The efficacy and safety of 1064 nm Nd:YAG laser in the treatment of onychomycosis

Rungsima Wanitphakdeedecha, M.D., M.A., M.Sc.
Department of Dermatology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, THAILAND

SUMMARY

Onychomycosis is common nail disease, especially in elderly. Currently, there are various options to treat onychomycosis; however, their limitations include high failure rate, time-consuming, pricing, and high risk of drug interaction. Previous studies about treatment of dermatophyte onychomycosis with long-pulsed 1064 nm Nd:YAG laser demonstrated excellent outcome without severe side effects [1,2].

Therefore, we conducted the study to evaluate mycological results and side effects of onychomycosis treatment with long-pulsed1064 nm Nd:YAG laser.

92 onychomycotic nails will be recruited in the study. All nails will be treated with long-pulsed 1064 nm Nd:YAG laser (Dualis SP; Fotona, Slovenia) for four sessions at one-week interval. Treatment parameters will be set with fluences in the range of 35-45 J/cm2, a spot size of 4 mm diameter, pulse duration of 30-35 ms, and frequency of 1 Hz. Mycological results (Potassium Hydroxide examination and fungal culture) will be taken every week during the course of treatment. If the latter results (Potassium Hydroxide examination and/or fungal culture) showed positive pathogenic organism, the second cycle would be done. On the other hand, if they were negative results, each nails would be followed up at 3-month and 6-month visits after complete treatment protocol. In case of resistance (positive pathogenic organism after complete 2nd cycle of treatment), onychomycotic nails were discontinued to the study and treated with standard methods.

Until now, the study has not yet been complete. 59 nails were enrolled and received laser treatments. 54 nails were completed with first cycle of treatment and 23 nails (42.59%) demonstrated mycological clearance at 1-month follow up. 31 in 54 nails (57.41%) showed positive pathogenic organism and then received second cycle of treatment. (Figure 1)

After the second cycle of treatment was done, 27 nails were attached to the study and mycological results were negative in 9 nails (33.33%). All nails were followed-up at 3-month and 6-month visits after coplete treatment protocol (1 or 2 cycles of laser treatment) and the final results will be presented in the meeting.

In conclusion, long-pulsed 1064 nm Nd:YAG laser therapy is safe and effective in treatment of onychomycosis. However, larger sample size and longer follow-up term are needed.

REFERENCES

1. Kozarev J, Vizintin Z. Novel laser therapy in treatment of onychomycosis. Journal of Laser and Health Academy 2010; 2010(1): 1-8.
2. Hochman LG. Laser treatment of onychomycosis using a novel 0.65-millisecond pulsed Nd:YAG 1064-nm laser. J Cosmet Laser Ther 2011; 13(1): 2-5

Fig. 1: Onychomycotic nail treated with long-pulsed 1064 nm Nd:YAG laser (a) before, (b) 1 month, (3) 3 months, and (d) 6 months follow-up after laser treatments.