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Long-Term Prognosis of Alopecia Areata in Children and Adolescents

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Dear Editor:

The prognosis of alopecia areata (AA) during childhood may be worse in comparison to cases involving adult patients[1,2]. However, there is no concrete evidence for this assumption because it is based on a small number of studies on Asian subjects with insufficient long-term follow-up data[3,4]. Disease progression in children with AA is also more difficult to predict in comparison to adults. It is possible that prognosis is worse because disease progression in children with mild AA is not necessarily better[2]. When AA progresses to alopecia totalis (AT) or alopecia universalis (AU), long-term prognosis with respect to full recovery is generally reported at a frequency of less than 10%[5]. However, the data for this result is outdated and was reported in the 1950s, thereby making evidence unreliable. Recently, we evaluated the long-term prognosis of patients with AT or AU and found that it is better than previously thought[6]. Long-term outcome evaluation of patients with AA is important. Because AA is associated with frequent recurrence, it is difficult to determine whether complete recovery has occurred when AA progresses to more severe conditions. Our previous study suggests that at least 5 years of follow-up observation is required to predict the long-term prognosis of patients with AA[7].

In this study, we investigated the long-term prognosis (>10 years) of children and adolescents (≤19 years old) with AA. Among 140 patients with pediatric AA from our outpatient database, 75 who were available for follow-up observations for long-term prognosis via their medical records and phone surveys were included. This study was

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approved by the Institutional Review Board of Kyungpook National University Hospital (KNUH 2018-01-001). Overall, a total of 75 patients including 41 males and 34 females were enrolled in the study. The mean age of onset was 8.2 years and the duration of hair loss from the time of onset was an average of 13.5 years. At initial visit, 27 patients had S1 (<25% hair loss), 14 patients had S2 (25%~49% hair loss), 5 patients had S3 (50%~74% hair loss), 9 patients had S4 (75%~99% hair loss), and 20 patients had AT/AU (Table 1). Full hair regrowth was observed in approximately 34.7% of patients, and no hair regrowth or aggravation was observed in approximately 32.0%. In S1 and S2, complete hair regrowth was observed in approximately 50% of patients, and no hair regrowth or aggravation in approximately 20%. Complete hair regrowth was found in 2 patients with AT/AU. Therapeutic modalities for AA depend on patient age[8]. In those younger than 10 years, intralesional corticosteroids and topical immunotherapy are avoided. Those older than 10 years are treated with the same protocols as adults. Therefore, we conducted a subgroup analysis based on the age 10. The results for patients younger than 10 years and patients aged 10~19 years were not significantly different; however, the rates of no hair regrowth or aggravation for S1 and S2 were higher in patients younger than 10 years (Table 2).

We found that patients had less favorable prognosis when the duration of hair loss was longer, and when they had a longer period from disease onset to hospital visit. The presence or absence of atopic disease did not significantly affect prognosis, nor did family history or nail involvement (data not shown). Complete hair regrowth was more frequent when topical agents were used. In particular, complete hair regrowth was less when diphenylcyclopropenone immunotherapy and systemic immunosuppressants were used; however, this was because of the difference in the severity of the condition in patients who participated in the treatment (Table 2).

The natural history of AA is difficult to predict and the prognosis of children may be worse than that of adults[1-4]. It is also known that no treatment can affect the course of AA[9]. Unlike atopic dermatitis or psoriasis, the extent of disease does not always reflect disease activity or progression in AA. AA in a small alopecic area can progress to AT or AU if the activity of alopecic lesions is high[10]. This supports the clinical significance of the long-term outcome of AA, especially in children. However, the long-term prognosis of AA that begin in childhood is uncertain. Tosti et al.[2] reported that long-term follow-up study of 191 patients with AA. They included 39 patients were 14 years of age or younger at presentation. Of 24 children with S2 disease, only 3 recovered completely, while 6 developed AT and 6 AU; the others maintained S1 or S2 disease, with varying severity. They showed that long-term prognosis for childhood AA in general is poorer than in adults. Compared to this study, we found that the rate of no change or aggravation is lower. This is may be due to the relatively large number of S1 patients in our study.

Limitations include the evaluation of hair loss condition via chart review and phone survey, the limited number of subjects included, and selection bias.

In this study, we found that 34.7% of pediatric and adolescent patients with AA had full-hair regrowth, and 32.0% had no hair regrowth or aggravation among the 75 pediatric and adolescent patients with AA. Our results suggest that the severity of the first visit is associated with long-term prognosis. In case of children, if the hair loss area is mild but the activity is high, disease may become worse. Therefore, the extent and disease activity should both be taken into consideration.

Table 1. Demographic and clinical characteristics of children and adolescents with alopecia areata

Characteristic	S1 (n=27)	S2 (n=14)	S3 (n=5)	S4 (n=9)	AT (n=8)	AU (n=12)	Total (n=75)
Sex (patient no.)							
Male	15	8	2	5	4	7	41
Female	12	6	3	4	4	5	34
Age (yr)							
Onset	7.2±4.1	9.6±4.9	5.0±5.2	11.9±4.1	7.9±4.9	7.6±5.3	8.2±4.8
Initial visit	7.7±4.3	10.2±4.8	7.2±5.5	13.6±3.0	10.6±6.1	12.0±5.9	9.9±5.1
Current	18.2±4.5	21.6±5.1	17.9±4.0	25.2±4.5	25.5±5.8	25.9±6.5	21.7±6.0
Duration (yr)							
Onset of alopecia	11.0±3.3	12.0±3.1	12.9±1.7	13.3±3.3	17.6±1.9	18.3±7.0	13.5±4.8
First visit	10.4±2.4	11.4±3.0	10.7±2.4	11.6±3.1	14.9±1.7	13.9±3.1	11.8±3.0

Values are presented as number or mean±standard deviation. S1: <25% hair loss, S2: 25%~49% hair loss, S3: 50%~74% hair loss, S4: 75%~99% hair loss, AT: alopecia totalis, AU: alopecia universalis.

Table 2. Long-term outcomes of patients with AA in children and adolescents (n=75), based on known prognostic factors and main therapeutic modalities

Prognostic factors	No hair regrowth or aggravation	Partial hair regrowth				Complete hair regrowth
		<10%	10%~49%	50%~89%	≥90%	
Clinical type of AA						
S1 (n=27)	5 (18.5)	-	2 (7.4)	3 (11.1)	3 (11.1)	14 (51.9)
S2 (n=14)	3 (21.4)	1 (7.1)	1 (7.1)	-	2 (14.3)	7 (50.0)
S3 (n=5)	1 (20.0)	-	-	-	3 (60.0)	1 (20.0)
S4 (n=9)	4 (44.4)	1 (11.1)	2 (22.2)	-	-	2 (22.2)
AT (n=8)	3 (37.5)	-	2 (25.0)	1 (12.5)	1 (12.5)	1 (12.5)
AU (n=12)	8 (66.7)	1 (8.3)	1 (8.3)	1 (8.3)	-	1 (8.3)
Total (n=75)	24 (32.0)	3 (4.0)	8 (10.7)	5 (6.7)	9 (12.0)	26 (34.7)
Clinical type of AA (patients with onset earlier than 10 years of age)						
S1 (n=21)	4 (19.0)	-	2 (9.5)	3 (14.3)	2 (9.5)	10 (47.6)
S2 (n=7)	2 (28.6)	1 (14.3)	-	-	-	4 (57.1)
S3 (n=4)	1 (25.0)	-	-	-	2 (50.0)	1 (25.0)
S4 (n=2)	-	-	1 (50.0)	-	-	1 (50.0)
AT (n=4)	1 (25.0)	-	2 (50.0)	-	1 (25.0)	-
AU (n=8)	5 (62.5)	1 (12.5)	1 (12.5)	1 (12.5)	-	-
Total (n=46)	13 (28.3)	2 (4.3)	6 (13.0)	4 (8.7)	5 (10.9)	16 (34.8)
Clinical type of AA (patients with onset aged 10~19 years)						
S1 (n=6)	1 (16.7)	-	-	-	1 (16.7)	4 (66.7)
S2 (n=7)	1 (14.3)	-	1 (14.3)	-	2 (28.6)	3 (42.9)
S3 (n=1)	-	-	-	-	1 (100.0)	-
S4 (n=7)	4 (57.1)	1 (14.3)	1 (14.3)	-	-	1 (14.3)
AT (n=4)	2 (50.0)	-	-	1 (25.0)	-	1 (25.0)
AU (n=4)	3 (75.0)	-	-	-	-	1 (25.0)
Total (n=29)	11 (37.9)	1 (3.4)	2 (6.9)	1 (3.4)	4 (13.8)	10 (34.5)
The period from onset of alopecia						
8~12 yr (n=40)	7 (17.5)	1 (2.5)	4 (10.0)	4 (10.0)	6 (15.0)	18 (45.0)
13~17 yr (n=19)	6 (31.6)	-	3 (15.8)	1 (5.3)	2 (10.5)	7 (36.8)
≥18 yr (n=16)	11 (68.8)	2 (12.5)	1 (6.3)	-	1 (6.3)	1 (6.3)
Total (n=75)	24 (32.0)	3 (4.0)	8 (10.7)	5 (6.7)	9 (12.0)	26 (34.7)
Duration of the disease at time of first visit						
<3 mo (n=25)	5 (20.0)	1 (4.0)	2 (8.0)	2 (8.0)	2 (8.0)	13 (52.0)
3~1 mo (n=26)	8 (30.8)	1 (3.8)	5 (19.2)	1 (3.8)	2 (7.7)	9 (34.6)
12~24 mo (n=11)	5 (45.5)	-	-	-	2 (18.2)	4 (36.4)
2~5 yr (n=5)	1 (20.0)	-	-	2 (40.0)	2 (40.0)	-
>5 yr (n=8)	5 (62.5)	1 (12.5)	1 (12.5)	1 (12.5)	-	-
Total (n=75)	24 (32.0)	3 (4.0)	8 (10.7)	5 (6.7)	9 (12.0)	26 (34.7)
Concomitant atopic diseases						
Yes (n=30)	8 (26.7)	1 (3.3)	4 (13.3)	3 (10.0)	4 (13.3)	10 (33.3)
No (n=45)	16 (35.6)	2 (4.4)	4 (8.9)	2 (4.4)	5 (11.1)	16 (35.6)
Total (n=75)	24 (32.0)	3 (4.0)	8 (10.7)	5 (6.7)	9 (12.0)	26 (34.7)
Main therapeutic modalities						
Diphenylcyclopropenone (n=15)	9 (60.0)	-	3 (20.0)	1 (6.7)	1 (6.7)	1 (6.7)
Systemic immunosuppressants (n=5)	2 (40.0)	-	1 (20.0)	-	1 (20.0)	1 (20.0)
Topicals (n=31)	3 (9.7)	1 (3.2)	2 (6.5)	2 (6.5)	4 (12.9)	19 (61.3)
Combined and/or intercurrent (n=16)	8 (50.0)	2 (12.5)	1 (6.3)	1 (6.3)	1 (6.3)	3 (18.8)
Others (n=8)	2 (25.0)	-	1 (12.5)	1 (12.5)	2 (25.0)	2 (25.0)
Total (n=75)	24 (32.0)	3 (4.0)	8 (10.7)	5 (6.7)	9 (12.0)	26 (34.7)

Values are presented as number (%). S1: <25% hair loss, S2: 25%~49% hair loss, S3: 50%~74% hair loss, S4: 75%~99% hair loss, AA: alopecia areata, AT: alopecia totalis, AU: alopecia universalis.

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CONFLICTS OF INTEREST

The authors have nothing to disclose.

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