

Specific Selection of Essential Oil Compounds for Infectious Disease Treatment of Children

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Selected essential oils and their dosages applied in the therapy of infectious diseases of children have recently been documented (1). However, information is only sparingly available about practical experiences in the treatment of such infections with pure essential oil compounds (2).

To find out safe essential oil compounds with antimicrobial activity, an existing database (3), which schedules *in vitro* inhibitory data of natural compounds towards microorganisms, was supplemented with toxicological data (4). These consist of the oral toxicity towards rats or mice and of the dermal toxicity towards rabbits. Both, the inhibitory and toxicological data are combined to calculate oral and dermal therapeutical index (TI) values. Causative microorganisms of infectious diseases of children are respected in this evaluation. Among antimicrobial data only such are applicable, which have been obtained in agar or serial dilution tests. Oral toxicity data are known from 28% and dermal toxicity data from 16% of 3000 compounds being present in the database.

The comparison between oral TIs of natural antimicrobials and such of medicinal relevant antibiotics revealed obvious differences, at which the efficiency of natural antimicrobials is superimposed commonly by antibiotics. This suggests that oral administration of essential oil compounds is not suitable to cure severe infections. By means of TI calculations some few essential oil compounds turned out to be as moderate efficient in the inhibition of gram-positive bacteria *in vitro*, but *in vivo* studies are needed to characterize their therapeutic value more precisely.

A comparison of dermal TIs of antibiotics with those of natural compounds is aggravating due to the lack of dermal toxicity data of almost all antibiotics and of many natural compounds. The respective calculations selected a few essential oil compounds being efficient against *Staphylococcus aureus*, which is responsible among others for skin infections. This implies a topical treatment of such infections with selected compounds from essential oils.

Among all compound groups analyzed the sesquiterpene alcohols, e.g. *alpha*-bisabolol from chamomile oil, yielded the most striking results. Therefore, it seems worthy to examine the antimicrobial resources of natural compounds more in detail and to evaluate those findings by use of toxicological data.

References

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