



Results

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Twenty patients with alopecia areata and five patients with alopecia totalis were studied. They were 14 females and 11 males aging from 6-55 years with a mean age of 25.68 ± 2.11 . The duration of lesion ranging from 6 months to 5 years with a mean duration of 26.04 ± 3.87 .

Ten patients served as a control group.

Reactivity to DPCP

All the twenty-five patients who received the sensitizing dose (2%) of DPCP were successfully sensitized, as manifested by the occurrence of a dermatitic reaction in the alopecic areas in response to topical applications of the drug.

The sensitivity reaction took less than one week up to two weeks to start among the twenty-five patients.

The severity of the sensitivity reaction was either
Mild: showing mild itching and slight erythema.
Moderate: showing severe itching and papules, vesicles .
Severe: showing vesicular and bullous eruptions.

Table (2) shows the correlation between the degree of sensitization and the time of onset of sensitization.

Clinical results

The response in all patients had been assessed according to the grading system as shown in patients and method. Grade 4 (complete hair regrowth) was seen in 17 out of 25 patients (68%). Grade 3 (terminal hair regrowth with patches of alopecia) was seen in 4 out of 25 patients (16%). Grade 2 (sparse pigmented hair regrowth was seen in 2 patients (8%). Two patients showed no response at all (8%), while no patient showed vellus hair regrowth (grade 1), (Table 3).

Response of treatment with DPCP; in group I subgroup A; 10 patients (100%) showed complete hair growth while in group I subgroup B; 6/10 patients (60%) showed complete hair growth, 4/10 patients (40%) showed terminal hair growth with areas of AA. In-group II, only one patient (20%) showed complete hair growth, 2 patients (40%) showed sparse pigmented hair and two patients (40%) showed no response at all, (Table 3 and Fig. 1).

The longer the duration of the lesions the more severe type of alopecia (Table 4 and Fig. 2).

Table 5 and Fig. 3, show the relation between the type of alopecia and the duration needed for complete response to occur. In group I subgroup A (show the milder form of the disease) complete response was achieved in 90% of patients between 9-16 weeks, 10% of patients complete response was achieved before 8 weeks. AT (most severe form of the disease) complete response was achieved in 3 patients (60%) between 17-24 weeks.

The younger age of onset of alopecia showed, the poorer prognosis, (Table 6 and Fig. 4)

In the present study there was no correlation between the degree of clinical response and the age of the patients, sex of the patients and the presence of family history of alopecia (Tables 7, 8, 9 and Fig. 5, 6, 7).

The results of the treatment showed that frontal, temporal and vertex lesions give excellent results. Occipital, multiple patchy

alopecia showed moderate results. (AT) gives the poorest results, (Table 10 and Fig. 8).

Patients with less than 12 months hair loss were (11), ten of them (10/11) showed excellent results (complete hair growth) while one (1/11) showed moderate results (sparse pigmented hair). The two patients who give no response at all have the longer duration of the disease (37-45 months and > 48 months) while shorter duration of lesion had variable responses according to the grading system, (Table 11 and Fig. 9).

Associated diseases were found in 6 patients (24%) including diabetes in one patient (4%), thyroid disease in another patient (4%) and nail involvement in 4 patients (16%). Nail involvement including diffuse fine pitting and longitudinal ridging. Those patients showed the worst results. Nineteen patients had no associated diseases and they showed excellent to moderate results, (Table 12 and Fig. 10).

Follow up of the cases of alopecia treated with DPCP for 6 months showed that 16 patients (64%) show no hair loss, 6 patients (24%) show patchy hair loss and 1 patient (4%) shows complete hair loss, (Table 13 and Fig. 11).

All patients developed localized erythema and pruritus, only two patients (8%) had generalized pruritus without underlying skin changes, relieved by oral antihistaminics. Mild cervical lymphadenopathy occurred in eighteen patients (72%), twelve patients (48%) had suffered from contact dermatitis that occurred as

a blistering and weeping of the scalp, with extension of the dermatitis to the post-auricular area and the nape of the neck. This reaction subsided after withdrawal of DPCP together with the use of oral antihistaminics and local steroids. Three patients (12%) developed mild eczematous rashes in the form of pruritic maculopapular eruption mainly on forearms and trunk. All patients responded to a short course of topical corticosteroids. One patient (4%) developed area of vitiligo at the site of application of DPCP. Two patients (8%) showed pigmentary changes that presented by hyper or hypo-pigmentation. Five patients (20%) treated with DPCP showed no complications. The above results are collected in (Table 14 and Fig. 12).

Table 1: Cumulative data of results of patients with alopecia treated with DPCP.

No	Age (y)	Sex	Degree of alopecia	Age at onset of alopecia (y)	Duration of lesion (mo)	Associated data	Site of lesion	Course of alopecia	Sensit. dose		Time of sensit. R.	Deg of sensit.	Clinical results	Onset of HG (wk)	Time for comp resp (wk)	(complications)				
									Initial	Subseq						Pruritis	Cervical LN	(contact dermatitis)	Eczematous reaction	Vitiligo
1	27	M	AA<50%	26	11	-	Occipital	Recurrent	2%	0.01%	<1wk	Moderate	Complete HG	4	9	-	+	-	-	
2	56	F	AA<50%	55	12	-	Vertex	First	2%	0.001%	<1wk	Severe	Complete HG	5	10	-	+	-	-	
3	20	F	AA<50%	19	6	-	Vertex	Recurrent	2%	0.01%	<1wk	Moderate	Complete HG	5	12	-	+	-	-	
4	32	M	AA<50%	31	6	-	Frontal	Recurrent	2%	0.01%	1-2wk	Mild	Complete HG	4	10	-	-	-	-	
5	23	F	AA<50%	21	24	-	Frontal	First	2%	0.01%	<1wk	Moderate	Complete HG	6	13	-	-	-	-	
6	9	M	AA<50%	5	48	FH of AA	Occipital	Recurrent	2%	0.001%	<1wk	Severe	Complete HG	5	12	-	+	-	-	
7	55	M	AA<50%	54	11	-	Occipital	Recurrent	2%	0.001%	<1wk	Severe	Complete HG	4	9	-	+	-	-	
8	18	F	AA<50%	17	6	DM	Frontal	Recurrent	2%	0.01%	<1wk	Moderate	Complete HG	3	8	-	-	-	-	
9	39	F	AA<50%	38	10	-	Vertex	First	2%	0.01%	<1wk	Moderate	Complete HG	5	12	-	-	-	-	
10	10	F	AA<50%	9	7	-	Frontal	Recurrent	2%	0.01%	1-2 wk	Mild	Complete HG	6	13	-	+	-	-	
11	40	F	AA>50%	37	36	-	Vertex	Recurrent	2%	0.01%	<1wk	Moderate	Complete HG	4	10	-	-	-	-	
12	52	F	AA>50%	51	11	-	Vertex	First	2%	0.01%	<1wk	Moderate	Complete HG	5	13	-	+	-	-	
13	12	M	AA>50%	10	18	Nail invol	Multiple patchy A	Recurrent	2%	0.001%	<1wk	Severe	Term H + AA	8	20	-	+	-	-	
14	11	F	AA>50%	8	36	-	Multiple patchy A	Recurrent	2%	0.01%	<1wk	Moderate	Term H + AA	6	12	-	+	-	-	
15	6	M	AA>50%	5	13	-	Occipital	First	2%	0.01%	1-2 wk	Mild	Complete HG	5	16	-	+	-	-	
16	32	M	AA>50%	28	48	-	Multiple patchy A	Recurrent	2%	0.01%	<1wk	Moderate	Complete HG	7	18	+	+	-	-	
17	8	F	AA>50%	7	12	-	Temporal	Recurrent	2%	0.001%	<1wk	Severe	Complete HG	4	9	-	+	-	-	
18	16	M	AA>50%	12	48	-	Multiple patchy A	First	2%	0.01%	1-2 wk	Mild	Term H + AA	8	19	-	+	-	-	
19	30	M	AA>50%	28	24	-	Occipital	Recurrent	2%	0.01%	<1wk	Moderate	Term H + AA	5	12	-	-	-	-	
20	50	F	AA>50%	48	24	-	Multiple patchy A	First	2%	0.001%	<1wk	Severe	Complete HG	4	10	-	+	-	-	
21	11	F	A.Totals	10	12	-FH of AA -Nail invol	A. totalis	Recurrent	2%	0.001%	<1wk	Severe	Sparse pig H	8	19	-	+	-	+	
22	6	F	A.Totals	2	48	-FH of AA -Nail invol	A. totalis	First	2%	0.001%	<1wk	Severe	No response	-	-	-	+	-	-	
23	8	M	A.Totals	2	72	-FH of AA -Nail invol	A. totalis	First	2%	0.001%	<1wk	Severe	No response	-	-	-	+	-	-	
24	23	M	A.Totals	18	60	FH of AA	A. totalis	Recurrent	2%	0.01%	<1wk	Moderate	Complete HG	6	23	-	-	+	+	
25	48	F	A.Totals	44	48	Thyroid	A. totalis	First	2%	0.01%	<1wk	Moderate	Sparse pig H	7	18	+	+	-	-	

Table 2: Correlation between degree of sensitization and the time of onset of sensitization.

Time of onset Of sensitization	Degree of sensitization		
	Mild	Moderate	Severe
< one week	0	(12) 48%	(9) 36%
1-2 weeks	0	0	0
2 weeks	(4) 16%	0	0
Total	4	12	9
Spearman "r"	-0.6934		
P	<0.0001		

This table shows a highly significant correlation between degree of sensitization and the time of onset of sensitization.

Table 3: Correlation between the type of alopecia and the degree of clinical response in patients treated with DPCP.

Type of alopecia Clinical response	<i>Aareata</i> < 50%	<i>Areata</i> > 50%	<i>Alopecia</i> totalis	Total
<i>No response</i> (Grade 0)	0	0	2 (40%)	2 (8%)
<i>Vellus hair growth</i> (Grade 1)	0	0	0	0
<i>Sparse pigmented hairs</i> (Grade 2)	0	0	2 (40%)	2 (8%)
<i>Terminal hairs + areas of AA</i> (Grade 3)	0	4 (40%)	0	4 (16%)
<i>Complete hair growth</i> (Grade 4)	10 (100%)	6 (60%)	1 (20%)	17 (68%)
Total	10	10	5	25
Spearman "r"	-0.6861			
P	< 0.001			

This table shows a highly significant correlation between the type of alopecia and the degree of clinical response.

Figure 1: Correlation between the type of alopecia and the degree of clinical response in patients treated with DPCP.

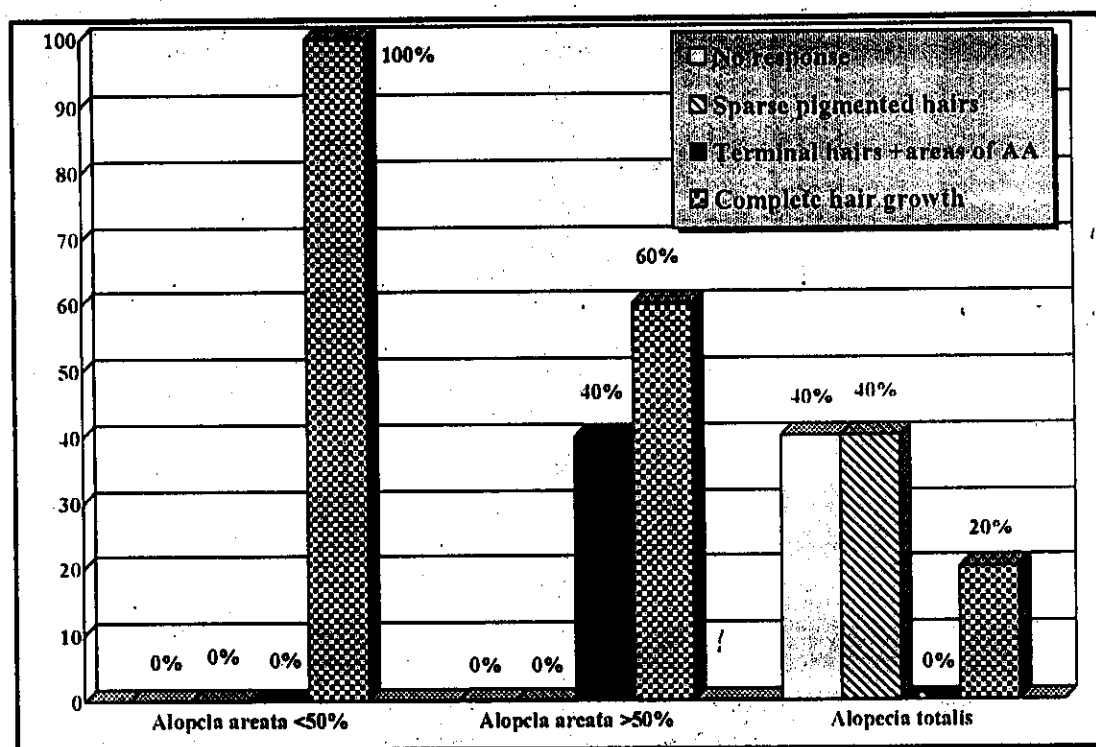


Table 4: Correlation between the type of alopecia and the duration of lesion.

Type of alopecia Duration Of lesion	<i>Aareata</i> < 50%	<i>Areata</i> > 50%	<i>Alopecia</i> <i>totalis</i>	<i>Total</i>
< 13 months	8 (80%)	2 (20%)	1 (20%)	11 (44%)
13-24 months	1 (10%)	4 (40%)	0	5 (20%)
25-36 months	0	2 (20%)	0	2 (8%)
37-48 months	1 (10%)	2 (20%)	2 (40%)	5 (20%)
> 48 months	0	0	2 (40%)	2 (8%)
<i>Total</i>	10 (100%)	10 (100%)	5 (100%)	25 (100%)
<i>Spearman "r"</i>	0.6825			
<i>P</i>	< 0.001			

This table shows a highly significant correlation between the type of alopecia and the duration of the lesion.

Figure 2: Correlation between the type of alopecia and duration of lesion.

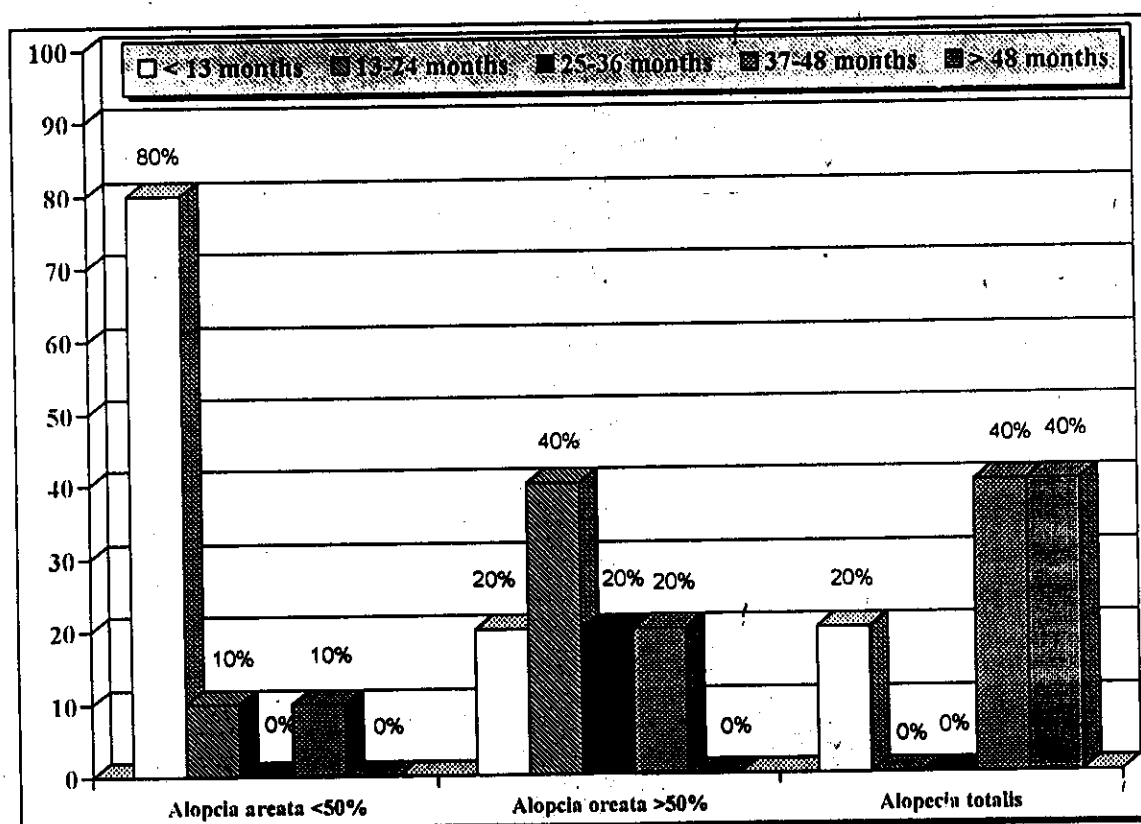


Table 5: Correlation between the type of alopecia and the duration needed for response to occur.

Duration For complete response	Type of alopecia	Aareata < 50%	Areata > 50%	Alopecia totalis	Total
No response		0	0	2 (40%)	2 (8%)
0-8 weeks		1 (10%)	0	0	1 (4%)
9-16 weeks		9 (90%)	7 (70%)	0	16 (64%)
17-24 weeks		0	3 (30%)	3 (60%)	6 (24%)
<i>Total</i>		10 (100%)	10 (100%)	5 (100%)	25 (100%)
<i>Spearman "r"</i>		0.5887			
<i>P</i>		< 0.01			

There was a significant relation between the type of alopecia and the duration needed for complete response to occur.

Fig. 3: Correlation between the type of alopecia and the duration needed for complete response to occur.

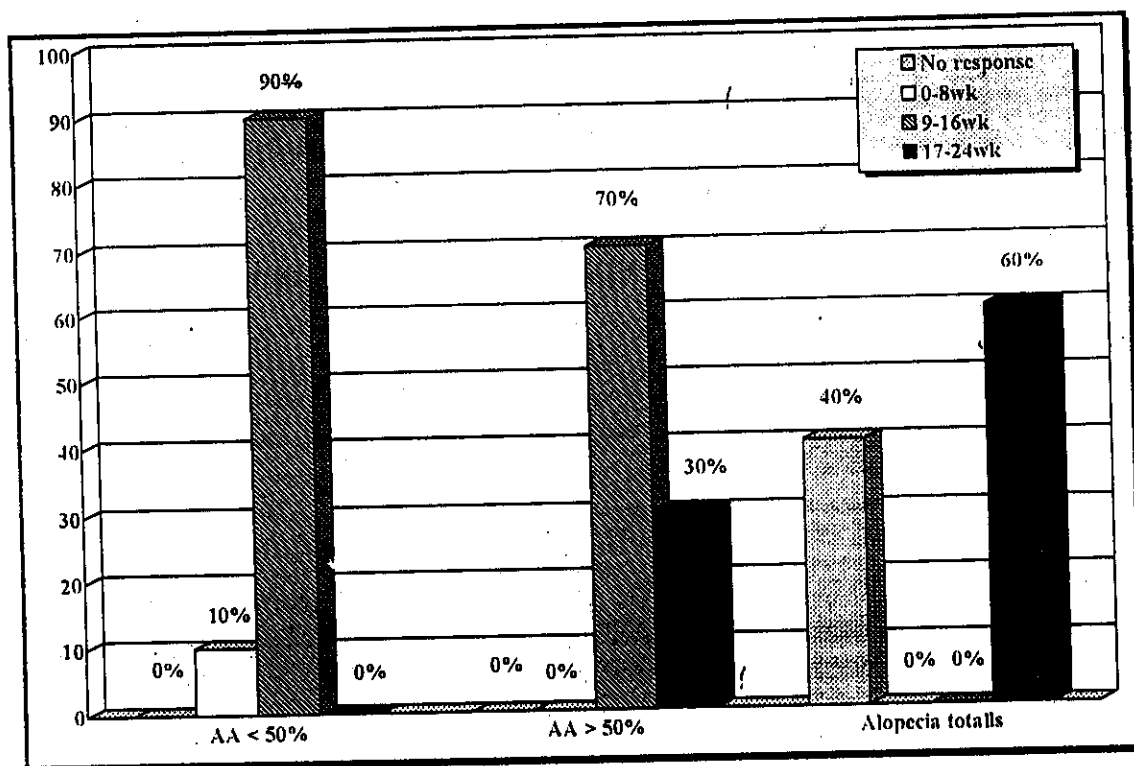


Table 6: Correlation between the age at onset of alopecia and degree of clinical response in patients treated with DPCP.

Response Age of onset of alopecia	Degree of response with DPCP treatment				Total
	No response	Sparse pigmented hairs	Terminal hair + areas of AA	Complete hair growth	
< 16 years	2 (8%)	1 (4%)	3 (12%)	4 (16%)	10 (40%)
16-30 years	0	0	1 (4%)	6 (24%)	7 (28%)
31-45 years	0	0	0	4 (16%)	4 (16%)
> 45 years	0	1 (4%)	0	3 (12%)	4 (16%)
<i>Total</i>	2 (8%)	2 (8%)	4 (16%)	17 (68%)	25 (100%)
<i>Spearman "r"</i>		0.5341			
<i>P</i>		< 0.01			

There was a significant correlation between the degree of clinical response and the age of onset of alopecia in patients treated with DPCP.

Figure 4: Correlation between the age of onset of alopecia and the degree of clinical response in patients treated with DPCP.

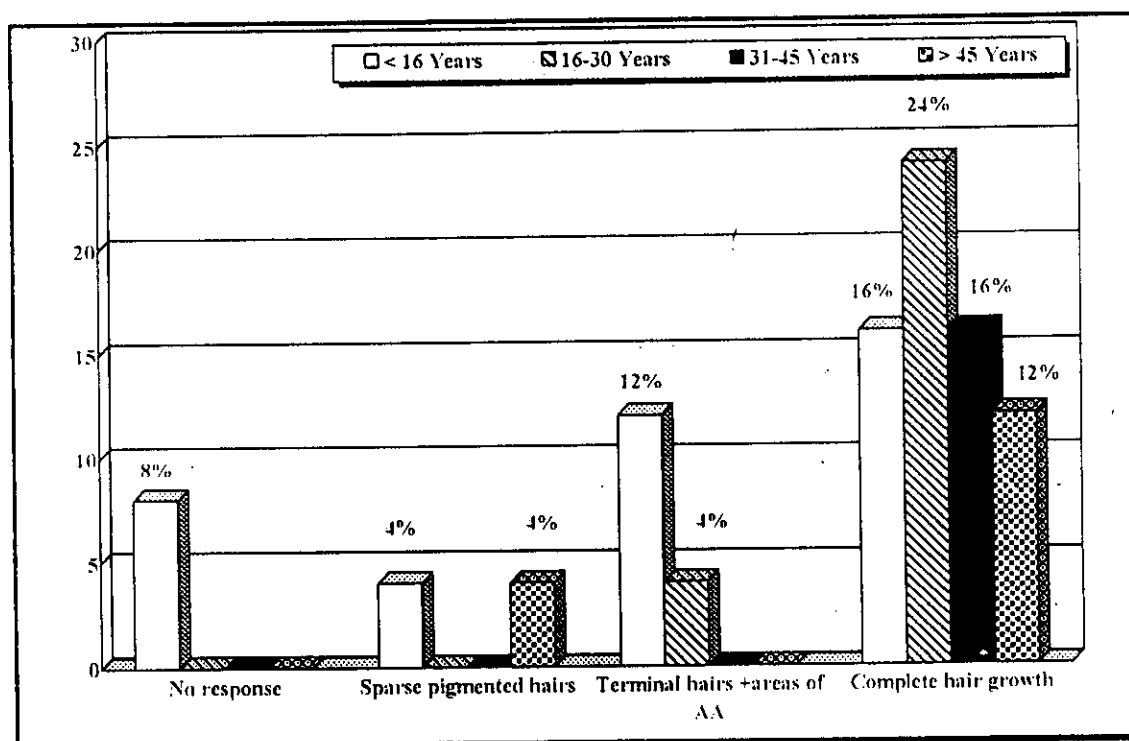


Table 7: Correlation between the degree of clinical response and the age of the patients treated with DPCP.

Response Age	Degree of response with DPCP treatment				Total
	No response	Sparse pigmented hairs	Terminal hair + areas of AA	Complete hair growth	
< 16 years	2 (8%)	1 (4%)	2 (8%)	4 (16%)	9 (36%)
16-30 years	0	0	2 (8%)	5 (20%)	7 (28%)
31-45 years	0	0	0	4 (16%)	4 (16%)
> 45 years	0	1 (4%)	0	4 (16%)	5 (20%)
<i>Total</i>	2 (8%)	2 (8%)	4 (16%)	17 (68%)	25 (100%)
<i>Spearman "r"</i>		0.4651			
<i>P</i>		NS			

There was no significant correlation between the degree of clinical response and the age of the patients treated with DPCP.

Figure 5: Correlation between the degree of clinical response and the age of the patients treated with DPCP.

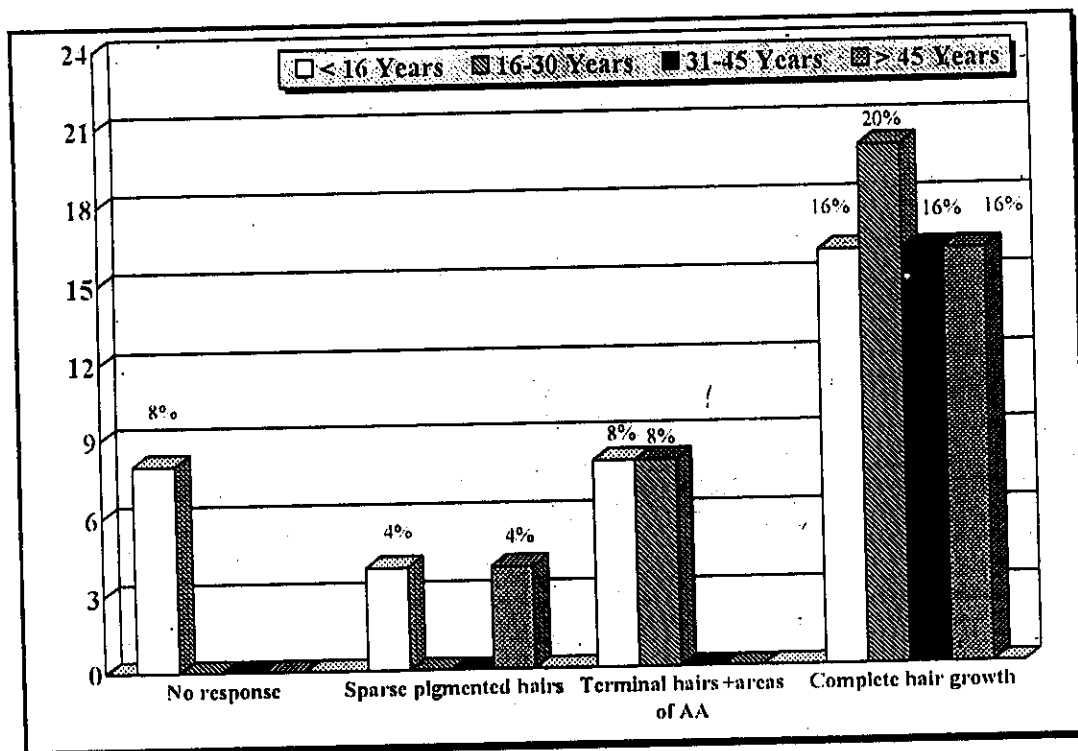


Table 8: Correlation between the degree of clinical response and the sex of the patients treated with DPCP.

Response Sex	Degree of response with DPCP treatment				Total
	No response	Spare pigmented hairs	Terminal hair + areas of AA	Complete hair growth	
Male	1 (4%)	0	3 (12%)	7 (28%)	11 (44%)
Female	1 (4%)	2 (8%)	1 (4%)	10 (40%)	14 (56%)
Total	2 (8%)	2 (8%)	4 (16%)	17 (68%)	25 (100%)
<i>Spearman "r"</i>		0.04061			
<i>P</i>		NS			

There was no significant correlation between the degree of clinical response and the sex of the patients treated with DPCP.

Figure 6: Correlation between the degree of clinical response and the sex of patients treated with DPCCP.

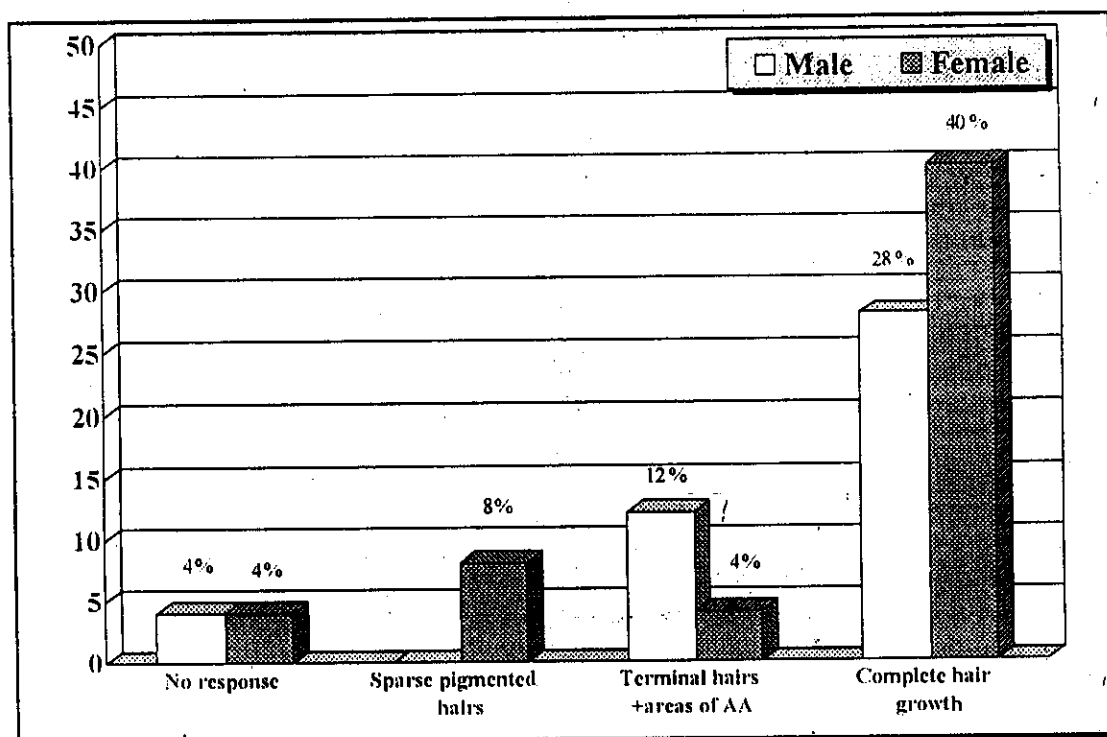


Table 9: Correlation between the degree of clinical response and the presence of family history of alopecia in patients treated with DPCP.

Family History of Alopecia \ Response	Degree of response with DPCP treatment				Total
	No response	Spare pigmented hairs	Terminal hair + areas of AA	Complete hair growth	
Negative	0	1 (4%)	4 (16%)	15 (60%)	20 (80%)
Positive	2 (8%)	1 (4%)	0	2 (8%)	5 (20%)
Total	2 (8%)	2 (8%)	4 (16%)	17 (68%)	25 (100%)
Spearman "r"		- 0.4115			
P		< 0.05			

There was no significant correlation between the degree of clinical response and the presence of family history of alopecia in patients treated with DPCP.

Figure 7: Correlation between the degree of clinical response and the presence of family history of alopecia in patients treated with DPCP.

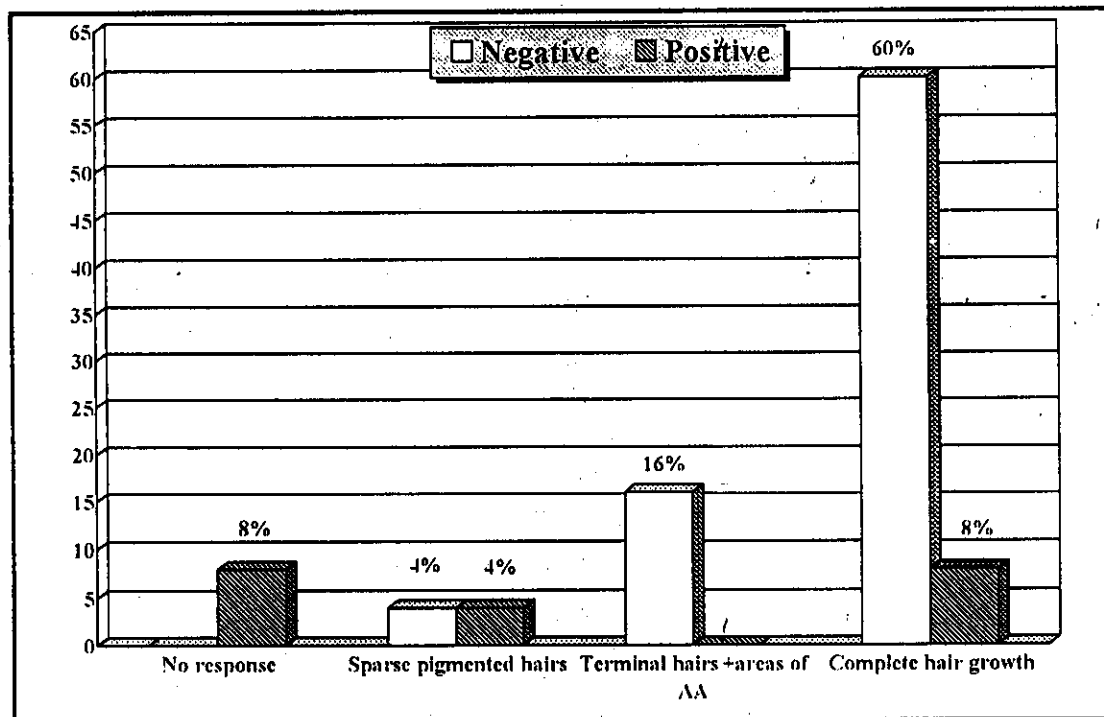


Table 10: Clinical response in different sites of alopecia in patients treated with DPCP.

Response Site of Alopecia	Degree of response with DPCP treatment				Total
	No response	Spare pigmented hairs	Terminal hair + areas of AA	Complete hair growth	
Frontal	0	0	0	4(100%)	4
Temporal	0	0	0	1(100%)	1
Vertex	0	0	0	5(100%)	5
Occipital	0	0	1(20%)	4(80%)	5
Multiple patchy alopecia	0	0	3(60%)	2(40%)	5
Alopecia totalis	2(40%)	2(40%)	0	1(20%)	5
Total	2(8%)	2(8%)	4(16%)	17(68%)	25

Figure 8: Clinical response in different sites of alopecia in patients treated with DPCP.

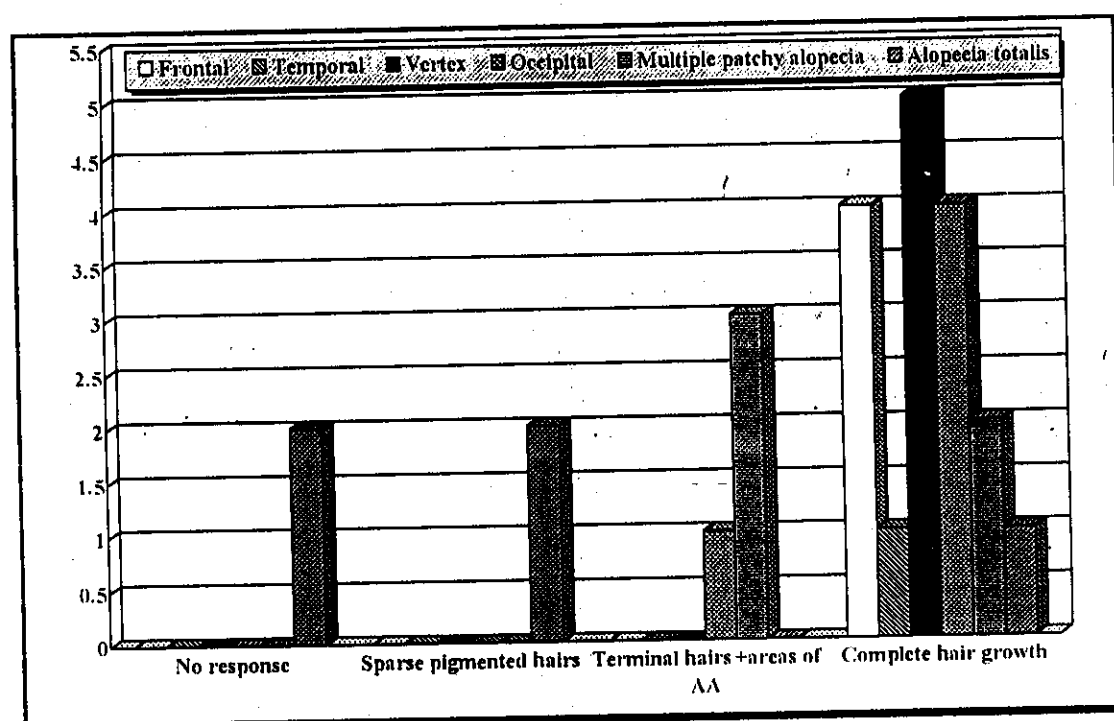


Table 11: Correlation between the degree of clinical response and the duration of alopecia.

Response Duration Of the lesion	Degree of response with DPCP treatment				Total
	No response	Spare pigmented hairs	Terminal hair + areas of AA	Complete hair growth	
0-12 months	0	1 (4%)	0	10 (40%)	11 (44%)
13-24 months	0	0	2 (8%)	3 (12%)	5 (20%)
25-36 months	0	0	1 (4%)	1 (4%)	2 (8%)
37-48 months	1 (4%)	1 (4%)	1 (4%)	2 (8%)	5 (20%)
> 48 months	1 (4%)	0	0	1 (4%)	2 (8%)
<i>Total</i>	2 (8%)	2 (8%)	4 (16%)	17 (68%)	25 (100%)
<i>Spearman "r"</i>		- 0.4969			
<i>P</i>		< 0.05			

There was a significant correlation between the degree of clinical response and the duration of alopecia.

Figure 9: Correlation between the degree of clinical response and the duration of alopecia.

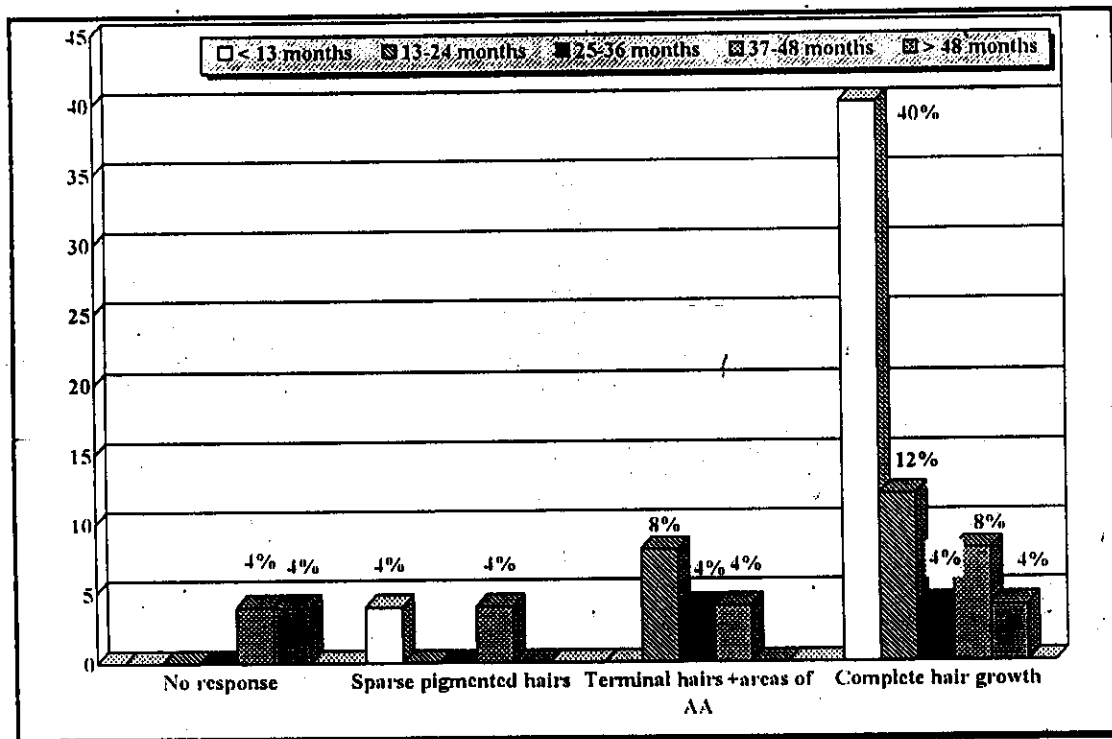


Table 12: Correlation between the degree of clinical response and the presence of associated diseases in patients treated with DPCP.

Response Associated Disease	Degree of response with DPCP treatment				Total
	No response	Spare pigmented hairs	Terminal hair + areas of AA	Complete hair growth	
No associated disease	0	0	3 (12%)	16 (64%)	19(76%)
Diabetes mellitus	0	0	0	1 (4%)	1 (4%)
Nail involvement	2(8%)	1 (4%)	1 (4%)	0	4 (16%)
Thyroid disease	0	1 (4%)	0	0	1 (4%)
<i>Total</i>	2 (8%)	2 (8%)	4 (16%)	17 (68%)	25 (100%)
<i>Spearman "r"</i>	- 0.7001				
<i>P</i>	< 0.0001				

There was a highly significant correlation between the degree of clinical response and the presence of associated diseases in patients treated with DPCP.

Figure 10: Correlation between the degree of clinical response and the presence of associated diseases in patients treated with DPCP.

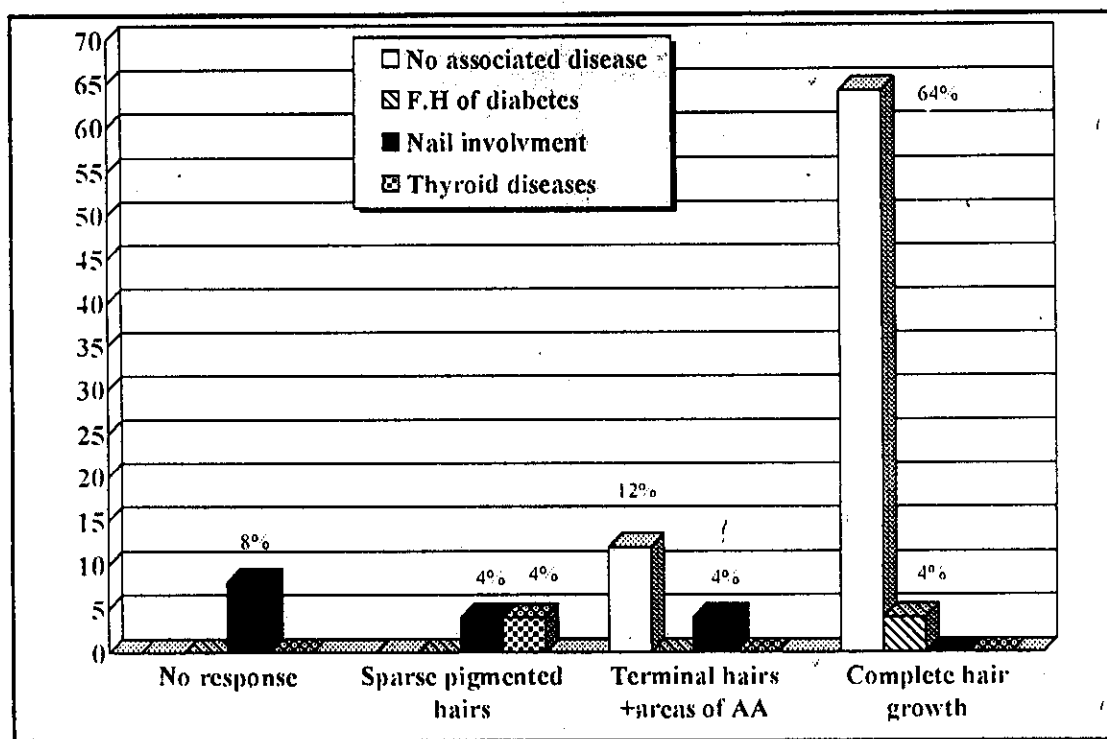


Table 13: Results of 6 months follow-up for patients with alopecia treated with DPCP.

Degree of alopecia Follow-up Results	<i>Aareata</i> <i>< 50%</i>	<i>Areata</i> <i>> 50%</i>	<i>Alopecia</i> <i>totalis</i>	<i>Total</i>
No hair loss	8 (32%)	7(28%)	1 (4%)	16 (64%)
Patchy hair loss	2 (8%)	3 (12%)	1 (4%)	6 (24%)
Complete hair loss	0 (0%)	0 (0%)	1 (4%)	1 (4%)
No response	0 (0%)	0 (0%)	2 (8%)	2 (8%)
<i>Total</i>	10 (40%)	10 (40%)	5 (20%)	25 (100%)

Figure 11: Results of 6 months follow up for patients with alopecia treated with DPCP.

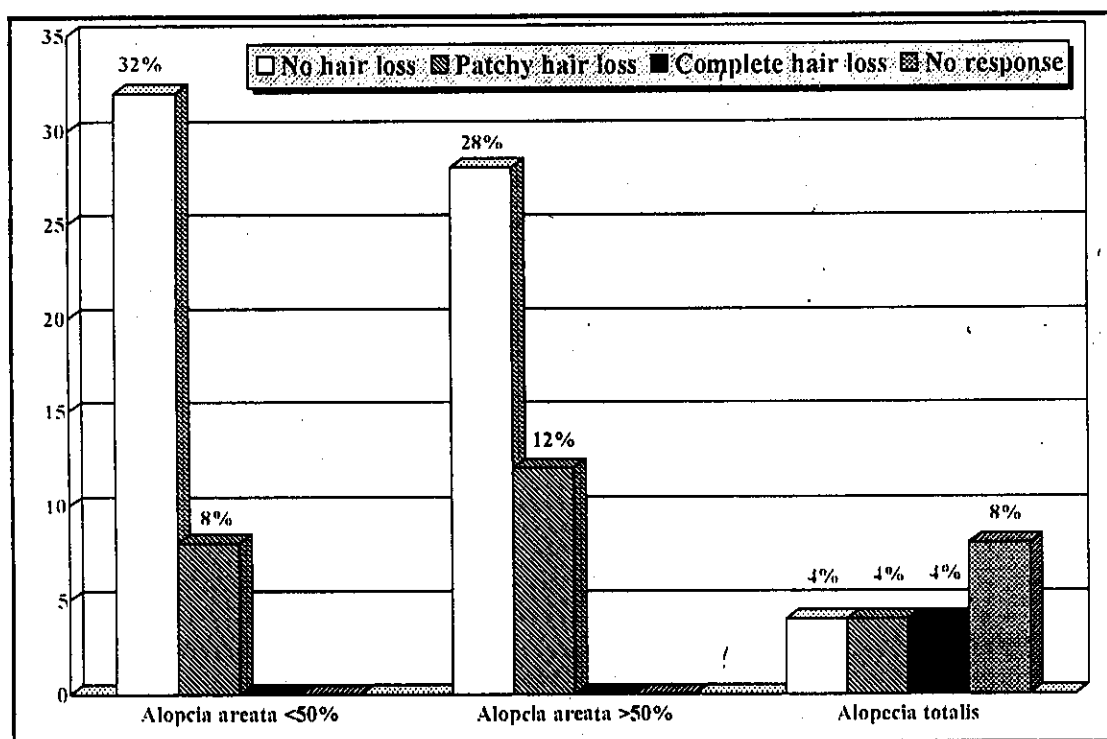
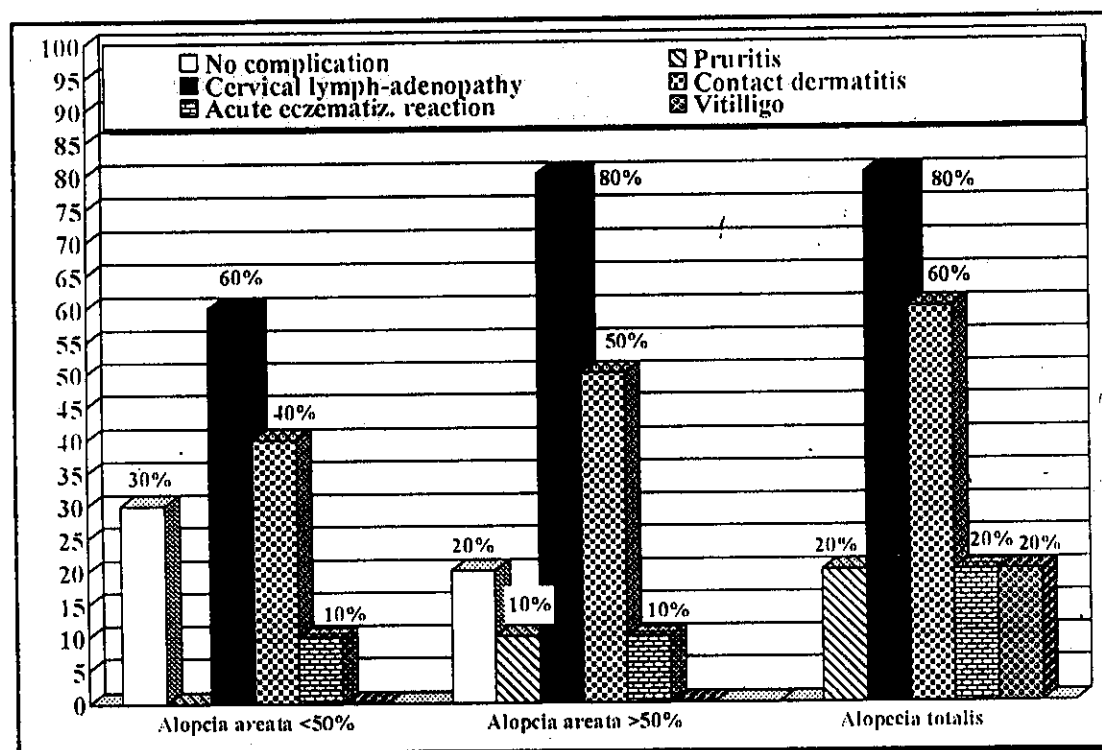


Table 14: Incidence of complications in patients with different degrees of alopecia after treatment with DPCP.

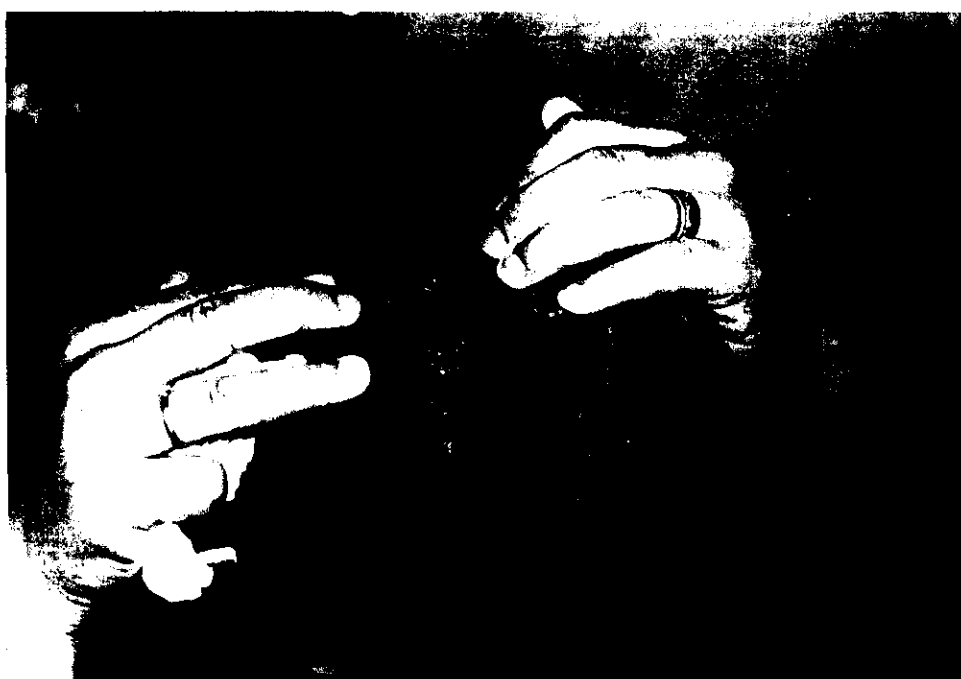
Degree of alopecia Complications	<i>Aareata</i> <i>< 50%</i>	<i>Areata</i> <i>> 50%</i>	<i>Alopecia</i> <i>totalis</i>	<i>Total</i>
No complications	3 (30%)	2 (20%)	0 (0%)	5 (20%)
Pruritis	0 (0%)	1 (10%)	1 (20%)	2 (8%)
Cervical lymphadenopathy	6 (60%)	8 (80%)	4 (80%)	18 (72%)
Contact dermatitis	4 (40%)	5 (50%)	3 (60%)	12 (48%)
Acute eczematous reaction	1 (10%)	1 (10%)	1 (20%)	3 (12%)
Vitilligo	0 (0%)	0 (0%)	1 (20%)	1 (4%)
Pigmentary changes	0 (0%)	0 (0%)	2 (40%)	2 (8%)

Figure 12: Incidence of complications in patients with different degrees of alopecia after treatment with DPCP.





Case no. 1 Group IA before treatment.



Case no. 1 Group IA after treatment.

The patient shows complete hair growth (Grade 4)

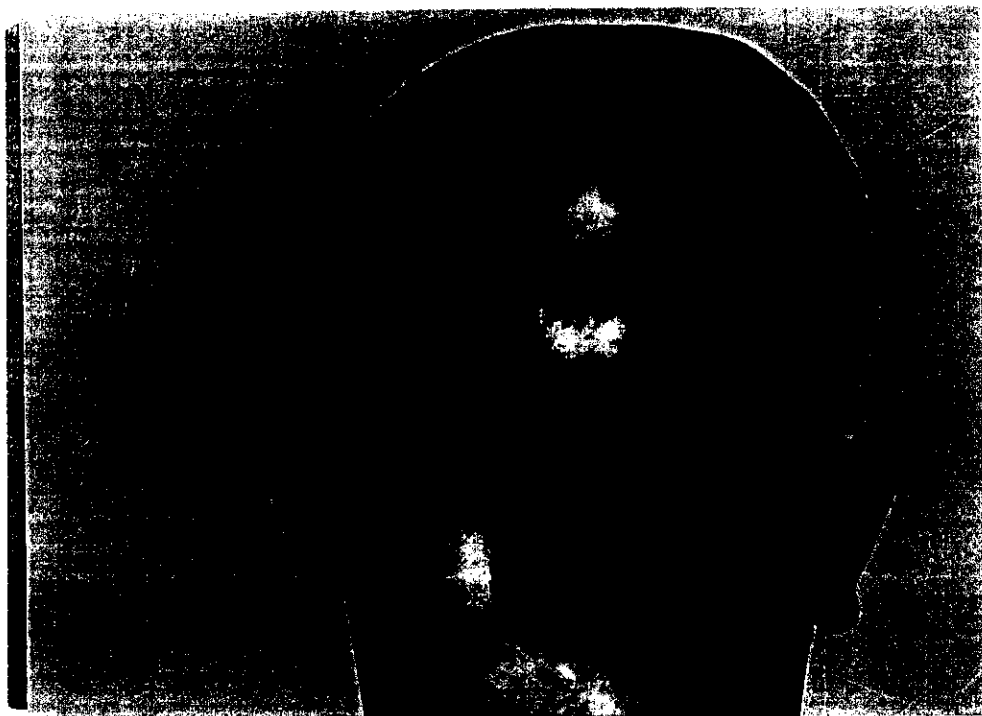


Case no. 2 Group IA before treatment.



Case no. 2 Group IA after treatment.

The patient shows complete hair growth (Grade 4)



Case no. 3 Group IA before treatment.



Case no. 3 Group IA after treatment.

The patient shows complete hair growth (Grade 4)



Case no. 4 Group IA before treatment.



Case no. 4 Group IA after treatment.

The patient shows complete hair growth (Grade 4)



Case no. 5 Group IA before treatment.



Case no. 5 Group IA after treatment.

The patient shows complete hair growth (Grade 4)



Case no. 6 Group IB before treatment.

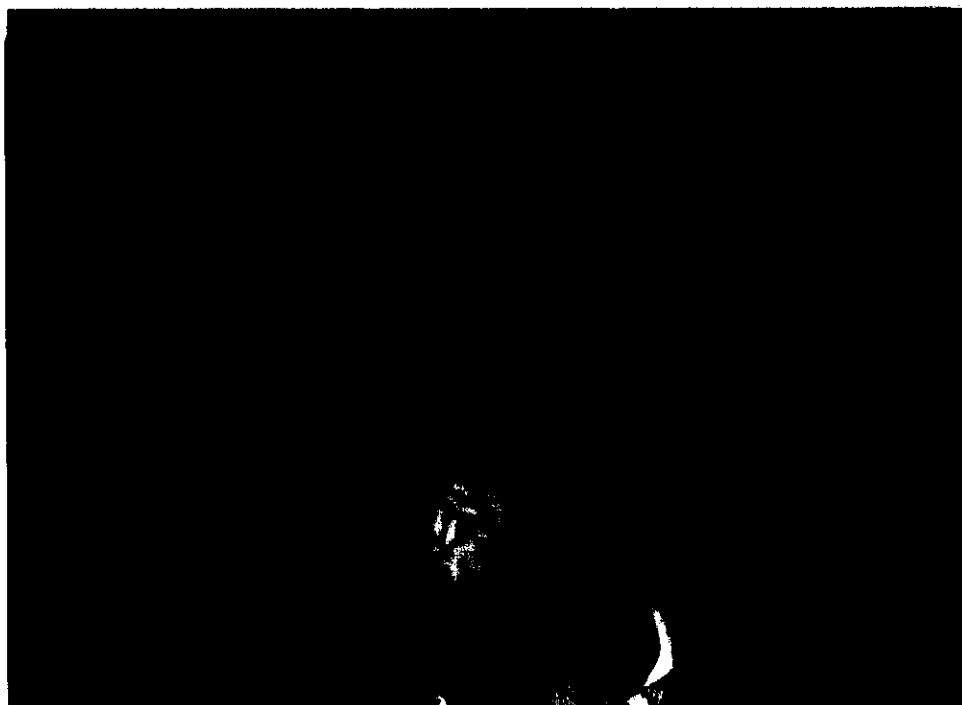


Case no. 6 Group IB after treatment.

The patient shows terminal hair growth with patches of alopecia (Grade 3)



Case no. 7 Group IB before treatment.



Case no. 7 Group IB after treatment.

The patient shows complete hair growth (Grade 4), lateral view



Case no. 7 Group IB before treatment.



Case no. 7 Group IB after treatment.

The patient shows complete hair growth (Grade 4), anterior view



Case no. 7 Group IB before treatment.



Case no. 7 Group IB after treatment.

The patient shows complete hair growth (Grade 4), posterior view



Case no. 8 Group IB before treatment.



Case no. 8 Group IB after treatment.

The patient shows complete hair growth (Grade 4), lateral view

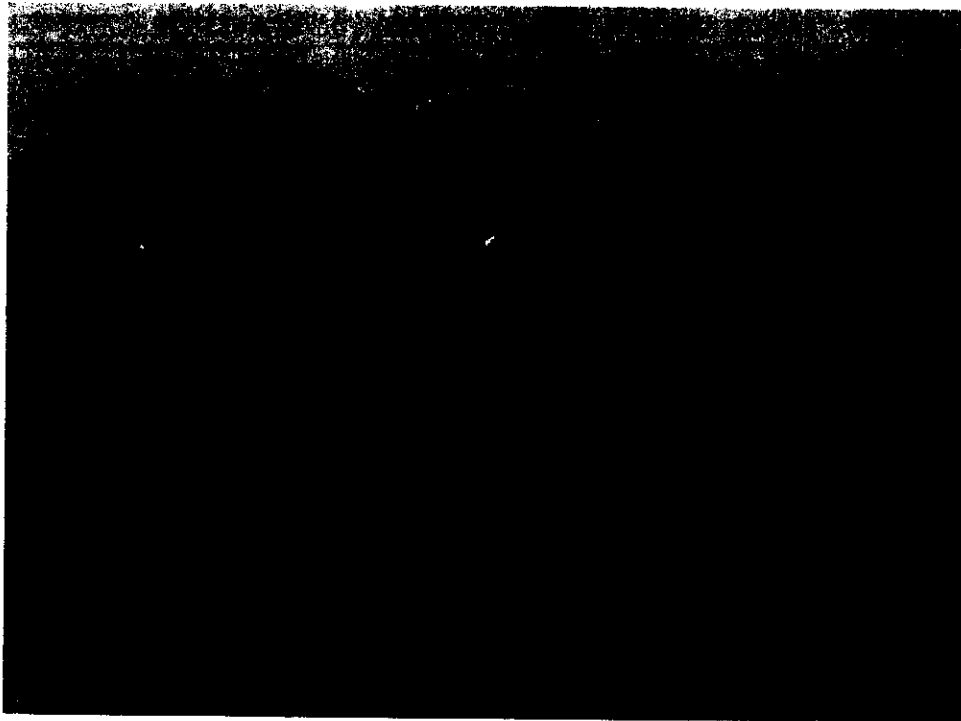


Case no. 8 Group IB before treatment.

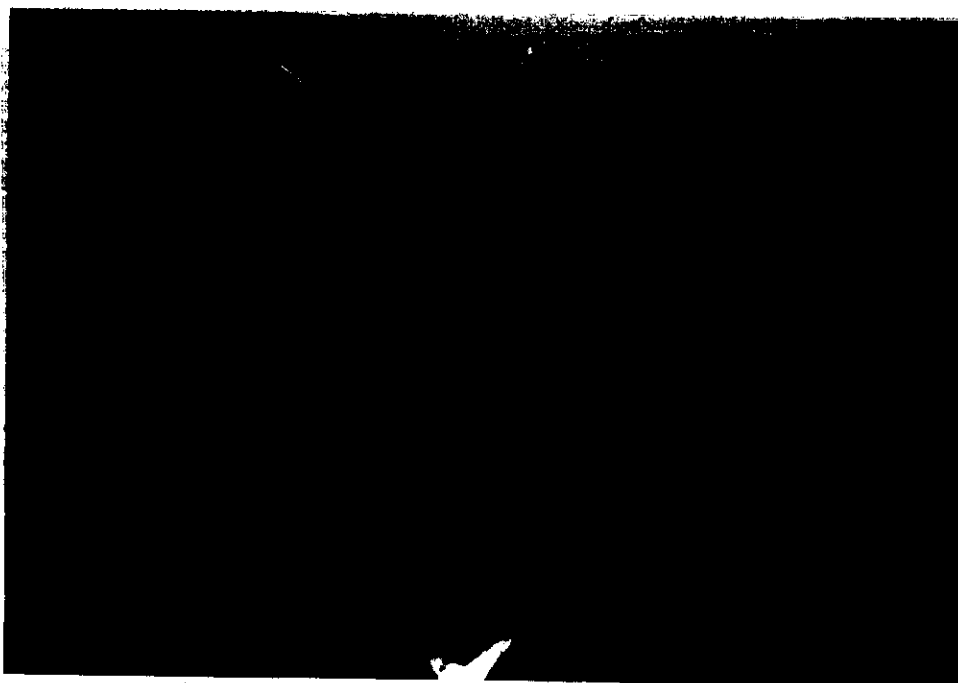


Case no. 8 Group IB after treatment.

The patient shows complete hair growth (Grade 4), anterior view

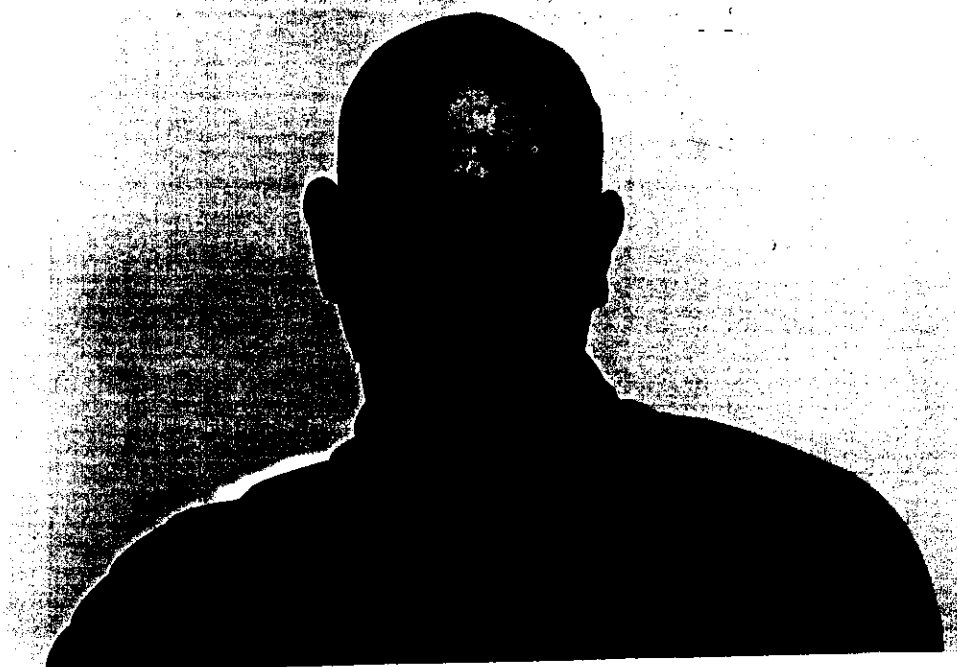


Case no. 9 Group II before treatment.

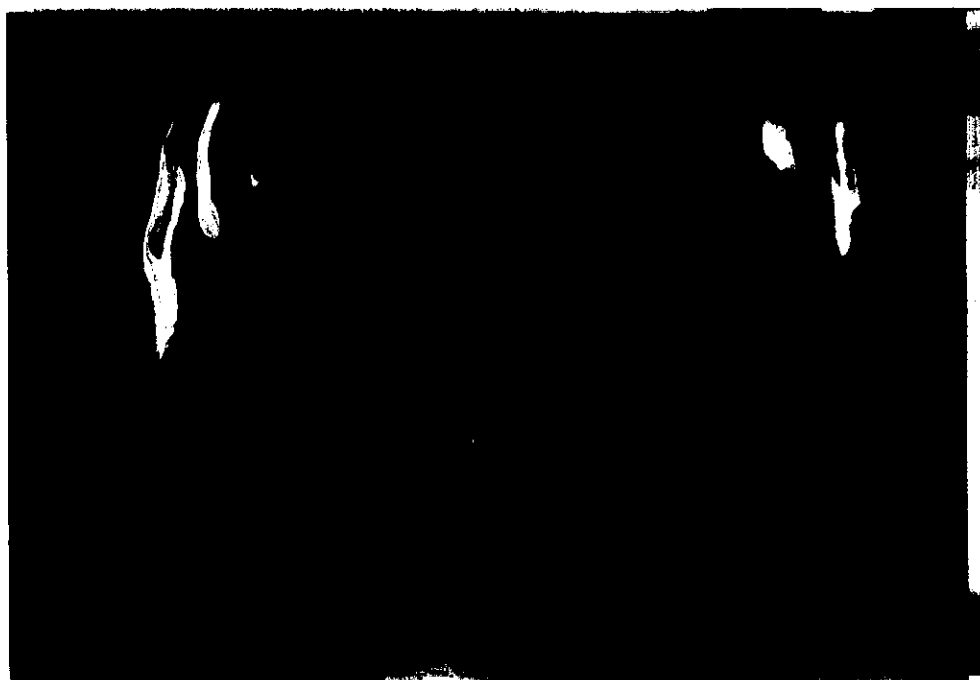


Case no. 9 Group II after treatment.

The patient shows complete hair growth (Grade 4), anterior view

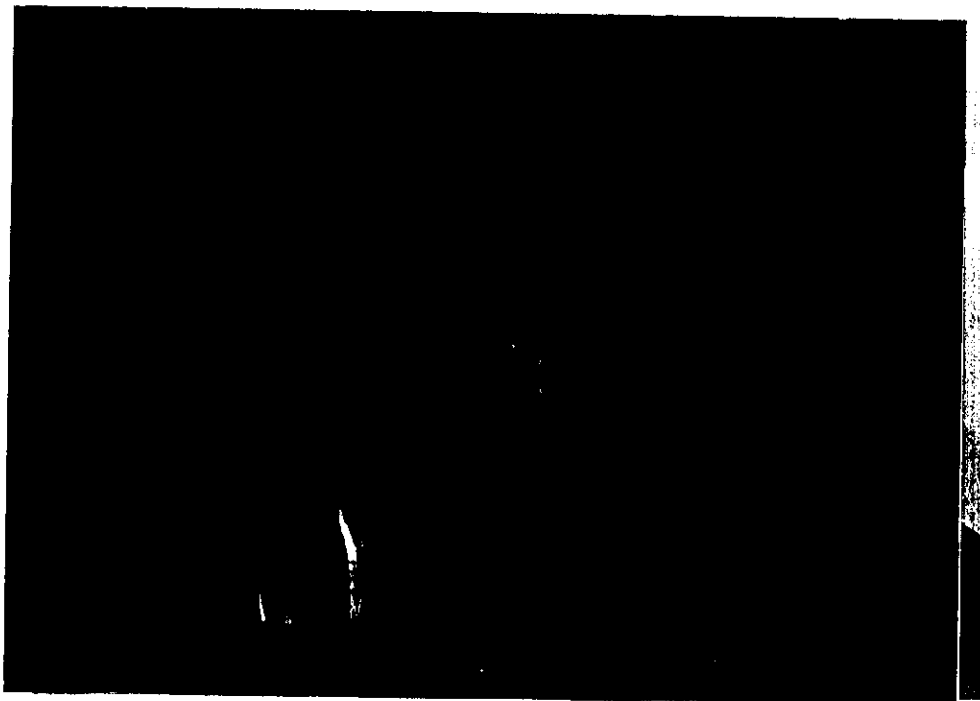


Case no. 9 Group II before treatment.

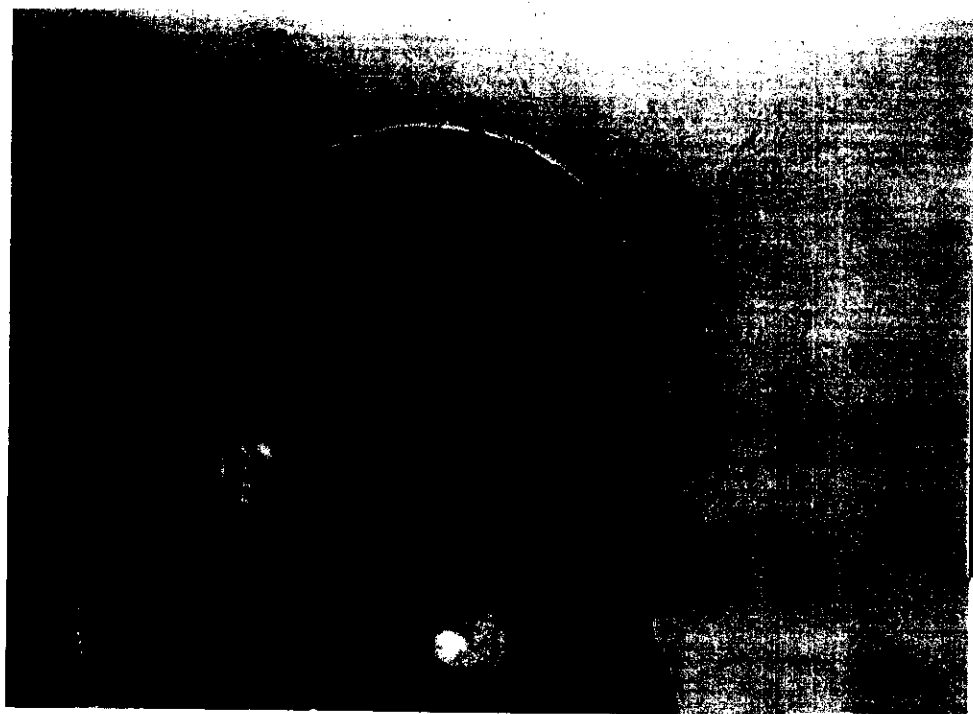


Case no. 9 Group II after treatment.

The patient shows complete hair growth (Grade 4), posterior view



Case no. 9 Group II after treatment left lateral view.



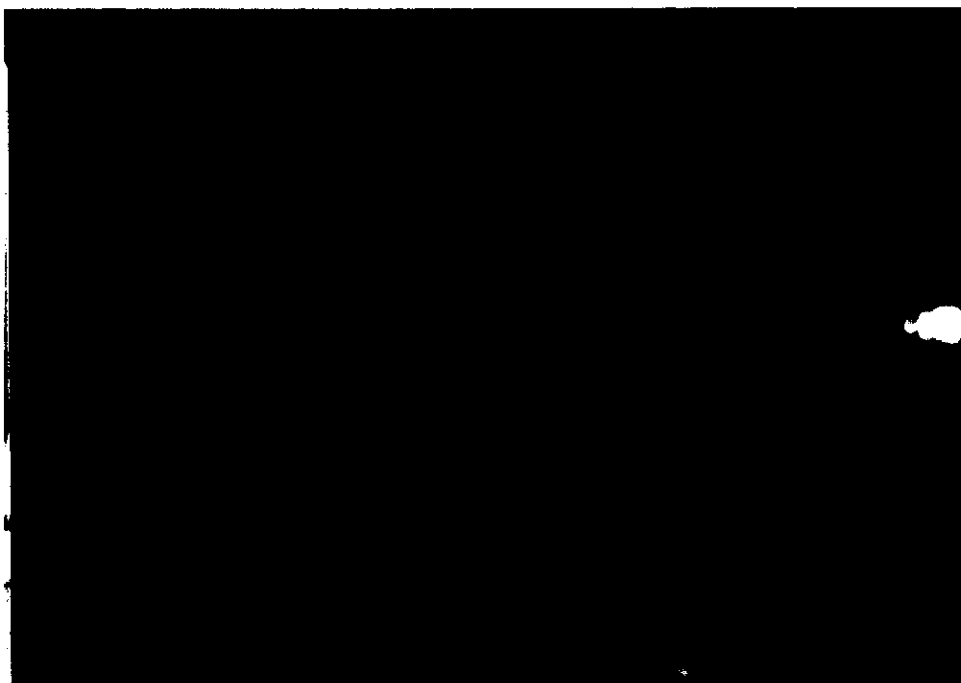
Case no. 9 Group II after treatment right lateral view.

**The patient shows complete hair growth (Grade 4), lateral
view**

Complications



This case shows cervical lymphadenopathy during DPCP treatment.



This case shows pigmentary changes during DPCP.



**This case shows eczematous reaction during DPCP treatment
spreading to the untreated area.**



This case shows mild contact dermatitis during DPCP treatment.



This case shows blister formation during DPCP treatment.



This case shows failure of hair growth on the occipital part of the scalp due to degradation of DPCP at this area because the patient used to wear a cape with an opening which leads to sun exposure to this area of the scalp.