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Home-based contact immunotherapy with diphenylcyclopropenone improves compliance with the recommended follow-up for patients with alopecia areata: A retrospective cohort study

To the Editor: Contact immunotherapy (CI) is widely used to treat extensive alopecia areata (AA).[1] However, it requires administration every 1 to 2 weeks, imposing temporal and financial burdens on patients.[2,3] We previously introduced home-based CI to reduce these burdens and it was as effective and safe as the clinic-based treatment.[4] Herein we analyze whether the home-based treatment improves follow-up compliance compared with the clinic-based treatment.

We reviewed the medical records of 840 patients with AA who underwent CI using diphenylcyclopropenone between May 1995 and March 2018. We collected data regarding the patients' sex, age, date of switching to home-based treatment, and date of the last visit. We recorded the roadway distance from patients' residences to the clinic using an Internet map service (https://maps.naver.com). Of the 840 patients, 66 switched to home-based treatment, of whom 15 were excluded owing to incomplete or missing data in the medical records or remaining unmatched in the 1:3 randomized matching (by age and sex). Finally, 51 patients who switched treatments (switched group) and 153 patients who did not switch treatment (unswitched group) were included in the analysis.

In the Kaplan-Meier analysis, the rate for loss to follow-up (no revisits in >180 days) was significantly lower in the switched group (Fig 1). In the incremental area under the curve analysis according to visiting distance (full data not shown), >35 km (>21.75 mi) was the best predictor of loss to follow-up (hazard ratio coefficient, 1.574; 95% confidence interval, 1.092-2.270; incremental area under the curve, 0.549). A Kaplan-Meier analysis was performed for the 4 subgroups (Fig 2) derived from the 2 groups by the 35-km distance. In the unswitched group, the subgroup with a visiting distance >35 km had a significantly higher loss-to-follow-up rate. However, in the home-based treatment group, the loss-to-follow-up rate did not increase even with greater distances. Therefore, >35 km may be the optimal distance for recommending home-based treatment to reduce the possibility of loss to follow-up.

We demonstrated the advantage of home-based CI for follow-up compliance. The switched group had a lower loss-to-follow-up rate and maintained follow-up even with greater visiting distances.

Prolonged treatment is often required in AA management. Diphenylcyclopropenone maintenance treatment reduces the recurrence rate[5]; however, long-term treatment requires strong patient compliance. Factors that reduce the compliance rate include adverse effects and lower treatment response, but temporal and financial burdens are also important contributors.[4] Home-based treatment may effectively reduce these burdens and assist in maintaining both treatment and compliance.

Generally, the possibility of loss to follow-up increases with long visiting distances that require more time to visit the clinic. Home-based treatment reduces these burdens more effectively with greater visiting distances. We proposed the concept of an optimal distance to actively consider a home-based treatment. Establishing optimal distances for each clinic can help in deciding the appropriate treatment method. Limitations of this study include the small sample size and retrospective design.

In conclusion, home-based treatment improves the follow-up compliance of patients treated with CI.

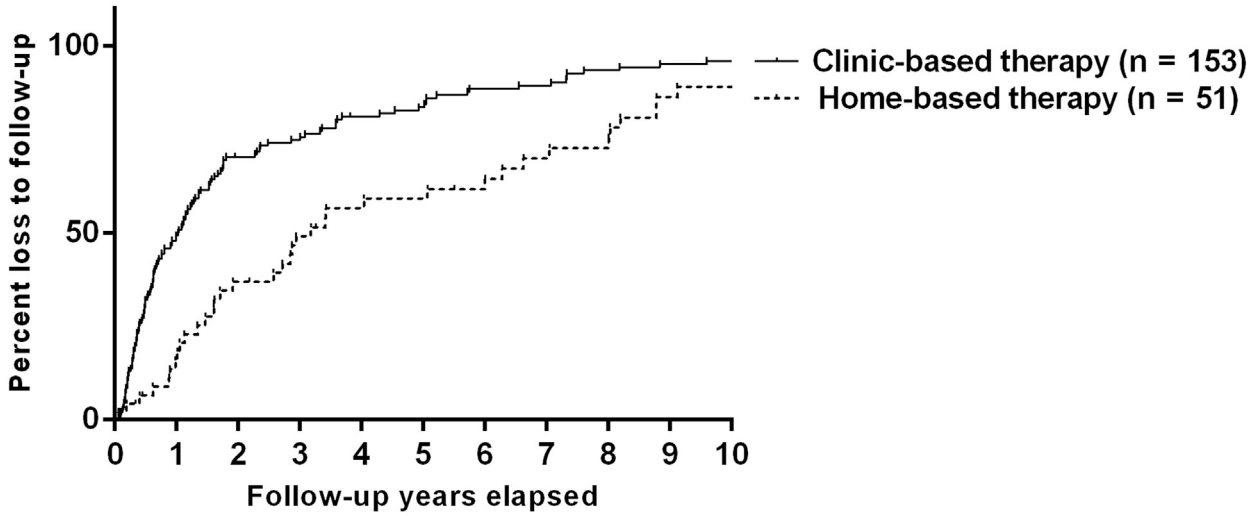

Fig 1. Kaplan-Meier analysis of the loss-to-follow-up rate over a 10-year observation period for comparison between home-based and clinic-based treatment groups. The loss-to-follow-up rate was significantly lower in the home-based treatment (switched) group than in the clinic-based treatment (unswitched) group ($P < .001$ in the log-rank test; hazard ratio, 0.529; 95% confidence interval, 0.367-0.761 in the Cox regression analysis). All statistical analyses were performed using R 3.4.1 (R Foundation for Statistical Computing, Vienna, Austria). P values $< .05$ were considered statistically significant.

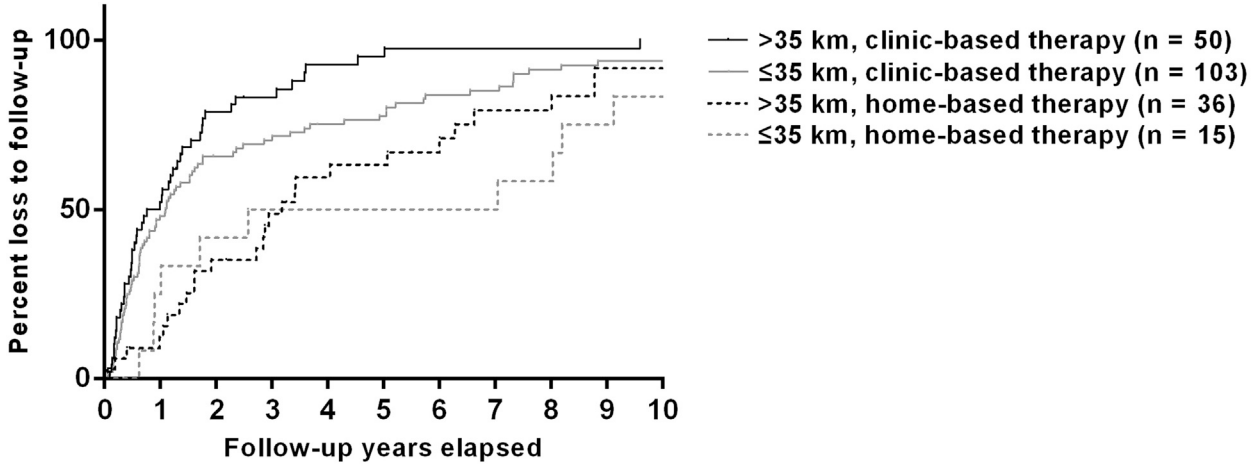

Fig 2. Subgroup Kaplan-Meier analysis. In the clinic-based treatment group, the subgroup of patients who lived >35 km away from the clinic showed increased loss-to-follow-up rates ($P = .025$ in the log-rank test; hazard ratio, 1.504; 95% confidence interval, 1.048-2.158 in the Cox regression analysis). The home-based treatment group showed no increased risk of loss to follow-up even with greater distances ($P = .550$; hazard ratio, 1.243; 95% confidence interval, 0.606-2.549). The relationships among the 4 curves showed significant differences, except those between the curves of the 2 home-based treatment subgroups.

This strategy can be appropriately applied by considering the visiting distances.

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Psoriasis and the risk of migraines in the United States

To the Editor: Psoriasis is a chronic inflammatory skin and systemic disease that affects approximately 3% to 4% of the US population.[1] Migraines are severe, disabling headaches that affect approximately 20% of Americans.[2] Both psoriasis and migraines have been associated with metabolic syndrome, diabetes mellitus, hypertension, and elevated body mass index (BMI).[3] Additionally, an association between these 2 disease entities has been established in several international cohorts.[4,5]

Data from the 2003-2004 National Health and Nutrition Examination Survey were examined. The history of psoriasis was ascertained by a "yes/no" item. Migraines were ascertained based on the "yes/no" response to having severe headaches or migraines in the past 3 months.

The covariates in our study were age, gender, BMI, cigarette smoking, diabetes mellitus, and hypertension. Covariates were self-reported except for BMI, which was obtained from examinations that each participant underwent and was maintained as a continuous variable in analyses.

We used *t* tests to analyze continuous variables and the χ^2 test or Fisher exact test for categorical variables for univariate analyses and logistic regression models for multivariate analyses. Stata statistical analysis software version 15.0 (StataCorp LP, College Station, TX) was used for data analysis. We used the complex survey function for the National Health and Nutrition Examination Survey population data. This function accounts for sample weights applied to the surveyed population and the complex sampling design to draw inferences about the generalized US population. All statistical tests were 2-tailed and the significance level was $P < .05$.

A total of 3131 respondents answered questions about psoriasis and migraines. In our weighted sample, 3.2% of individuals had psoriasis and 29.2% of individuals had migraines. Compared with patients without psoriasis, those with psoriasis did not differ significantly in terms of age, gender, smoking status, presence of diabetes, or presence of high blood pressure, but they did have higher BMIs ($P < .03$) (Table I).

Univariately, psoriasis was not significantly associated with a history of migraines ($P < .24$). Psoriasis was significantly associated with a history of migraines in the multivariable model (odds ratio, 3.97; 95% confidence interval, 1.76-8.95; $P < .003$) (Table II). Male gender was a protective factor and was associated with a 60% lower odds of migraines compared with women (odds ratio, 0.4; 95% confidence interval, 0.29-0.55; $P < .001$) (Table II).

This US cross-sectional study revealed an increased risk of migraines in patients with psoriasis, controlling for age, gender, BMI, hypertension, diabetes, and smoking. In our model, psoriasis was the predictor associated with the greatest magnitude of increased risk of migraines. This corroborates the findings of several international studies.[4,5] Both conditions have been associated with multiple cardiovascular risk factors, all of which involve inflammation as a component of the pathophysiology.[3]

Our study is limited by the cross-sectional survey design and the use of self-reported questionnaires. Furthermore, severe headache and migraine could not be separated. Moreover, our sample size was relatively small.

This cross-sectional US study demonstrates that individuals with psoriasis are at an approximately 4-fold increased risk of migraines. Although further study is needed to better understand this relationship, individuals with psoriasis should be monitored and appropriately treated for migraines.

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