A Study on the Effects of Safety and Facial Lymph Drainage(FLD) of Sandalwood Essential Oil on the Skin Status in the Human Skin Cell Line

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This study measured basic physiological activities in keratinocyte and dermal fibroblasts of human HaCaT cells through the cell viability test of sandalwood essential oil. The results confirmed the safety of sandalwood essential oil. Clinical research on the effects on facial skin conditions was conducted with university students in their early twenties who thought that they had redness or sensitive or problem skin. The subjects were classified into the control group without any treatment, the oil group treated by manual lymph drainage(MLD) using jojoba oil, and the aroma group with treated by manual lymph drainage using the combination of jojoba oil and sandalwood essential oil. The results suggested that while the control group decreased in both moisture and sebum levels, the oil group and the aroma group showed a significant difference in a moisture level at p<.05 and p<.001 respectively and maintained a normal sebum level. It indicated an excellent effect on skin.

This study suggested a more effective method in the skin care program for problem skin by treating MLD using sandalwood essential oil.

Key words: Human HaCaT Cells, Dermal fibroblasts, Keratinocyte, Manual lymph drainage(MLD), Sandalwood essential oil, Moisture, Sebum.

I. Introduction

With a rapid industrial and economic growth and people's increase in a life awareness level in Korea, the skin care and beauty industry has been greatly grown. Since 1990 when the Department of Cosmetology was established in colleges, professional and systematic beauty education has been provided based on academic establishment and skin care and beauty which began with an associate degree has been greatly developed into a bachelor, a master, and a doctor. However, some limitations occurred in actual management methods in skin care shops while skin care and beauty was grown into a professional field. For example, a meridian massage representative of a chiropractic therapy in Korea was no longer used in the skin care and beauty field due to a violation of the medical law.

In Korea, a skin care therapy certificate was created in 2008. A hand care adopted was manual technique(Swedish massage) and manual lymph drainage(MLD), often called as 'lymph drainage' in the national qualification. Lymph drainage(manual lymph drainage, MLD) is a way to drain lymph using hands. It was named by Dr. Emill Voder, a founder and has widely been used in the medical and beauty fields in the world(Kim, 2000).

Clinical results on an acne were published in the exhibition held under the theme of healthy and beauty(Sante et Beaute) in Paris, France in 1936. Reported as an innovative skin care technique in the beauty circle, it aroused people's great attention and became popular(Sim, 2007).

MLD includes stationary circles, rotary technique, pump technique, and scoop technique.
using a mild hand action applied to a face, pump technique using a deep hand action applied to arms and legs, and massage technique in the direction of lymph at the same speed of the pulse or heart rate using stationary circles and rotary technique (15-40 mmHg) (Kwon et al., 2002; Wittlinger et al., 2004). It is very efficacious to remove water and wastes stagnated in connective tissues and toxins, maintain the balance of the autonomic nervous system, relieve pain, and reinforce immune functions. It is also effective for congestive flushing and erythema such as rosacea of sensitive skin, facial erythrosis, couperose skin, and haematomas and facial oedema (Min, 2009).

Previous studies reported the followings. The result of lymph massage in sensitive skin showed the synergy effect of sebum, moisture, and elasticity with an increase in an experiment frequency (Kim, 2010) and the result of the effects of facial MLD on electroenic ephalography (EEG) and electrocardiogram (ECG) showed that facial MLD led to sleep and had positive effects from an electro-physiologic view of brain and heart (Yun and Choi, 2012). The result of the effects of MLD on a decrease in stress and edema after facial plastic surgery suggested that it maximized effects during a recovery period after plastic surgery with mental and physiologic stability and satisfied surgery results. Also, the result of the effects of MLD on changes in cortisol, attention quotient, and an anti-stress level in office workers (Lee and Han, 2012) and the effects of MLD on leg edema caused by high-heeled shoes (Lee et al., 2012) showed very good relief effects.

The aroma therapy area has kept the aesthetic aroma therapy area by being actually combined with a variety of massage techniques by beauty therapists and grown more greatly than other areas (Koh, 2006). Jojoba oil is ideal thanks to its molecular stability and natural moisture supply in aroma application and quickly absorbed with similarity to a sebum component (Salvatore et al., 2008). It is good for dry, oily, and sensitive skin all and solidified in a very cold place or a refrigerator and liquefied at 100°C (Kim, 2006).

The scientific name of sandalwood essential oil is Santalum album and a Santalum species includes Santalum album, Santalum spicatum, Santalum lanceolatum, etc. Santalum album is an evergreen arbor, 9m high and grown in the tropical zone in Asia such as India, Sri Lanka, Malaysia, Indonesia, and Taiwan. Sandalwood essential oil is used as a flavor in the food industry and consumed 0.0074mg/kg a day. Main ingredients revealed are more than 100 kinds (Kwon, 2008). In the previous study of "the effects of sandalwood essential oil on the production of iNOS expression and pro-inflammatory cytokines", this researcher reported that sandalwood essential oil inhibited LPS-induced NO production, the expression of iNOS protein and gene, and TNF-α secretion which is pro-inflammatory cytokines in the RAW 264.7 cell (Park and Jung, 2013) and aroma therapy using sandalwood essential oil had positive effects on the relief and prevention of stress.

Heuberger examined the effects of inhalation of santalol, which is one of main ingredients of sandalwood oil, on blood oxygen saturation, respiratory rate, pulse, skin conductivity, body temperature, blood pressure, sEMG, and arousal