

USING TEA TREE OIL FOR HYGIENIC MASSAGE PRACTICE

Nozomi DONOYAMA¹⁾ M.S., Tetsuji WAKUDA¹⁾ M.A., Tadashi TANITSU²⁾, Yoshitoshi
ICHIMAN¹⁾ Ph.D.

1) Department of Acupuncture and Moxibustion, Tsukuba College of Technology

2) Tsukuba College of Technology Clinic

Correspondence:

Nozomi DONOYAMA

Tsukuba College of Technology

4-12-7 Kasuga, Tsukuba, Ibaraki, Japan

305-0821

tel: 029-858-9631

fax: 029-855-1745

e-mail: esperance.dono@nifty.com

ABSTRACT

Objective: The essential oil tea tree oil (TTO) possesses powerful antibacterial activity and many aromatherapists in Japan use it for preventing infection during foot massage.

Thus, whether massage is more hygienic using oil with added TTO was evaluated.

Design: Massage sessions were conducted using different oils as lubricant; 3% TTO (TTO diluted to 3% v/v with Jojoba oil base), 6% TTO, 3% lavender oil (LO), 6% LO and Jojoba oil without any essential oil added as control. Samples were taken from the therapist's palms and client's skin, then surviving bacteria were counted. Also, to clarify the growth inhibition effect on bacteria, 4.80×10^3 colony forming units (CFU) of *Staphylococcus aureus* was added to the 5 kinds of oils used as lubricants, undiluted TTO, and undiluted LO, and reduction of bacterial survival count measured.

Results: Bacterial count on the therapist's palms increased and that on the client's skin decreased after 10-min. and 20-min. massage. Bacterial count was dependent on concentration of essential oils, however this tendency was not special on TTO. Using undiluted TTO and LO in bacterial growth experiments, no multiplication of the organisms was observed, but this effect was not complete using diluted TTO and LO.

Conclusion: Undiluted TTO had antibacterial activity against *S. aureus in vitro*, however, it could not be demonstrated that it was effective to use the oil added TTO as

lubricant for the purpose of hygienic massage practice.

keywords: bacterial count, hygienic massage practice, tea tree oil, lavender oil, antibacterial effect, aromatherapy

INTRODUCTION

Number of bacteria removing between the therapist's palms and client's skin during a massage session is dependent on the lubricant used (Donoyama *et al.* 2004). When using oil as lubricant, the rate of bacteria exposure on the therapist's palms was higher and the rate of elimination of bacteria after hand washing at the completion of massage was also higher compared to other kinds of lubricants used in the study. Using oil as lubricant for massage was more hygienic than other kinds of lubricants. Antibacterial effect of some of essential oils were shown in previous studies (Franchomme P *et al.* 1996). Antibacterial activity of tea tree oil has been compared with that of many other essential oils and some have been shown to have comparable or superior activity (Williams and Home, 1995, Williams, 1996). Several aromatherapists in Japan often use tea tree oil (TTO) for foot massage in order to prevent infection during massage practice, however, a

Medline search did not identify any scientific studies indicating TTO as effective for preventing infection during massage practice. In this study TTO was evaluated for level hygiene in massage. The theme of this series of our studies is to determine how to practice massage hygienically, as therapists' hands are directly in contact with client skin.

MATERIALS AND METHODS

This study consisted of Experiment I and II, performed in September, 2003.

Experiment I

Participants: A 22-year-old healthy male was recruited as the massage subject. The massage therapist was a female with a massage practitioner national license and treatment experience of more than 15 years.

Procedure: Changes in bacterial count during massage sessions using different oils were compared.

Experimental procedures were identical to Donoyama *et al.* 2004: After the subject entered the laboratory, lied on the bed in a prone position, exposing the skin below the knee joint, and took a rest for 15 minutes, then massage was conducted. Before giving the massage, the therapist washed her hands according to the guideline (Centers for Disease Control, 1998); she washed her hands using Hibisclub®(chlorhexidine gluconate; Sumitomo Pharmaceuticals, Osaka, Japan), brushing nails with flowing water

two times, then wiped her hands with disposable paper towels and finally disinfected her hands with rubbing Hibiscole® (chlorhexidine gluconate; Saraya Company, Osaka, Japan). The massage session consisted of stroking, kneading and pressing on skin directly to the posterior portion of the right lower leg and the plantar side of the right foot for 20 minutes.

In this experiment, Jojoba oil (*Simmondsia chinensis*, *Simmondsia californica nuttall*, Mitsuba Trading Company, Tokyo) was used as base oil for lubrication and an essential oil was added to it. Tea tree oil (TTO, *Melaleuca alternifolia*, Fragrance journal Ltd., Tokyo) reported to have powerful antibacterial activity, and lavender oil (LO, *Lavandula angustifolia vera*, L'occitan, France) with no specifically emphasized antibacterial activity were used as essential oils. Five massage sessions using different lubricant compositions were compared (3% TTO, 6% TTO, 3% LO, 6% LO, and only jojoba oil without any essential oil as control). Each massage session was conducted on a different day.

Bacteria samples were taken from the therapist's palms using Palm stamp agar (Nikken Biomedical Laboratory Company, Kyoto, Japan) and from the skin of the subject using Food stamp agar (Nissui Company, Tokyo, Japan). Bacteria samples from the subject were taken from three 10cm² points on the skin where massage was given; the plantar surface of the metatarsophalangeal joint of the large toe, the highest and thickest

point of the gastrocnemius and the center of the popliteal fossa.

Bacteria samples from both the therapist and the subject were taken at three time points; before massage, after a 10-minute massage and after a 20-minute massage. Immediately after the massage session, the therapist washed her hands under flowing water for 20 seconds without any kind of soap or disinfectant and bacteria samples were taken again. Bacteria samples were incubated at 37°C for 48 hours. Colony Forming Units (CFU) were counted.

Experiment II

To clarify bacterial growth inhibition effect, 4.80×10^3 CFU of strain ATCC-25923 of *Staphylococcus aureus* was added to the 5 kinds of lubricant compositions used in Experiment I, undiluted TTO and undiluted LO, then reduction of bacterial survival count was investigated after 10 and 20 minutes.

RESULTS

Fig. 1 shows changes in bacterial count on the therapist's palms before, after 10-min. massage, after 20-min. massage and after hand washing, using a log scale. Bacterial count increased with massage time and decreased after hand washing with flowing water. TTO was not found to decrease bacterial count specially. Designating bacterial count before massage as 100%, after 20-min. massage, bacterial count on the client's skin was 22.8%, 4.0%, 19.7% and 3.4%, using 3% TTO, 6% TTO, 3%

LO and 6% LO solutions, respectively compared to 47.8% using jojoba oil without essential oils (control). These results indicate bacterial count is reduced, depending on essential oil concentration, however, it was not clear that TTO reduced bacterial count specially. In Experiment II, no multiplication of the organisms was noted after 10 and 20 minutes with both undiluted TTO and undiluted LO, however after 20 minutes was 2.80×10^3 , 2.10×10^3 , 1.70×10^3 and 7.00×10^2 CFU in 3% TTO, 6% TTO, 3% LO and 6% LO solutions, respectively.

DISCUSSION

Results of Experiment I and II, demonstrate that undiluted TTO has an antibacterial effect against *S. aureus* and growth inhibition by TTO correlated with its concentration. Previous *in vitro* studies of TTO (Franchomme *et al.* 1996) demonstrated powerful antibacterial activity, however results of this study with *S. aureus* indicate TTO has no greater antibacterial effect than LO, similar to the result of a study by Inoue (2003). In other words, despite TTO itself having antibacterial activity, it is thought that the efficacy becomes lower when TTO is diluted into base oil as massage lubricant. Recent studies (Remmal *et al.* 1993, Hammer *et al.* 1999, Cox *et al.* 2001) indicated that surfactants, interfering substances and emulsifying agents compromised the antimicrobial activity of TTO. Hammer *et al.* (1996) suggested that TTO might be useful in removing transient skin flora while suppressing but maintaining resident flora. From these results, use of the essential oil TTO diluted in base oil as lubricant cannot be recommended as an effective way to prevent infection during

massage sessions.

Aromatherapy in Japan was brought from Britain and its benefit is thought to be due to the functions of essential oils and from the therapeutic mechanism of massage (Price 1987). In contrast, some aromatherapists in France, Germany and other European countries, give essential oils to clients by ingestion or inhalation, as they doubt the effectiveness of essential oils through massage. It is thought results from studies on efficacy of essential oils *in vitro* developed in France have been confusing for some Japanese aromatherapists. Some of other essential oils are also studied antibacterial effect *in vitro* so that some of them may be effective to prevent infection during massage sessions. Possibility to use them for hygienic massage will be continued studying. In conclusion, at present, these results suggest that it is important for massage therapists to wash their hands before and after massage sessions for the purpose of hygienic massage practice.

ACKNOWLEDGEMENTS

We would like to thank Fragrance Journal Ltd. and Mitsuba Trading Company for kindly providing Australian tea tree oil and Jojoba oil, respectively.

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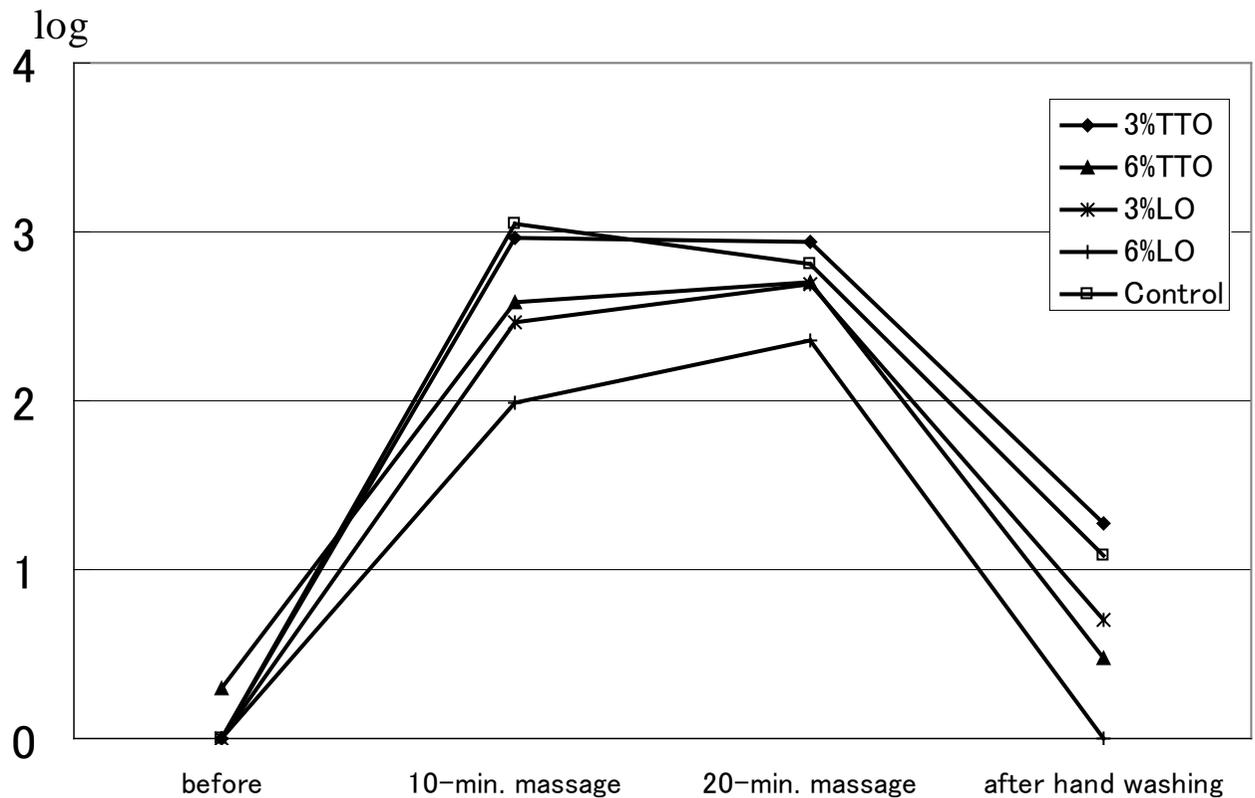
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**Fig.1 Changes in Bacterial Survival Count
on Therapist's Palms**

TTO means tea tree oil, LO means lavender oil