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Parenting Styles and Psychological Effects on Children with Alopecia Areata: Exploring Family Dynamics, Anxiety, and Depression

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Abstract

Objective

Alopecia areata (AA) is an autoimmune disease that develops due to inflammation and causes sudden hair loss. It has been observed that family circumstances may contribute to the development of AA. This study aims to assess the relationship between the development of alopecia areata in children, family functions, and depression and anxiety levels in their parents.

Methods

Thirty-nine participants diagnosed with AA and 41 healthy controls (HC), aged between 8 and 18 years, and their parents participated in the study. The assessment of the children included the completion of a socio-demographic data form, the Parenting Style Scale (PSS), and the Revised Children's Anxiety and Depression Scale (RCADS). The parents provided information on a sociodemographic form, the Beck Depression Inventory (BDI), and the Beck Anxiety Inventory (BAI).

Results

The children in the control group scored significantly higher on the PSS acceptance/ involvement subscale than those with AA. In the AA group, the number of authoritative and indulgent (PSS) families was statistically significantly lower than that of the families in the HC, and the number of neglectful families was statistically significantly higher than those of the control group. Total anxiety and depression t scores (RCADS) were statistically significantly higher in the AA children than in the HC.

Conclusion

Our study demonstrates the importance of considering familial factors and parental mental health to understand and address alopecia areata in children. Our findings support the psychosomatic component of AA. Implementing comprehensive treatment strategies that target psychological well-being and family dynamics could prove crucial.

1- Introduction

Alopecia areata (AA) is an autoimmune disease that develops due to inflammation and causes sudden hair loss. It is characterized by sudden hair loss without scarring, usually in well-defined areas such as the scalp, beard, and hair [1]. Genetic predisposition, autoimmune processes, and environmental factors contribute to the development of AA[2–4] In addition, chronic or acute psychoemotional stress is suggested to have a potential influence on the development or progression of AA [5].

Previous studies have suggested a link between stressful life events and the occurrence of AA [5]. Lifelong traumatic events have been reported to be more common in AA patients compared to healthy controls, and childhood trauma is also common[6]. Picardi et al. suggested that a person's ability to cope with stress is related to the development of AA, rather than stressful events directly causing AA. They showed that AA is associated with a lack of social support, high levels of avoidance of relationships that require attachment, and alexithymia [7]. Diaz-Atienza and Gurpegui showed that families with AA children have lower expressiveness and they suggested that family circumstances may contribute to the development of AA [8]. Just as family circumstances may contribute to the development of AA, skin disorders may also affect families. Liu et al. showed that the parents of affected children are more affected in their quality of life than the patients themselves [9]. Manzoni et al. showed that higher levels of anxiety and depression were observed in caregivers of patients with different types of dermatoses (vitiligo, atopic dermatitis, and psoriasis) compared to the general population [10].

It has been shown that pediatric and adult patients with AA suffer more frequently from anxiety and depression compared to the general population [11, 12]. This is a bidirectional relationship: AA has a negative impact on the psychological status of patients, and there is also evidence that depression may be a contributing factor to the development of AA [12, 13]. In addition, previous studies have observed that antidepressants not only improved the psychological well-being of depressed patients with AA but also led to hair regrowth [14, 15].

The present study aimed to investigate the influence of familial factors, parental depression, and anxiety levels on the manifestation of clinical features associated with AA in families in which the children were diagnosed with the disease. We hypothesized that impaired family functioning along with elevated levels of parental depression and anxiety would have a detrimental impact on the manifestation of AA in children.

2- Material and methods

2.1. Participants and procedure

The study included patients who were diagnosed with AA, and their parents, who were followed up between January 2021 and June 2021 in the outpatient clinic of the Istanbul University-Cerrahpaşa, Cerrahpaşa Faculty of Medicine, Department of Dermatology and Venereology. The inclusion criteria for the patients were that they 1) had an ongoing follow-up with a confirmed diagnosis of AA, 2) lived with their parents, and 3) fell within the age range of 8 to 18 years. The exclusion criteria were as follows: (1) a psychiatric diagnosis, (2) the presence of a chronic illness, and (3) an intellectual disability. The inclusion criterion for parents was having a child with AA. The exclusion criteria for parents were (1) having an intellectual disability, and (2) being illiterate.

Among the patients, there was no chronic disease, psychiatric diagnosis, or intellectual disability. The analysis included 39 patients. Forty-one healthy children in the same age range who applied to Istanbul

University-Cerrahpaşa, Cerrahpaşa Faculty of Medicine, Department of Skin and Venereology outpatient clinic, and their parents were included.

2.2. Data collection tools

The semi-structured questionnaire on sociodemographic data, the Parenting Style Scale (PSS), and the Revised Children's Anxiety and Depression Scale (RCADS) were completed by all children with AA and healthy controls. A 9-item sociodemographic and clinical data questionnaire was used to assess patients' demographic and disease-related variables, including the AA severity scale (severity of alopecia tool/SALT) score. Healthy controls completed a sociodemographic form that contains 5 items. Parents of patients and healthy controls completed a sociodemographic form that contains 7 items, Beck Depression Inventory (BDI), and Beck Anxiety Inventory (BAI).

The Parenting Style Scale (PSS) was developed in 1991 by Lamborn et al [16]. It comprises three factors: Acceptance/involvement, strictness/supervision, and psychological autonomy. The scale is measured in two ways. First, parents are rated as "authoritative" (3 points), "nonauthoritative" (0 points), and "somewhat authoritative " (2 points) by the respondents' answers to the three dimensions. The second measurement distinguishes between four different parental attitudes: "authoritative", "neglectful", "authoritarian", and "indulgent". Authoritative families are those who scored in the upper tertiles on both acceptance/involvement and strictness/supervision, indulgent families are who scored in the highest tertile on acceptance/involvement but in the lowest tertile on strictness/ supervision, and neglectful families are who scored in the lowest tertiles on both variables[16]. The validity and reliability study of the scale was conducted by Yılmaz in 2000. The Cronbach's alpha value was 0.72 for the acceptance/involvement sub-dimension; 0.75 for the strictness/supervision sub-dimension, and 0.67 for the psychological autonomy sub-dimension [16, 17].

The BDI was developed by Beck et al. and consists of 21 questions, each scored between 0 and 3. High scores indicate an increase in the severity of depressive symptoms. The total score that can be determined with the scale is between 0 and 63. The Turkish validity and reliability study was conducted by Hisli in 1989, and the Cronbach's alpha was 0.74 [18, 19].

The BAI was developed by Beck et al. in 1988. It consists of 21 questions. Each item is scored between 0 and 3 and the total score range is 0–63. The higher the score the more severe the anxiety felt by the person. The Turkish validity and reliability study was conducted by Ulusoy et al., and the Cronbach's alpha was reported to be 0.93 [20, 21].

The RCADS was developed by Chorpita et al. in 2000, and assesses depression and anxiety disorders in children according to the Diagnostic and Statistical Manual of Mental Disorders-4th edition. It is a Likert scale with values between 0 and 3 and consists of 47 items. The child and adolescent fill it out themselves. The validity and reliability study of the scale in Turkey was conducted by Görmez et al., and the Cronbach's alpha value was 0.95 [22, 23].

2.3. Statistical analysis

SPSS v.21 (SPSS Inc., Chicago, IL, USA) was used for statistical analysis. Continuous variables were presented as mean ± sd and median, interquartile range (IQR), and categorical variables as frequency and percentage. Variables were analyzed using visual (histograms, Q-Q plots) and analytical methods (Shapiro-Wilk test/Kolmogorov-Simirnov) to determine whether they were normally distributed or not. Comparisons of groups for continuous variables were performed using the Mann-Whitney U test or the independent sample t-test for two groups, and the Krusskall-Wallis test for more than two groups. The chi-square test or Fisher's Exact test was used to analyze categorical variables. Post-hoc analyses were performed to test significance differences for multiple comparisons. While investigating the associations between non-normally distributed variables, the correlation coefficients and their significance were calculated using the Spearman test. To control for sociodemographic variables, a binomial logistic regression analysis was performed and the data were presented as odds ratio (OR) and 95% confidence interval (95% CI). Variables with a p-value below 0.25 in the univariate analysis were assessed with binomial regression analysis. The enter method was used for the regression analysis. The level of statistical significance was set at $p < 0.05$.

3- Results

Thirty-nine AA patients and 41 healthy controls were included in the study. While the age of AA patients was between 8 and 18 (median (IQR), 12 (10–14); mean, 12.38 years) and the number of girls was 27 (53.9%), the age of HC was between 8 and 17 (median (IQR), 12 (9-14.5); mean, 12.17 years) and the number of girls was 21 (65.9%). There was no statistically significant difference between the control and patient groups in terms of age, gender, mother's age, father's age, and father's employment status (all $p > 0.05$). In the patient group, the proportion of both parents with primary school education or less was significantly higher than in the control group. In comparison, the proportion of both parents with university education or above was significantly lower than the control group ($p < 0.001$ and $p < 0.001$, respectively). The proportion of working mothers in AA group was significantly lower compared to the control group ($p < 0.001$) (Table 1).

Table 1

Sociodemographic characteristics of patients and healthy controls and their parents.

	Healthy controls	**Patients**	**p**
	n = 41	n = 39	
Age *(median(IQR))*	12(9-14.5)	12(10–14)	0.749*
Gender			
Female (n (%))	27 (65.9)	21 (53.8)	0.273**
Age (mother) *(median(IQR))*	40(35–44)	40(35.5–44)	0.619***
Age (father) *(median(IQR))*	44(39.5–49)	44(40.5–47.5)	0.922***
Educational Level (mother)			
Primary school (n (%))	4 (9.8)[a]	21 (53.8)[b]	**< 0.001****
High school (n (%))	16 (39)[a]	10 (25.6)[a]	
University (n (%))	21 (51.2)[a]	8 (20.5)[b]	
Employment Status (mother)			
Employed (n (%))	28 (68.3)	10 (25.6)	**< 0.001****
Educational Level (father)			
Primary school (n (%))	1 (2.4)[a]	11 (28.9)[b]	**< 0.001****
High school (n (%))	19 (46.3)[a]	20 (52.6)[a]	
University (n (%))	21 (51.2)[a]	7 (18.4)[b]	
Employment Status (father)			
Employed (n (%))	39 (95.1)	35 (92.1)	0.667****
Disease-related features			
Age of onset (mean ± SD)	8.37 ±3.26		
Disease duration (mean ± SD)	3.78 ± 2.54		
Number of attacks with active hair loss (n(%))			
1 (n (%))	14 (35.90)		
2 (n (%))	10 (25.64)		
3 and more (n (%))	15 (38.46)		

SALT score (mean ± SD)	66.46 ± 35.39

IQR: Interquartile Range, *Mann-Whitney U test, **Chi-squared test, ***Independent Sample t-test, ****Fisher's Exact test

While the value of the PSS scale acceptance/involvement was significantly higher in the children of the control group than in the children with AA, the other subscales did not differ statistically significantly between AA and HC ($p < 0.001$, $p = 0.375$ and $p = 0.270$, respectively). When controlling for the variables of mother's education, father's education, and mother's employment status, it was found that lower scores on the acceptance/involvement and strictness/supervision were significantly associated with alopecia areata (OR = 0.81 and OR = 0.83, respectively). The total anxiety t scores and total anxiety and depression t scores (RCADS) of the children with AA were statistically significantly higher than in HC. The BAI and BDI scale scores of both mothers and fathers of children diagnosed with alopecia areata were statistically significantly higher than those of HC. When controlling the variables of mother's education, father's education, and mother's employment status, it was found that higher anxiety and depression t score (RCADS), higher BAI and BDI score of parents were significantly associated with alopecia areata (Table 2).

Table 2

Comparison of the patient and control groups with regard to PSS, RCADS, parents' BDI, and BAI scores.

	Healthy Controls	**Patients**	**p***	**Adjusted [a]**	
	n = 41	n = 39		O.R. (%95 C.I.)	p
	Median(IQR)	Median(IQR)			
PSS					
Acceptance/involvement	25(22.5–28)	20.5(17–23)	**< 0.001**	**0.81(0.71–0.92)**	**0,001**
Psychological autonomy	18(16–21)	18(15–21)	0.375**	0.95(0.83–1.09)	0.497
Strictness/supervision	25(23–26)	23.5(20.75-26)	0.27	**0.83(0.71–0.96)**	**0.015**
Total Anxiety t (RCADS)	40(34–55)	61(50.75–68.25)	**< 0.001**	**1.11(1.04–1.17)**	**0.001**
Total Anxiety Depression t (RCADS)	39(33.5–57)	62.5(49-70.25)	**< 0.001**	**1.10(1.05–1.17)**	**< 0.001**
BAI (mother)	7(2.5–13)	14(6–24)	**0.011**	**1.05(1.00-1.10)**	**0.045**
BDI (mother)	6(4–11)	19(10–29)	**< 0.001**	**1.20(1.09–1.34)**	**< 0.001**
BAI (father)	3(0-10.5)	7(2–17)	**0.031**	**1.06 (1.00-1.12)**	**0.040**
BDI (father)	3(0-7.5)	13(6-21.25)	**< 0.001**	**1.33(1.13–1.57)**	**0.001**

IQR: Interquartile Range, *Mann-Whitney U test, **Independent Sample t-test

PSS: Parenting Style Scale, RCADS: Revised Children's Anxiety and Depression Scale, BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory.

[a] Mother's education, father's education, and mother's employment status were included in the logistic regression model.

In the AA group, the number of authoritative and indulgent (PSS) families was statistically significantly higher than in the control group, and the number of neglectful families was statistically significantly higher than in the HC group (Table 3).

Table 3

Comparison of the patient and control groups with regard to parental attitudes.

	Healthy controls	Patients	p*
	n = 41	n = 39	
	n (%)	n (%)	
Parental attitudes (PSS)			
Authoritative	18(43.9)[a]	6(15.8)[b]	**< 0.001**
Authoritarian	6(14.6)[a]	12(31.6)[a]	
Indulgent	13(31.7)[a]	5(13.2)[b]	
Neglectful	4(9.8)[a]	15(39.5)[b]	
*Chi-squared test,			
Each superscript letter denotes significantly different groups at p = 0.05 level. PSS: Parenting Style Scale			

There was no statistically significant association between AA patients' SALT score and their parents' anxiety and depression scores, age of onset, and duration of illness. Furthermore, When the patients were divided into 4 groups according to their parents' attitudes (authoritative, authoritarian, indulgent, neglectful), there was no statistically significant difference in SALT scores between the groups.

When the anxiety and depression scores of the patients and their parents were evaluated according to the number of exacerbation periods with active hair loss, the BDI score of mothers of children with 3 or more exacerbation periods was significantly higher than that of children with 2 attacks. For the other scores, there were no statistically significant differences depending on the number of exacerbation periods (Table 4).

Table 4
Relationship between the number of exacerbation periods with active hair loss and the RCADS, parent's BDI and BAI scores of the parents.

	Number of exacerbation periods with active hair loss			
	1	**2**	**3 and above**	**p***
	n = 14	n = 10	n = 15	
	Median(IQR)	Median(IQR)	Median(IQR)	
Total anxiety t score (RCADS)	64(45.75-73)	60(56.5–65.5)	59(48-69.25)	0.943
Total anxiety-depression t score (RCADS)	66.5(46.5-73.25)	61(58.25–68.5)	62(49-72.25)	0.967
BAI (mother)	16(5-20.75)	8(0–26)	15(10–25)	0.324
BDI (mother)	18(10.75–27.5)[a,b]	8.5(3.75–21.25)[b]	28(13–35)[a]	**0.022**
BAI (father)	7(2.5–15.5)	6(1.5–28)	6.5(2.5-22.25)	0.907
BDI (father)	14.5(7.25–19.5)	19(8.75–25.25)	10.5(3.75–14.25)	0.379

*Kruskall-Wallis test

RCADS: Revised Children's Anxiety and Depression Scale, BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory.

Groups that do not contain the same letter indicate different groups at $p < 0.05$ level.

Maternal BDI scores of children diagnosed with AA who had high levels of depression were significantly higher than those of children with normal levels of depression ($p = 0.006$), (Table 5).

Table 5
Comparison of normal and high anxiety-depression groups (RCADS) in terms of PSS, SALT score, parents' BDI, and BAI scores.

	RCADS - Total anxiety and depression		
	Normal	**High (70 and above)**	**p***
	n = 26	**n = 11**	
	Median (IQR)	Median (IQR)	
Salt Score	64 (25–100)	100 (70–100)	0.142
PSS			
Acceptance/ involvement	20.5(16.75-23,25)	21(18–23)	0.566
Psychological autonomy	18(15–21)	17(14–19)	0.3
Strictness/ supervision	23(20.5–26)	26(20–26)	0.523
BAI (mother)	10(5–23)	20(15–33)	**0.006**
BDI (mother)	16(7–27)	23(13–31)	0.132
BAI (father)	4.5(2–15,5)	13(4-31.25)	0.145
BDI (father)	11(5.5–17)	18(6–30)	0.06

*Mann-Whitney U test

RCADS: Revised Children's Anxiety and Depression Scale, PSS: Parenting Style Scale, BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory.

4- Discussion

The present study aimed to investigate the influence of family functioning, parental depression, and anxiety levels on the manifestation of clinical features associated with AA in families where children were diagnosed with the disorder. We found that some family attitudes and parental anxiety and depression were associated with AA. Children's anxiety and depression were also associated with AA.

Previous studies suggested that certain characteristics of family functioning may play a role in the development of AA. Diaz-Atienza and Gurpegui suggested that growing up in a family where one is not allowed to express one's feelings directly confers an increased risk for the development of AA and they concluded that patients diagnosed with AA have defective family functions [8]. Saraswat et al. suggested that the impact of a stressful personal or family life, parental pressure to perform better in school, and psychological vulnerability may contribute significantly to the onset or exacerbation of AA[24]. Picardi et al. found that a lack of social support, and high levels of avoidant behavior in attachment relationships that are closely related to family structure are associated with AA [7]. In our study, it was found that the

families of children diagnosed with AA showed lower acceptance/involvement than HC. In addition, the number of families in the authoritative group and the indulgent group of AA patients was lower than that of HC, and the number of families in the neglectful group was higher than that of HC. The acceptance/involvement dimension indicates higher levels of compassion and interest. Our results can be inferred that accepting family attitudes facilitates expressiveness, so less AA may be developed in families with this attitude. While the strictness/supervision dimension is lower in AA patients, the number of families in the indulgent group was lower. This result can be interpreted as strictness/ supervision will facilitate the development of AA in the case of a lack of acceptance/ involvement.

This study found that both mothers and fathers of children diagnosed with AA had higher anxiety and depression scores than those of HC. Mothers of children with 3 or more exacerbation periods had higher scores for depression. In addition, among AA patients, the depression scores of mothers of children with high total anxiety depression scores were higher than those of children with normal total anxiety depression scores. Anxiety and depression scores have been studied in many skin diseases. It has been observed that depressive symptoms are higher in the parents of children with vitiligo than in parents of HC [25]. In another study examining depression and anxiety symptoms in the caregivers of patients with different types of dermatoses (vitiligo, atopic dermatitis, and psoriasis), higher levels of anxiety and depression were found compared to the general population [10]. The results of this study suggest that AA may have influenced the higher rates of anxiety and depression in caregivers [7, 24]. It can also be said that AA has a negative psychological impact on parents of children with AA.

The high rates of anxiety and depression observed in children with AA in our study can be interpreted as a consequence of the disease. Higher rates of anxiety and depression have been demonstrated in pediatric and adult patients with AA[11, 12, 26]. Chu et. al. demonstrated that there is an increased risk of depression in patients under 20 years old[27]. Nevertheless, depression or certain psychological factors have been shown to play a role in the development of AA[13, 28]. In addition, some researchers have shown that patients with depression who are treated with antidepressants have a lower risk of developing AA than patients who do not take antidepressants[29]. These support the role of depression in the development of AA.

Several limitations should be considered when interpreting the results of the study. First, the cross-sectional design of our study provides a snapshot of the current status of patients and their families, but it cannot determine the direction of relationships between variables. Second, self-report measures that we used to assess family attitudes, parental depression, anxiety, and other variables may introduce biases, such as social desirability or recall bias. Third, potential confounding variables such as genetic predispositions, and other medical conditions were not examined. Future studies that have a longitudinal design, incorporating multiple assessment methods, such as clinical interviews or observational measures may provide a better understanding of the relationship between family dynamics, parental psychological status, and AA.

5- Conclusion

Family dynamics and the psychological status of parents may play a role in the development or exacerbation of AA in children. These findings highlight the importance of the family environment in understanding and managing AA. Our findings underscore the importance of considering parental psychological well-being in the context of pediatric AA, potentially indicating a need for additional support or intervention for affected families. These conclusions suggest that interventions to improve family dynamics, reduce parental depression and anxiety, and support families affected by AA may be beneficial. The study highlights the need for further research to better understand the complex interplay between family dynamics, parental mental health, and the development or manifestation of AA in children. Longitudinal studies could help to clarify the direction of causality and identify possible mechanisms underlying these relationships.

Declarations

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Declaration of competing interest

The authors have no competing interests.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards

This study was approved by the Cerrahpaşa Medical Faculty ethics committee on 21 January 2021 (approval number: 19224). Attention was paid to the principle of voluntary participation in the study.

Author Contribution

Özge Selçukoğlu Kilimci: Conceptualization, methodology, writing– original draft. Sera Nur Yücesoy: Conceptualization, data collection. Şenol Turan: Conceptualization, methodology, writing– review and editing. Beril Kara Esen: Methodology and statistical analysis. Tuğba Kevser Uzunçakmak: Data collection . Nihal Serdengeçti: Conceptualization, data collection. Mahmut Cem Tarakçıoğlu: Conceptualization, methodology. Server Serdaroğlu: Conceptualization, data collection.

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