

## Clinicoepidemiological profile, precipitating factors and severity indicators in alopecia areata in Manipur

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### Abstract

**Introduction:** Alopecia areata (AA) is common cause of non-cicatricial alopecia, characterised by single or multiple patches of hair loss affecting scalp and body hair. It is an autoimmune disorder with an unpredictable course and has profound psychosocial impact on the patients.

**Objective:** To study the clinicoepidemiological profile, precipitating factors and factors influencing the severity of alopecia areata.

**Methods and selection criteria:** A cross-sectional study was carried out in Dermatology Outpatient Department in a tertiary care hospital from October 2011 to September 2013. All new cases of alopecia areata, aged between 1 and 60 years who presented to the Dermatology OPD and fulfilled the inclusion and exclusion criteria were included. A detailed history was taken and clinical examination conducted and recorded. Descriptive statistics and Chi-Square Test were used. Analyses of these data were done by SPSS software, version 16.0.

**Results:** Majority of the patients belonged to the age group of 21 to 30 years. Psychological stress was the most common precipitating factor with 33 (22.75%). Severity wise, moderate AA constituted 84 (57.9%) patients, mild cases constituted 49 (33.8%) patients, 9 (6.2%) patients presented with ophiasis and severe AA which comprises of alopecia totalis and universalis was found in 3 (2.1%) patients.

**Conclusion:** We found that psychological stress plays a major role in precipitating AA and influences its severity. Atopic individuals are more likely to develop AA, specifically the ophiasis type. Ophiasis was more often associated with atopy. Other autoimmune diseases like diabetes mellitus and vitiligo are the common associations

**Keywords:** Alopecia areata, Atopy, Patchy hair loss, Autoimmune, Precipitating factors.

### Introduction

Alopecia areata, 1<sup>st</sup> described by Celsus (14-37A.D)<sup>1</sup> is a common cause of non-cicatricial, patchy hair loss. Alopecia areata has an incidence of 2-3% among the dermatoses and 0.1% in the population at large.<sup>2</sup> It occurs in both sexes and at all ages. It may occur as a single self-limiting episode or may recur at varying intervals over many years. Strong direct and indirect evidence supports an autoimmune etiology for alopecia areata.<sup>3</sup>

Patients usually report abrupt hair loss and marked hair shedding. Its morphology is described as a discoid patch of alopecia which shows no scaling or inflammation. The patch may have a mild peachy hue. Presence of 'exclamation mark hair' at the periphery of the lesion is pathognomonic. The lesions can occur on the scalp, moustache and beard area, eyelashes and eyebrows.

According to extent of involvement, the following forms may be seen: alopecia areata - partial loss of scalp hair; alopecia totalis (AT) - 100% loss of scalp hair; and alopecia universalis (AU) - 100% loss of hair on the scalp and body.

Nail dystrophy may be associated with AA with an incidence of 10% to 66%.<sup>4</sup> The other nail changes include pitting, tachonychia and Beau's lines.<sup>5</sup>

It is seen that stress aggravates many cutaneous diseases in 40-100% of the patients<sup>6</sup> including alopecia areata. Onset of alopecia areata is a common feature after

severe psychological stress.

Alopecia areata frequently occurs in association with other autoimmune disorders such as vitiligo, lichen planus, morphea. There have been some studies with opposing conclusions relating alopecia areata and decreased ferritin levels.

The course of this disease is unpredictable. Prognosis is poor in child with atopy and Mongols. Other poor prognostic factors being alopecia totalis, alopecia universalis, >50% scalp involvement, spherical or reticular pattern, bilateral loss of eyelids or eyelashes, ophiasis and severe nail changes.

Therapeutic options for AA depend on extent of scalp involvement and age of the patient. Treatment modalities include topical agents like topical minoxidil, intralesional corticosteroids, immunosuppressants, contact sensitizers, irritants, photo chemotherapy, cryotherapy and laser therapy. Systemic agents include immunosuppressants, immunomodulators, and photo chemotherapy. Other modalities of treatment include psychotherapy, supportive therapy like tattooing and hair wigs. Recombinant human bone morphogenetic protein and intralesional candida antigen are in the experimental stages.

Many conflicting reports have emerged from various studies regarding the precipitating factors of alopecia areata. Thus the present study was carried out to find the clinicoepidemiological profile, precipitating factors and

the factors influencing its severity.

### Aims and objectives

1. To study the clinicoepidemiological profile of alopecia areata
2. To study the precipitating factors of alopecia areata
3. To find out the factors influencing the severity of alopecia areata.

### Materials and Methods

A cross-sectional study was carried out in the Outpatient Department (OPD) of Dermatology, Venereology and Leprology in a tertiary care hospital from October 2011 to September 2013. All new cases of alopecia areata, both males and females aged between 1 and 60 years who presented to the Dermatology OPD were included in the study. Patients with other causes of patchy hair loss such as androgenetic alopecia, telogen effluvium, tinea capitis, cicatricial alopecia were excluded. Patients with recurrent AA and those on treatment were excluded. Infants and patients > 60 years were excluded from the study. A written, informed consent was taken from the patients who participated in the study. If the patient was a minor, an informed consent was taken from the parents.

A detailed history was taken including onset, duration, progression of the alopecia patches. History of stressful events 1 year prior to onset such as febrile illnesses, infections, major or minor surgeries, physical trauma or stress, psychological trauma or stress, previous and ongoing medications were taken. Personal history and

family history of atopy (including history of bronchial asthma, allergic rhinitis, atopic dermatitis) were taken and a thorough local examination and systemic examination was carried out as per proforma.

Patients were classified based on severity and age of onset. The severity of disease was defined as:<sup>7</sup>

- i. Mild:** Three or less patches of alopecia with a widest diameter of 3 cm or less or the disease limited to the eyelashes or eyebrows.
- ii. Moderate:** Existence of more than 3 patches of alopecia or a patch greater than 3 cm at the widest diameter without alopecia totalis (AT) or alopecia universalis (AU).
- iii. Severe:** AT or AU
- iv. Ophiasis:** Snake-shaped plaques extending to the scalp border or loss of hair in the shape of a wave at the circumference of the head.

Data so collected was checked for consistency and completeness. Summarization and analysis was carried out using descriptive statistics and Chi-Square Test. Analyses of these data were done by SPSS software, version 16.0. Descriptive statistics (mean, percentages and frequency distribution) were used to evaluate the results. Ethical Committee of the hospital was taken.

### Results and Observations

Out of 145 cases of alopecia areata, 58.6% were males and 41.40% were females with a male-female ratio of 1.41:1

**Table 1: Age and sex wise distribution of AA patients**

Age groups (years)	Male	Female	Total (%)
1 – 10	06	05	11 (7.58%)
11 – 20	15	14	29 (20%)
21 – 30	24	20	44 (30.34%)
31 – 40	22	14	36 (24.82%)
41 – 50	16	05	21 (14.48%)
51 – 60	02	02	04 (2.75%)
Total	85 (58.62%)	60 (41.38)	145 (100%)

Table 1 shows age and sex wise distribution of AA patients. Majority of the patients belonged to the age group of 21 to 30 years, comprising 30.34% with 24 (54.54%) males and 20 (45.46%) females. Mean age was 28.1 years with a standard deviation of  $\pm 12.05$ .

Among the patients, students and housewives constituted the majority with 29.66% and 20% respectively. This was followed by Army personnel with 19.32%, Government employees 9.6%, businessmen 3.44% and the others comprised of 17.94%.

**Table 2: Precipitating factors in patients with alopecia areata**

Precipitating factors	Male		Female		Total	
	N	%	N	%	N	%
Psychological stress	23	69.7	10	30.3	33	22.75
Enteric fever	4	80	1	20	5	3.44
Surgery	4	80	1	20	5	3.44
Parasitic infestation	1	100	0	0	1	0.68
Burns	0	0	1	100	1	0.68
Intestinal tuberculosis, Malena	1	100	0	0	1	0.68

Generalised anxiety disorder	1	100	0	0	1	0.68
Febrile illness – Malaria	1	100	0	0	1	0.68
Jaundice	0	0	1	100	1	0.68
No precipitating factors	50	52	46	48	96	66.2

Table 2 shows that psychological stress was the most common precipitating factor with 33 (22.75%) patients out of 145 reporting some form of psychological stress prior to onset of AA. Males outnumbered females in terms of psychological stress being a precipitating factor. This was followed by a recent history of surgery and recent history of enteric fever with 5 (3.44%) patients each.

In our study it was seen that scalp was the most commonly involved site comprising 83.44% patients. This was followed by patients having alopecic patches on scalp and other body areas like face comprising 6.9% of them. 3.45% patients had only beard area involvement, 3.45% had only their eyebrows involved,

only moustache area was involved in 1.38%, patients having both moustache and beard area involvement comprised 1.38%.

In patients with AA with only scalp involvement, the alopecia patches were predominantly present over the parietal and occipital areas constituting 35.17% and 29.65% respectively. This was followed by vertex, frontal area, temporal areas.

Multiple patches were seen in 95 patients (65.52%) and single patch presentation was seen in 50 patients (34.48%). Multiple patches were found more in males, 62 (65.2%) than in females, 33 (34.8%). Single patch presentation was found to be more common in females 27 (54%) than in males 23 (46%).

**Table 3: Distribution of patients based on the types of AA**

Types of AA	Male		Female		Total	
	N	%	N	%	N	%
Patchy AA	77	57.8	56	42.2	133	91.7
Alopecia totalis	2	100	0	0	02	1.4
Alopecia universalis	1	100	0	0	01	0.7
Ophiasis	5	55.6	4	44.4	09	6.2
Total	85	58.6	60	41.4	145	100

Table 3 shows that majority of the patients presented with patchy AA with 133 (91.7%) patients with 77 (57.8%) males and 56 (42.2%) females. 2 (1.4%) cases of alopecia totalis and 1 (0.7%) case of alopecia universalis (Fig. 1) was found. AT and AU were found only in males. 9 (6.2%) patients presented with ophiasis comprising 5 (55.6%) males and 4 (44.4%) females.

**Table 4: Distribution of patients based on severity of AA**

Severity of AA	Male	Female	Total
Mild	33	16	49 (33.8%)
Moderate	44	40	84 (57.9%)
Severe	03	00	03 (2.06%)
Ophiasis	05	04	09 (6.20%)
Total	85	60	145 (100%)

Table 4 shows that majority of the patients had moderate AA with 84 (57.9%) patients including 44 (52.3%) males and 40 (47.7%) females. This was followed by mild cases constituting 49 (33.8%) of which 33 (67.3%) were males and 16 (32.7%) were females. 9 (6.2%) patients presented with ophiasis comprising 5 (55.6%) males and 4 (44.4%) females. Severe AA which comprises of alopecia totalis and universalis was found only in 3 (2.1%) patients and all of them were males (Fig. 1, 2 and 3).

**Table 5: Association between severity of AA and gender**

Severity of AA	Males	Females	Total
	N (%)	N (%)	N (%)
Mild AA	28 (57.1)	21 (42.9)	49 (100)
Moderate AA	49 (58.3)	35 (41.7)	84 (100)
Ophiasis	05 (55.6)	04 (44.4)	09 (100)
Total	82 (57.7)	60 (42.3)	142 (100)

Note: Severe cases (n=3) were excluded from analysis.

Table 5 shows that there is no significant difference between males and females in terms of severity of AA (p value = 0.982).

**Table 6: Association between presence of psychological stress and severity of AA**

Severity of AA	Psychological Stress		Total N (%)
	Yes N (%)	No N (%)	
Mild AA	12 (24.5)	37 (75.5)	49 (100)
Moderate AA	28 (33.3)	56 (66.7)	84 (100)
Ophiasis	2 (22.2)	7 (77.8)	9 (100)
Total	42 (29.6%)	100 (70.4%)	142 (100)

□ Severe cases (n=3) were excluded from analysis.

From table 6 we find that moderate AA was more often precipitated by psychological stress compared to mild AA and ophiasis types but the value was not statistically significant (p value = 0.494).

**Table 7: Association between presence of atopy and severity of AA**

Severity of AA	Atopy		Total N (%)
	Yes N (%)	No N (%)	
Mild AA	16 (32.7)	33 (67.3)	49 (100)
Moderate AA	28 (33.3)	56 (66.7)	84 (100)
Ophiasis	5 (56.6)	4 (44.4)	9 (100)
Total	49 (34.5%)	93 (65.5%)	142 (100)

From table 7 we find that ophiasis was more often associated with atopy. But the association was not statistically significant. Also there was no statistically significant association between presence of atopy and severity of AA (p value = 0.409).



**Fig. 1: Photographs showing an adolescent boy with alopecia universalis**



**Fig. 2: Photograph showing a young boy with ophiasis type of alopecia areata**



**Fig. 3: Photographs showing a child with multiple patches of hair loss**

## Discussion

### Epidemiology

- Sex:** Out of 145 patients studied, majority of the cases of AA were seen in males (58.6%) followed by females (41.4%) with a male- female ratio of 1.41:1. This finding was similar to Akhyani M et al<sup>8</sup> who studied 239 patients with AA including 141 (59%) males and 98 (41%) females (male: female ratio = 1.43:1) and Wani AA et al<sup>9</sup> who studied 50 patients out of which, 32 (64%) were male and 18 (36%) were female. Some studies have reported greater proportion of female patients. Ahmed I et al<sup>10</sup> studied 114 patients, of which 54 (47%) were males and 60 (53%) were females.
- Age group:** In our study, majority of the patients belonged to the age group of 21 to 30 years (3<sup>rd</sup> decade) comprising 30.34% with 24 males and 20 females. This was followed by 4<sup>th</sup> decade (24.82%). Mean age was 28.1 years with a standard deviation of 12.05. Wani AA et al<sup>9</sup> also reported a mean age of 25.4 years. Akhyani M et al<sup>8</sup> reported

a mean age of 21.51 years.

3. **Religion:** Religion-wise, Hindus constituted the majority with 66.9%, followed by Muslims with 17.24% and Christians constituting 15.86%. This may be because, majority of population of this region (Manipur) are Hindus, followed by Christians and Muslims.
4. **Occupation:** Students and homemakers (housewives) constituted the majority with 29.66% and 20% respectively. This was followed by Army personnel with 19.32% and the remaining constituted by teachers, Government employees, businessmen and others. Students constituted the majority, the reason probably being that students are prone to a lot of psychological stress due to pressure from parents to perform well academically and due to peer pressure. Psychological stress being an important precipitating factor for AA (as discussed later), explains the increased number of cases among students. Several army and paramilitary personnel are posted in Manipur due to the law and order situation prevalent here. These are personnel belonging to different parts of the country, who leave their family and live in adverse conditions with frequent migration from place to place, thus having to adapt every now and then to different situations. This puts them under a lot of physical and mental stress. These stressful episodes precipitate AA in them. Also, a majority of them reported onset of AA within a few months of transfer in their postings. Thus they contributed to a significantly proportion of cases (19%).

#### Precipitating factors

1. **Psychological stress:** Psychological stress was the most common precipitating factor with 33 (22.75%) patients out of 145 reporting some form of psychological stress prior to onset of AA. Several reports support our findings with psychological stress being a major precipitating factor for AA. Seyhan M et al<sup>11</sup> reported that among the skin patients having psychopathological problems, 11.3% had AA. Poot F et al<sup>12</sup> reported that family psychopathological diseases and dysfunction may play an important role in the onset or exacerbation of alopecia areata in 25.4% of cases. Chu et al<sup>8</sup> found that patients with AA tend to have coexisting anxiety and comorbid schizophrenia with 50% of psychiatric disorders occurring earlier than AA.
2. **Other precipitating factors:** The other important factors which were found to precipitate AA in our patients were a recent history of surgery and recent history of enteric fever with 5 (3.44%) patients each. This could be explained by the fact that these illnesses cause significant morbidity both physically and mentally. Some of them may have to refrain from their work leading to loss of pay.

All these add to their stress which in turn may precipitate AA.

Some studies have not found any significant correlation between stress and onset of AA. Picardi A et al<sup>13</sup> found that the total number of recent life events (last 12 months) was not different between alopecia patients and the comparison subjects. Basterzi A<sup>14</sup> found no evidence that stressful major life events, depression, anxiety have a role in the etiopathogenesis of AA.

#### Clinical correlates and associations

1. **Atopy:** Atopy was the most common associated condition with AA with 50 (34.5%) patients having history of atopy or clinical findings consistent with atopy. Out of these, allergic rhinitis was found in 36 patients, eczema in 7 (4.8%) patients, bronchial asthma in 2 patients, family history of atopy in 1 patient, pityriasis alba in 2 patients, and hyperlinearity of palms in 2 patients. Thomas EA et al<sup>7</sup> found that atopic dermatitis was 2-3 times more common in patients with alopecia areata. Kaur S et al<sup>15</sup> found that there was a trend towards increasing frequency of severe alopecia as evidence of atopy became stronger, but the results did not attain statistical significance. Nevertheless their study does indicate that atopy was present in 50% of the cases thus correlating with our study. Sharma VK et al<sup>16</sup> found evidence of atopy in a total of 18% patients with AA. Jain S et al<sup>17</sup> found that atopic manifestations were associated in 11.37% patients. Wani AA et al<sup>9</sup> reported that atopy was positive in 16% of the patients. Tan E et al<sup>18</sup> found personal and family history of atopy in 60.7%, but there was no significant association between personal history of atopy and extent of AA. Esfandiarpour I et al<sup>19</sup> reported atopic diathesis in 50%. Akhyani M et al<sup>8</sup> found that personal history of atopy was present in 23 (9.6%).
2. **Nail changes:** Our study found nail changes in 13 patients (9%). Pitting was seen in 5 (3.44%) patients, 2 (1.37%) had melanonychia, 1 (0.68%) patient had beau's lines, 1 (0.68%) had platynychia, 3 (2.06%) had horizontal ridging, 1 (0.68%) had clubbing. Our findings were similar to that of Jain S et al<sup>17</sup> who found nail involvement in (13.34%) patients. Thomas EA et al<sup>7</sup> reported nail involvement in 16.8%, including pitting in 7.2%, longitudinal ridging in 4.2%, brownish discolouration in 2.8%, onycholysis in 1.4%, leuconychia in 1.4%.
3. **Vitiligo:** In our study vitiligo was seen in 2.09% patients. The reason for vitiligo to be associated with AA is probably because both are autoimmune diseases and therefore can occur together as indicated in several other studies. Sharma VK et al<sup>16</sup> reported vitiligo in 1.8% patients which is in concordance with our study. Kuchabal DS et al<sup>20</sup>

reported a case of AA associated with localized vitiligo. Ahmed I et al<sup>21</sup> reported vitiligo in 3.5% of AA patients.

- 4. Diabetes mellitus (DM):** In our study diabetes mellitus was seen in 1.39% patients. This finding was in concordance with Tan E et al<sup>18</sup> who reported DM in 3.2%, Ahmed I et al<sup>10</sup> who found DM in 0.9%. Other studies<sup>22, 23, 24</sup> have also reported DM to be associated with AA. Being autoimmune diseases, diabetes mellitus and AA can occur together, as seen in our study and several other studies.

#### Sites of involvement

In our study, scalp was the most commonly involved site with 83.44% patients. This was followed by patients having alopecic patches on scalp and other body areas. Wani AA et al<sup>9</sup> found involvement of scalp in 70% patients, face in 12%, scalp and face in 9 18%.

3.45% patients had only beard area involved, 3.45% had only their eyebrow area involved. Only moustache area was involved in 1.38%. Patients having both moustache and beard area involvement comprised 1.38%.

Wani AA et al<sup>9</sup> reported similar distribution pattern. They found scalp to be the most common site of involvement with 70% patients. Face was involved in 12% patients, scalp and face in 18% patients. Jain S et al<sup>17</sup> found scalp was the commonest (72.67%) site of AA and in 12.67%; the patches were on areas other than scalp. In 14.66% the site was combined i.e. scalp and other areas. Beard and moustache areas comprised 11.5% and 6.75% respectively.

- 1. Areas of scalp involved:** In our study the alopecic patches over the scalp were predominantly present over the parietal and occipital areas constituting 35.17% and 29.65% respectively. This was followed by vertex, frontal area, temporal area and margins of the scalp. Jain S et al<sup>17</sup> found that on the scalp, commonest site was parietal area followed by occipital area.
- 2. Number of alopecic patches:** Majority of the patients in our study presented with multiple patches (65.52%) as compared to 34.48% patients with single patch AA. Multiple patches were found more in males 62 (65.2%) than in females 33 (34.8%). Single patch presentation was found to be more common in females 27 (54%) than in males 23 (46%). This finding was in concordance with Jain S et al<sup>17</sup> who found multiple patches in 64.66% and single patch in 35.34%.

#### Types of alopecia areata

In our study majority of the patients presented with patchy AA with 133 (91.7%) patients with 77 (57.8%) males and 56 (42.2%) females. 2 (1.4%) cases of alopecia totalis and 1 (0.7%) case of alopecia

universalis was found. AT and AU were found only in males. Ophiasis was found in 9 (6.2%) patients comprising 5 (55.6%) males and 4 (44.4%) females.

- 1. Severity of AA:** Our study revealed that that majority of the patients had moderate AA with 84 (57.9%) with 44 (52.3%) males and 40 (47.7%) females. This was followed by mild cases constituting 49 (33.8%) of which 33 (67.3%) were males and 16 (32.7%) were females. Ophiasis was found in 9 (6.2%) patients including 5 (55.6%) males and 4 (44.4%) females. Severe AA which comprises of alopecia totalis and universalis was found only in 3 (2.1%) patients and all of them were males. Our finding was in contrast to that of Thomas EA et al<sup>7</sup> found that majority of the patients had mild AA with 53.52%, followed by moderate AA in 30.98%, ophiasis in 5.63%, AT in 5.63% and AU in 4.23%. Ahmed I et al<sup>10</sup> found that mild alopecia areata (41%,  $p < 0.05$ ) was the most common presentation followed by moderate disease (31%,  $p < 0.05$ ), severe alopecia (17%,  $p < 0.05$ ), alopecia totalis (7%,  $p < 0.05$ ), alopecia universalis (2.7%,  $p=0.05$ ) and ophiasis (1.7%,  $p=0.05$ ).
- 2. Gender differences in terms of severity of AA:** On comparing males and females with AA, we found no statistically significant differences between them in terms of severity of AA ( $p$  value = 0.982). Our finding was in concordance with that of Akhyani M et al.<sup>8</sup>

#### Impact of psychological stress on the severity of AA

Since we found that psychological stress was the most common precipitating factor in AA, we tried to find whether the presence of psychological stress as a precipitating factor had an influence on the severity of AA. On analysis we found that moderate cases of AA were more often precipitated by psychological stress than the milder cases of AA. However the value was not statistically significant ( $p$  value = 0.494).

#### Association between atopy and severity of AA

Atopic diathesis was the most common association of AA, found in our study. We tried to find out if the presence of atopy in AA patients influenced the severity of AA. Although statistically not significant, we found that ophiasis was more often associated with atopy. Mild and moderate AA cases also did not show a statistically significant association with presence of atopy ( $p$  value = 0.409).

Our results were in concordance with that of Ucak H et al<sup>25</sup> who found that ophiasis pattern occurred more frequently in patients with atopy ( $P < 0.05$ ).

#### Conclusion

Alopecia areata was very common among army personnel in Manipur who work under stressful conditions, indicating that stress plays a major role in

precipitating the condition. Moderate AA being more common in patients with psychological stress and ophiasis being associated with atopy indicate that psychological stress and atopy are some of the factors that influence its severity. Other autoimmune diseases like diabetes mellitus and vitiligo are the common associations. Avoidance and proper management of psychosocial stress may possibly reduce the occurrence of alopecia areata and also reduce its severity in genetically predisposed individuals.

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