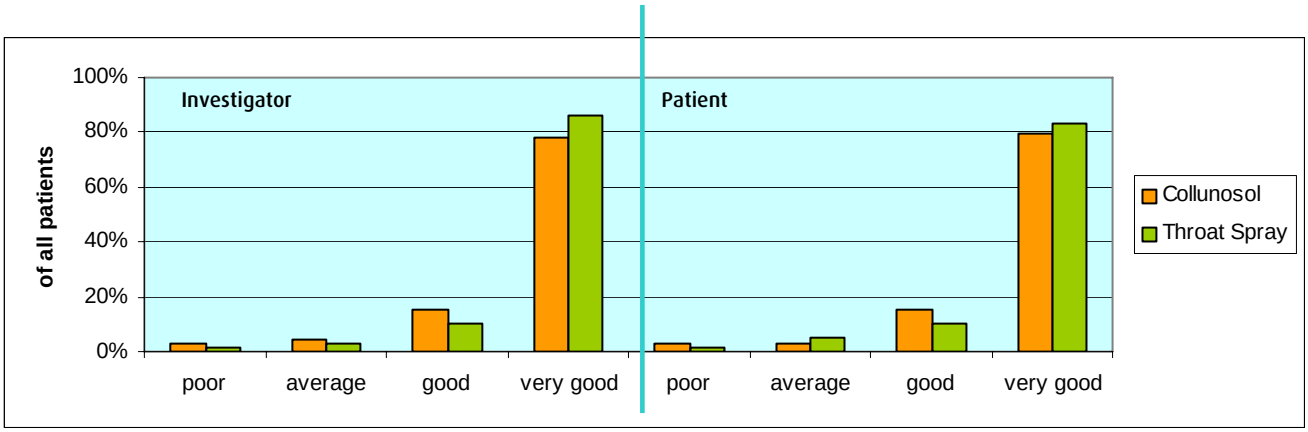
At test end, after 5 days, under Collunosol 56% and under A.Vogel Sore Throat Spray 58% of the patients were symptom-free (no statistical difference).

2.3 VAS (Visual Analogue Scale)

The Visual Analogue Scale VAS for throat pain (0-100mm) changed in the A.Vogel Sore Throat Spray group from 73mm to 7mm and in the Collunosol group from 77mm to 8mm from starting point until the end of the treatment.



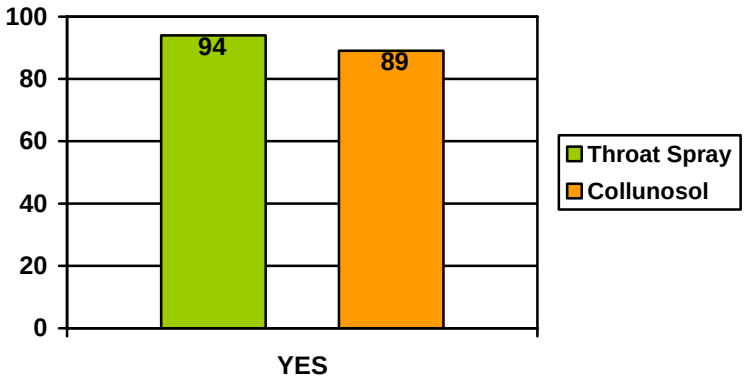
2.4 Assessment of efficacy



Assessment of efficacy by investigator and patient was about the same: Both sprays were rated in almost 90% of the cases as ‘very good’ or 'good'.

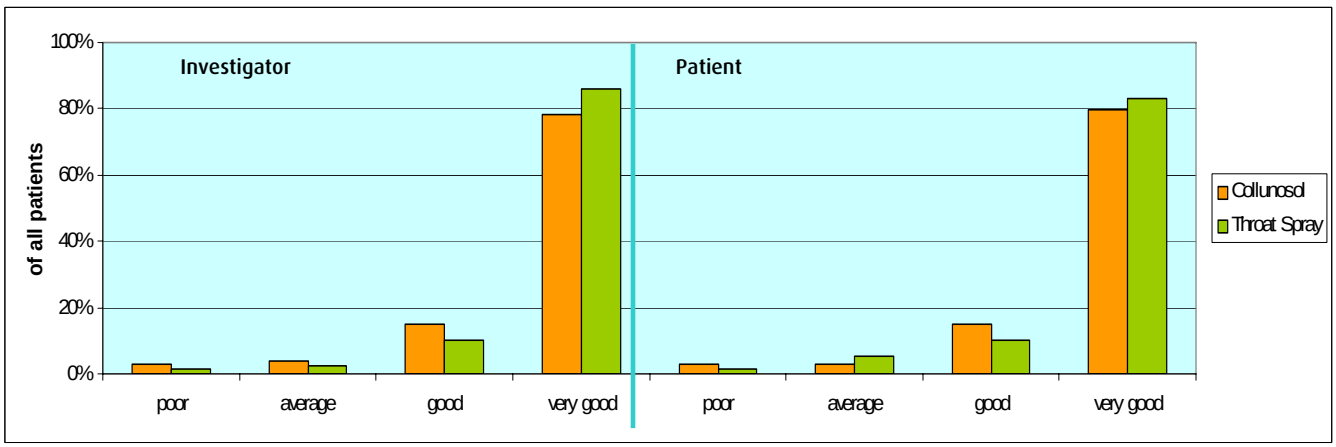
3. Patients like the Spray!

94% of all patients in the A.Vogel Sore Throat Spray group and 89% in the Collunosol group answered YES to the question "Would you use the spray again?".



4. Tolerability

The vast majority of patients and investigators assessed the tolerability as ‚very good’ or ‚good’.



5. Summary

5.1. Proven Effectiveness

The A.Vogel Sore Throat spray is as powerful and effective as the synthetic market leader spray "Collunosol":

- Same responder rate who experienced a 50% reduction of symptoms during all days
- Same pain reduction on VAS pain scale
- Identical rating of efficacy by physicians and patients

5.2. Fast relief

The A.Vogel Sore Throat spray is fast acting:

- Over 50% of the test group experienced a 50% reduction of symptoms on day 3
- Over 50% of the test group was symptom-free on the eve of the 4th day

5.3 High Attractiveness

An overwhelming majority of over 94% of the test group would use the A.Vogel Sore Throat spray again.

II. Investigation of the antiviral activity

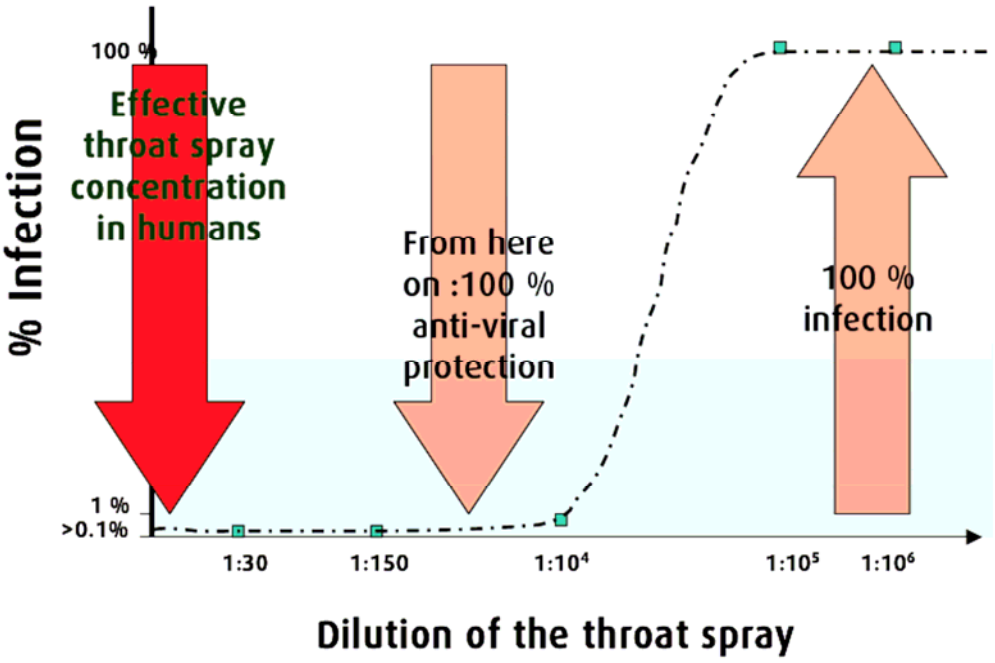
Viruses are the main reason for sore throats. **In these experiments we showed that the A.Vogel Sore Throat Spray can prevent in low concentrations viruses from infecting nasal tissue.**

Study title: Antiviral testing of the A.Vogel Sore Throat Spray in a validated in-vitro model

Investigator: Prof. Hudson, University of Vancouver, Canada

Test system: Tissue cultures which are infected with human influenza virus. Throat spray is added in several concentrations until a 100% antiviral-protective effect is reached which means that no virus can infect the cells any more.

Results:



In a dilution of about 1:10'000, **the A.Vogel Sore Throat Spray is 100% protective against influenza viruses.** The spray in reality is applied in much higher concentrations! Therefore, it can be assumed that the A.Vogel Sore Throat Spray has also a strong antiviral potency – acute and prophylactically.

III. Investigation of the antibacterial activity

Bacteria are an important factor in sore throats. On one hand, they themselves can induce a sore throat, and to the other hand, they are mainly responsible for secondary infections.

Study title: Antibacterial testing of the single compounds of the A.Vogel Sore Throat Spray and its combination **on microorganisms of the respiratory tract**

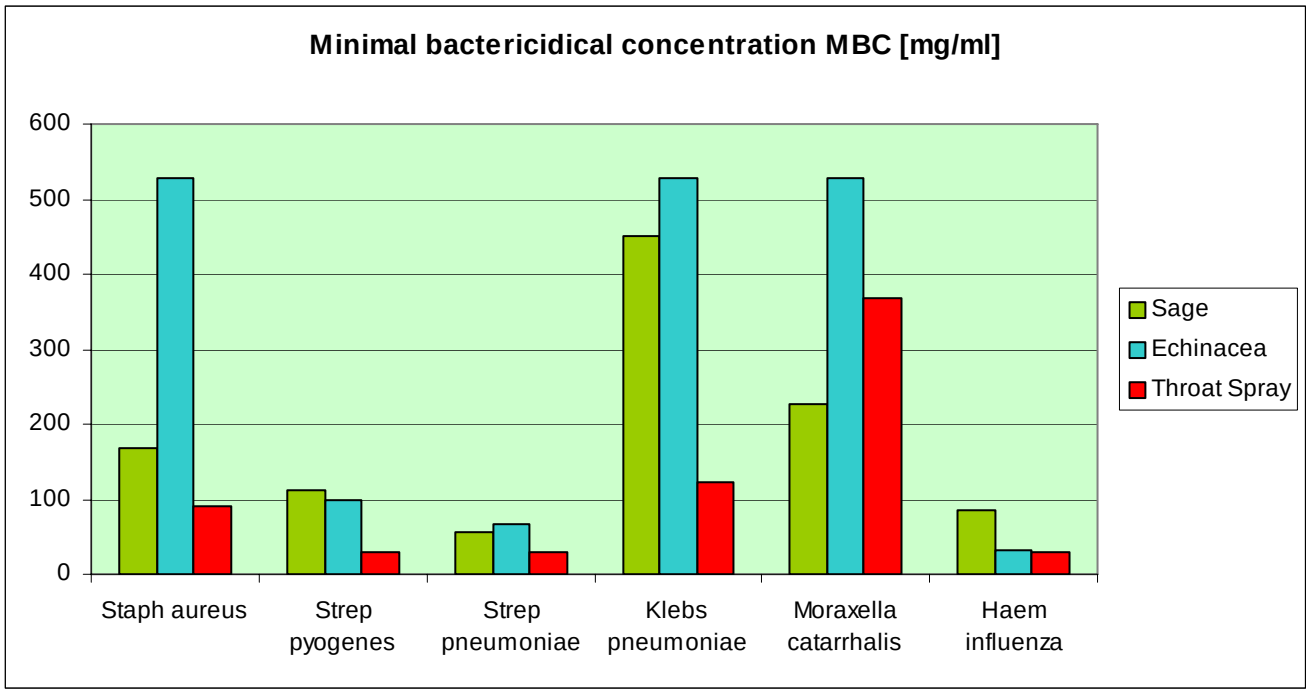
Investigator: Prof. Reichling, University of Heidelberg, Germany

Test system: Investigation of the '*minimal inhibitory concentration (MIC)*' and the *'minimal bactericidal concentration (MBC)'*

Tested bacteria:
Staphylococcus aureus (Occurrence in mucosa, causative organism of infections)
Streptococcus pyogenes (Tonsillitis)
Streptococcus pneumoniae (Infections of airways)
Moraxella catarrhalis (Occurrence in the pharyngeal region)
Haemophilus influenzae (Parasit of the mucosa)
Klebsiella pneumoniae (Sinusitis, pneumonia)

Results:
The combination (= A.Vogel Sore Throat Spray) is more effective than its single constituents (salvia, echinacea, peppermint oil).
It is as effective as 0.5% chlorhexidine which acted as positive control and which is generally used in the treatment of sore throats.

Graph below: Minimal bactericidical concentration (the concentration where the bacteria die off) of the Salvia tincture, Echinacea concentrate and the A.Vogel Sore Throat Spray. The combination acts superior to the single constituents:



IV. Bioavailability trial

In this trial we investigated if the active constituents of Echinaforce, the alkylamides, can be found in the blood of the applicants after application of the A.Vogel Sore Throat Spray.

Study title: Bioavailability and Pharmacokinetic studies on A.Vogel Sore Throat Spray

Study period: March - April 2006

Patients: 8 healthy young volunteers (4 women/4 men). Each volunteer received 4.4 ml of a new A.Vogel Sore Throat Spray, applied as puffs.

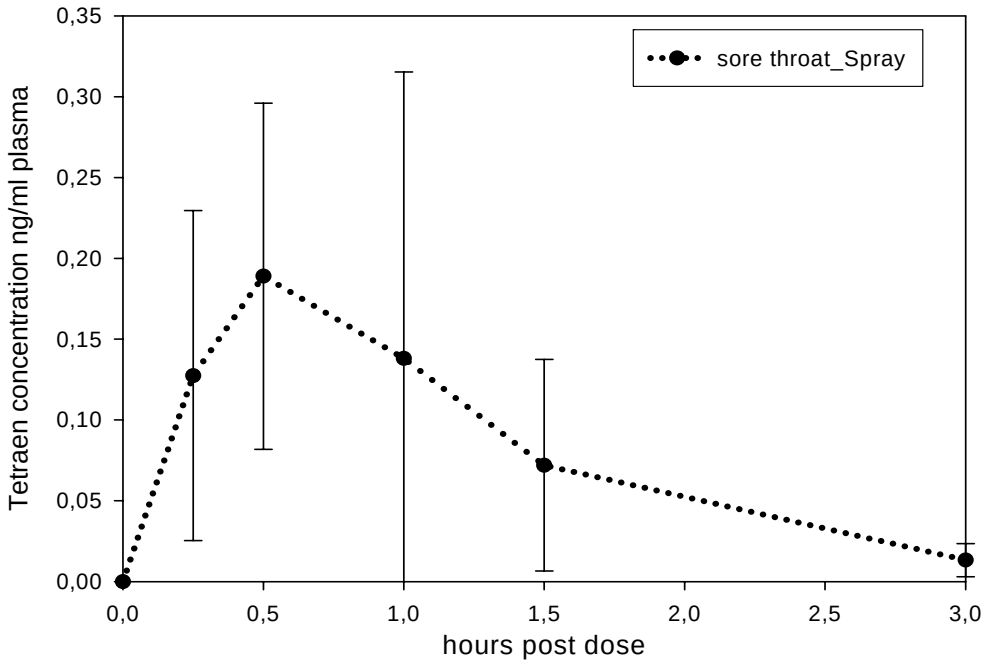
Study centre: Institute of Pharmacy, University of Graz, Austria (Prof. Bauer, Dr. Woelkart)

Study medication: A.Vogel Sore Throat Spray

Time points of taking blood: 0, 15, 30, 60, 90, and 180 min

Method: Analytical determination of dodeca-2E,4E,8Z,10E/Z-tetraenoic acid isobutylamides (tetraene), the main alkylamide of Echinacea, in blood serum

Results



The maximal concentration of the tetraen (main alkylamide of Echinacea) was 2.3 ng/ml, found after 54.6 min. **These data show that the alkylamides from the Echinaforce component of the A.Vogel Sore Throat Spray are bioavailable and the spray acts also in an immunemodulatory manner.** - This result presents a great benefit in the treatment of sore throats compared to synthetical standard treatments without any influence on the immune system.