Characteristics of patients with hair loss after isotretinoin treatment: a retrospective review study

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Introduction

Oral isotretinoin (ISO) has been used to successfully treat acne for decades. The side effects of isotretinoin treatment are mostly predictable, minor, temporary, and easily managed[1]. However, one potential and more unpredictable side effect is hair loss, typically telogen effluvium. The percentage of patients that report hair loss after isotretinoin treatment ranges from 0.28% to 12.0%.[1-4] In our study, we aimed to evaluate the association between isotretinoin and alopecia.

Methods

Following approval by the institutional review board (IRB) at the University of California, Los Angeles, a retrospective analysis of patients diagnosed with hair loss (ICD-9 codes of 704.00 Alopecia, unspecified and 704.09 Other alopecia and ICD-10 codes of L64.8 Other androgenic alopecia, L64.9 Androgenic alopecia, unspecified, and L65.9 nonscarring hair loss, unspecified) between 2013 and 2018 was performed. This timeline was chosen due to use of the electronic health record in our institution after 2013. These diagnoses were further clarified by chart review. Patients were screened for concurrent or any past use of isotretinoin. Patients were further compared to other patients in the same time period who were prescribed isotretinoin and did not experience hair loss. Chart review was performed to confirm diagnoses and evaluate for follow up. One-tailed *t*-tests were utilized for statistical analysis.

Results

Of 6330 patients with hair loss, 48 had been prescribed isotretinoin at some time between 2013 and 2018. Of these 48 patients, hair loss occurred concurrently or within two years after taking isotretinoin in 19 patients (39.6%), isotretinoin was used to treat the hair loss, e.g., folliculitis decalvans, in 10 patients (20.8%), and hair loss was pre-existing in the remaining 19 patients (39.6%), as shown in Figure I. The 19 patients in whom hair loss occurred during or after isotretinoin use were further characterized (Table I). Age, sex, total cumulative dose, and duration of treatment were examined (Table II). Eight patients (42%) were deemed solely to have telogen effluvium. Five patients (26%) had findings consistent with androgenetic alopecia with or without telogen effluvium. The remaining six patients (31%) had other diagnoses, though the role of isotretinoin in revealing the underlying pathology is unclear. Overall, compared to patients on isotretinoin without hair loss, patients who developed hair loss were older, had higher cumulative isotretinoin dose, and longer duration of treatment (p = 0.008, p = 0.004, and p < 0.001, respectively).

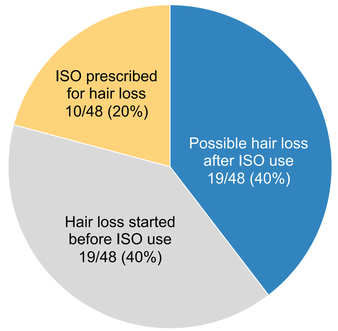

Figure I. Categorizing 48 patients diagnosed with alopecia with a history of isotretinoin treatment; ISO = isotretinoin

Cases	Age (y)/sex	Hair loss diagnoses	Cumulative dose (mg)	Duration of ISO treatment (m)	Taking ISO at time of diagnosis?	Time from ISO onset to hair loss diagnosis (m)	Taking biotin?
1	26/M	Telogen effluvium	7200	4	Y	-	N
2	13/M	Androgenetic alopecia, telogen effluvium	8700	7	Y	-	N
3	16/M	Telogen effluvium	9150	14	Y	-	Y
4	26/F	Androgenetic alopecia	8400	8	N	4	Y
5	25/F	Telogen effluvium	12600	8	Y	-	N
6	20/M	Androgenetic alopecia, telogen effluvium	12000	8	Y	-	N
7	31/M	Androgenetic alopecia	29400	25	Y	-	N
8	20/M	Lichen planopilaris	9000	6	N	10	N
9	29/F	Lichen planopilaris	12900	8	Y	-	N
10	42/M	Androgenetic alopecia	8400	9	Y	-	N
11	48/M	Lichen planopilaris	2400	4	Y	-	N
12	36/M	Alopecia areata	12600	6	N	20	N
13	36/F	Darier disease	16200	9	Y	-	N
14	21/F	Telogen effluvium	8400	5	Y	-	Y
15	20/F	Telogen effluvium	8400	5	Y	-	Y
16	30/F	Telogen effluvium	7200	8	N	6	N
17	31/M	Alopecia areata	1800	3	Y	-	N
18	15/F	Telogen effluvium	9900	6	Y	-	N
19	29/F	Telogen effluvium	15600	14	Y	-	N

Table I. Characteristics of 19 patients who developed hair loss during or after isotretinoin course.

	Patients using ISO with hair loss influence (n = 19)	Patients using ISO and did not have a diagnosis of hair loss (n = 413)	P value
Mean age	27.05 (±9.2)	22.5 (±7.7)	*p = 0.008
Male	10 (52.6%)	212 (51.3%)	p = 0.912
Female	9 (47.4%)	201 (48.7%)	p = 0.912
Average cumulative dose (mg)	10,539.5± 5873.2	8214.7 ± 3594.4	*p = 0.004
Average duration of treatment (m)	8.26 ± 5.0	5.6 ± 2.2	**p < 0.001

Table II. Comparisons between patients using ISO that may have influenced their alopecia and patients using ISO without a diagnosis of alopecia. Overall, compared to patients on isotretinoin without hair loss, patients who developed hair loss after isotretinoin were older, had higher cumulative isotretinoin dose, and longer duration of treatment (p = 0.008, p = 0.004, and p < 0.001, respectively).

Conclusions

In this study, when compared to controls, patients on isotretinoin with hair loss were older, had greater cumulative isotretinoin doses, and longer durations of treatment. Limitations of this study include the small number of patients who experienced hair loss on isotretinoin (n=19) and the retrospective nature of the study. Furthermore, other causes or confounders may have played a role in hair loss as well, such as birth control medication. And despite the findings in this study, oral and topical retinoids have been reported as potentially helpful and used by some as a treatment for frontal fibrosing alopecia and lichen planopilaris.[5] In the future, in addition to exploring the relationship between isotretinoin use and hair loss, studies are needed to better characterize hair loss in general. Additionally, the molecular mechanism linking isotretinoin use and hair is still unclear. Further studies can explore the relationship between biotinidase levels in patients who experience hair loss on isotretinoin, the role isotretinoin may play in lipid metabolism, and the mechanism by which isotretinoin affects sebaceous glands in alopecia.

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