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The Trichogram as a Prognostic Tool in Alopecia Areata

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The value of the trichogram as a prognostic tool in alopecia areata was investigated in 93 patients with not more than three lesions on the scalp. Evaluation of the clinical features was one year later. In each patient, two regions were investigated: the margin of one of the lesions and the control region. In 80% of the patients with a normal trichogram at the margin of the lesional hair at the first visit, hair growth was restored one year later, whereas in those with an abnormal trichogram, hair growth was restored in 62.5%. In 11.5% of the patients an alopecia totalis or universalis developed. At the margin of the lesion, no significant association was observed between the trichogram and the clinical features. In the control region, however, the prognosis was much better ($p < 0.001$) in patients with a normal trichogram than in those with an abnormal trichogram. Out of the 62 patients with a normal trichogram, hair growth was restored in 53 (85%), whereas out of the 31 patients with an abnormal trichogram hair growth was restored in only 6 (19%). These findings indicate that a normal trichogram in the control region is a valuable prognostic tool in alopecia areata.

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Alopecia areata (AA) is a trichopathy with an uncertain prognosis, which can occur at any age and shows no male or female predominance. Initial hair loss usually occurs in patches, and in 5–10% of cases leads to AA totalis, with loss of all scalp hair, or AA universalis, with loss of all body hair. In 30% of the cases hair growth is restored within 6 months, in 50% of the cases within a year, and in 70–80% of the cases within 5 years. In 20–30% of the cases there is incomplete recovery, but new bald patches appear at other places while the old lesions disappear spontaneously (1).

The literature shows that factors which influence the restoration of hair growth unfavourably include onset at an early age, familial occurrence, an atopic constitution, concomitant vitiligo, thyroid diseases and other autoimmune diseases (2).

Clinically the ophiasis type of AA and the involvement of other normally hairy parts of the body and/or nails indicate a poor prognosis (3).

When the first bald patches appear, it is virtually impossible to establish a prognosis. An improved prognosis of AA is therefore desirable, especially because this trichopathy entails considerable psychological stress for the patient. In a pilot study it was shown that the trichogram of a control area of the scalp at an early stage can be a prognostic tool in AA (4). In the present study trichograms were evaluated at an early stage of AA in a homogeneous group of patients aged 16–50 years, in an attempt to improve the prediction of hair growth restoration.

PATIENTS AND METHODS

Out of a group of 225 patients (112 males and 113 females) seen at the dermatological outpatient clinic of the University Hospital Rotterdam-Dijkzigt and the outpatient clinic of the Foundation for Hair and Nail Diseases, 93 patients who at the first visit showed not more than three AA lesions on the scalp were selected. The reasons for exclusion were AA of the left temporal (control) region of the scalp, the presence of other diseases in the past or at the time of examination, pregnancy, continued medication or the use of aggressive cosmetic agents. The distribution of age in the selected patients is shown in Table I.

At the first visit, a trichogram was obtained by a standardized method from the margin of one of the lesions (M-region) and from the left temporal (control) region (C-region). The limits of normal values in adults (4) are as follows:

anagen: 66–96%
catagen: 0–6%
telogen: 2–18%
dysplastic/dystrophic pattern: 0–18%.

The abnormal trichograms were divided into a
telogen effluvium ≥ 18% telogens;
mixed effluvium ≥ 18% telogens and ≥ 18% dysplastic and dystrophic forms
dysplastic/dystrophic pattern ≥ 18% dysplastic and dystrophic forms.

One year later, the clinical features of the 93 patients selected were classified into the following categories:

1 – no more lesions (restored).
2 – still new lesions, while hair growth was partially restored or remained unchanged (variable).
3 – progression to AA totalis or AA universalis.

Statistical analysis

In the statistical tests, the results of the trichogram were dichotomized as normal and abnormal for both regions. For testing whether there was a significant association between the clinical features (categorical score) and the dichotomized trichogram result, an exact trend test was used for the M-region, as shown in Table II, and for the C-region, as shown in Table III.

Table I. *Age and clinical features after 1 year*

Age	Number of patients	No more lesions	Variable course	Progression to AA totalis or AA universalis
16–20	21	12 (57%)	4 (19%)	5 (24%)
20–30	36	25 (69%)	8 (22%)	3 (8%)
30–40	23	15 (65%)	7 (30%)	1 (4%)
40–50	13	8 (62%)	5 (39%)	0 (0%)

Table II. *Trichogram from the margin of the lesion (M-region) at the first visit and the clinical features 1 year later*

Clinical features one year later	Trichogram at the first visit		
	Normal	Abnormal	Total
Restored	4 (80%)	55 (63%)	59
Variable course	1 (20%)	24 (27%)	25
Progression to AA totalis or AA universalis	0 (0%)	9 (10%)	9
	5	88	93

Table III. *Trichogram from the left temporal region (C-region) of the scalp at the first visit and the clinical features 1 year later*

Clinical features one year later	Trichogram at the first visit		
	Normal	Abnormal	Total
Restored	53 (85%)	6 (19%)	59
Variable course	8 (13%)	17 (55%)	25
Progression to AA totalis or AA universalis	1 (2%)	8 (26%)	9
	62	31	93

RESULTS

The results are shown in Tables I, II and III.

In Table I, it can be seen that the prognosis for restoration of hair growth is most favourable (69%) in patients aged 20–30 years, but not in the younger patients aged 16–20 years. In this group 5 (24%) patients progressed in AA totalis or AA universalis.

In Table II, it can be seen that out of the 5 patients with a normal trichogram from the M-region at the first visit, the hair growth was restored in 1 (20%) after a year, whereas this was the case in 55 (63%) out of the 88 patients with an abnormal trichogram. Out of these 55 patients 33 had a telogen, 10 a mixed effluvium and 12 a dysplastic/dystrophic pattern. A remarkable fact was that out of the 25 patients who showed a variable course, in the one with a "normal" trichogram all anagen roots showed angulation $>20°$ and/or deformation of hair shaft and/or hair root. Out of the 24 patients with abnormal trichograms , 10 showed a telogen, 4 a mixed effluvium and 10 a dysplastic/dystrophic pattern. Out of the 9 (10%) of the 88 patients who progressed into AA totalis or AA universalis, 4 showed a telogen effluvium. Most of the telogen hair roots of these patients looked like typical "exclamation mark" hairs, while 5 out of these 9 patients showed a dysplastic/dystrophic pattern. There was no statistically significant association between the clinical features and the dichotomized trichograms ($p = 0.517$, two-sided test).

In Table III it can be seen that out of the 62 patients with a normal trichogram from the C-region at the first visit, the hair growth was restored in 53 (85%) after a year, whereas this was the case in only 6 (19%) of the 31 patients with an abnormal trichogram. Out of these 6 patients, one patient developed lupus erythematosus and another patient developed iron deficiency anaemia. The trichograms in both these patients showed a mixed and telogen effluvium respectively. Out of the 25 patients with a variable course, 17 showed an abnormal trichogram, whereas in 7 out of these 17 patients, a telogen effluvium was observed. In the remaining 10 patients new lesions developed elsewhere on the scalp. Trichograms showed a mixed effluvium in 7 of them and a dysplastic/dystrophic pattern in the remaining 3. None of these patients developed other diseases. Progression into AA totalis or AA universalis was observed in 9 patients. The "normal" trichogram in one of them showed 80% anagen hair roots with angulation $>20°$ and/or deformation of the hair shaft or hair root. Out of the 8 patients with an abnormal trichogram 7 showed a telogen effluvium and one patient a dysplastic/dystrophic pattern. There was a statistically significant association ($p < 0.001$, two-sided). This meant that the prognosis in patients with a normal trichogram was better than in patients with an abnormal trichogram.

DISCUSSION

It is advisable to focus special attention on the presence or the absence of angulation $>20°$ and/or deformation of hair shaft and/or hair root, because one patient with a "normal" trichogram, but aberrant anagen hair roots, progressed in AA totalis, while findings of exclamation hairs at the margin of the lesion indicated the activity of the disease, similar to that observed in a previous study (5).

Moreover, the exact meaning of a dysplastic/dystrophic pattern is not yet known. So far, the trichogram failed to provide any information on the nature of any underlying pathological process. More investigations into this aspect are required and may add to the available knowledge on these various clinical presentations.

Although the number of cases was small (5 patients), progression in AA totalis or AA universalis was not observed in any of the patients with a normal trichogram in the M-region at the first visit.

The fact that an abnormal trichogram in the C-region led to a variable course or to AA totalis or AA universalis after a year suggests that AA is a diffuse process, as reported in a previous study (6).

Abnormal trichograms in the M-region, however, provide no insight into the prognosis of AA, but it is plausible that when the trichogram at the first visit is normal in both regions the prognosis for the restoration of hair growth is favourable. This study shows that the C-region trichogram is a valuable prognostic tool in AA.

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