Thesis Title	The Efficacy of Poly-D, L-Lactic Acid (PDLLA) for Hand Rejuvenation
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ABSTRACT

Hand rejuvenation, essential for a natural look in cosmetic procedures, is often overlooked despite hands being highly visible and prone to aging signs like prominent veins and tendons due to subcutaneous atrophy. Aging hands show atrophy, volume loss, and skin changes such as wrinkles and pigmentation issues, becoming noticeable from the fourth decade of life due to UV exposure, pollutants, and stress.

Autologous fat grafting and dermal fillers are key techniques for restoring youthful volume and skin quality. Fat grafting, refined since the 1980s, offers natural, long-lasting results but is complex and time-consuming. Common dermal fillers like hyaluronic acid, polynucleotides, calcium hydroxylapatite (CaHA) which is FDA-approved in 2015, and poly-lactic acid (PLA) stimulate collagen synthesis and augment skin volume.

While other dermal fillers are well researched, PDLLA still remains questionable on efficacy for hand rejuvenation

Objective: The study aims to evaluate the efficacy of poly-D,L-lactic acid (PDLLA) for hand rejuvenation, improving hand elasticity, melanin levels, transepidermal water loss, oiliness, and moisture levels.

Material and Methods: 15 thai women and men volunteers, age between 45-65 years old were enrolled in this study. Hands of each participant were treated with Poly-D, L-lactic acid (PDLLA). All volunteers were treated for 2 times with spacing 4 weeks interval and following up 3 times with spacing 4 weeks interval. The level of smoothness, wrinkle, elasticity, melanin, moisture, oiliness, transepidermal water loss were measured at every visit. Moreover, the patient satisfaction score and the side effect were recorded.

Results: Statistically significant improvements were observed in hydration (from 41.8 ± 10.5 to 55.5 ± 11.1; $P < 0.001$) and TEWL (from 23.5 ± 16.0 to 20.6 ± 16.6; $P = 0.048$)

by week 16, indicating improved skin barrier function. Elasticity showed the greatest improvement, rising from 0.82 ± 0.04 at baseline to 1.00 ± 0.03 at week 16 ($P < 0.001$), with a mean percentage change of 21.51 ± 7.92. Melanin levels decreased significantly at week 12 ($P = 0.049$), although percentage changes were not statistically significant. Oiliness fluctuated transiently, peaking at week 12 ($P = 0.040$) and normalizing by week 16. Adverse effects were minimal and self-limiting, with no reported cases of scarring or dyspigmentation. Satisfaction scores significantly improved in smoothness ($P = 0.01$), wrinkle reduction ($P = 0.01$), and moisture ($P = 0.03$).

Conclusions: PDLLA is a safe and effective biostimulatory filler for hand rejuvenation, demonstrating significant improvements in skin hydration, elasticity, and patient satisfaction with minimal side effects. These findings support its clinical application in aesthetic dermatology for hand aging.

Keywords: Poly-D,L-lactic Acid (PDLLA), Hand Rejuvenation