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Nourkrin® Woman with Marilex® Enhances Hair Growth and Appearance and Improves Hair Confidence in Women with Diffuse Hair Loss from Brazil: An Investigator-initiated Clinical Study

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Abstract

Background: Female Pattern Hair Loss (FPHL) and Telogen Effluvium (TE) are common dermatological conditions in women, affecting half of the female population. Treating hair loss in women is more challenging since its pathogenesis is not fully understood and it commonly leads to more serious psychosocial consequences compared to hair loss in men. Recent evidence highlights the involvement of proteoglycan dysmetabolism and follicular hypoglycania as a mediating pathology. Follicular hypoglycania disturbs cellular activity and is behind the gradual deterioration of hair follicles, a condition known as Proteoglycan Follicular Atrophy (PFA). Proteoglycan Replacement Therapy (PRT) with Nourkrin® with Marilex® is a unique approach that helps to treat PFA and restore a normal hair growth cycle.

Methods: We aimed to investigate the treatment satisfaction and subjective efficacy of Nourkrin® with Marilex®. To this end, 67women with moderate to severe FPHL or TE (mean age=42.73 years) were enrolled into an investigator-initiated, subjective, cohort study carried out by practicing dermatologists in Brazil in collaboration with the World Hair Council. Study participants were randomly selected by several collaborating dermatologists and have voluntarily started a 6 month course of monotherapy with Nourkrin® Woman (600mg Marilex® per day). They were interviewed every 3 months using a semi-structured questionnaire.

Results: Just after 3 months, 94.03% and 95.52% of participants reported having experienced improved hair growth and appearance, respectively; and 83.58% were more confident with their hair. All Nourkrin® users were satisfied with the results at this point and were willing to continue with the treatment. At endpoint, 94.03% of subjects experienced enhanced hair growth and 92.54% reported improved appearance of their hair. These positive changes have led 83.58% of participants to feel more confident with their hair. Overall treatment satisfaction rate with Nourkrin® therapy was 97.01%.

Conclusion: Our findings indicate that women with diffuse hair loss found PRT with Nourkrin® an effective approach that stimulates hair growth and improves hair appearance. Treated patients felt more self-confident and were satisfied with Nourkrin® monotherapy.

Introduction

Female Pattern Hair Loss (FPHL) and Telogen Effluvium (TE) are the most common forms of hair growth disorders in women. Surprisingly, FPHL has just recently been recognised by the scientific community as a separate condition from androgenetic alopecia in men (also known as Male Pattern Hair Loss (MPHL)). Hair loss is unexpectedly common among women. Surveys indicate that the lifetime prevalence of FPHL is more than 55% [1]. This means that more than half of women would have to withstand the physical and psychological consequences of hair loss at some point throughout their life. Although hair loss is not a critical medical condition, affected individuals often experience significant psycho-emotional stress that may lead to impaired quality of life and morbid psychiatric disorders, e.g. general anxiety and depression [2]. Hence, clinicians are responsible for offering effective yet safe and sustainable treatment options, specifically to female patients who are more susceptible to psycho-social complications of hair loss.

Detailed pathogeneses of TE, particularly its chronic form, and FPHL are not yet fully disclosed. Despite its symptomatic overlap with MPHL, FPHL is believed to be caused by a different set of aetiological factors that still wait being determined. In any case, androgens do not appear to be the sole driver of hair loss in FPHL, since it occurs in individuals with complete androgen insensitivity syndrome [3]. New insight has originated from the evidence suggesting that 'proteoglycan dysmetabolism' is a central aetiology in diffuse hair loss that connects the effect of external triggers to degenerative follicular changes [4,5]. In affected hair follicles, the capacity to synthesize specific proteoglycans is disturbed, and thus, the concentration of bioactive proteoglycans at anagen is progressively declined. This pathology is in clinical literature known as 'Follicular Hypoglycania (FHG)' and causes a defective extracellular matrix, unable to support the normal growth of follicular cells. Initial stages of FHG cause hair shedding due to shortening of anagen and elongation of telogen as in TE and the first stages of FPHL. In the long term, untreated FHG can lead to gross dysfunction and shrinkage of hair follicles, known as 'Proteoglycan Follicular Atrophy (PFA)'. PFA explains the progressive thinning and miniaturisation of scalp hairs observed in women with FPHL [4].

Recognising the causal roles of proteoglycans in hair loss and

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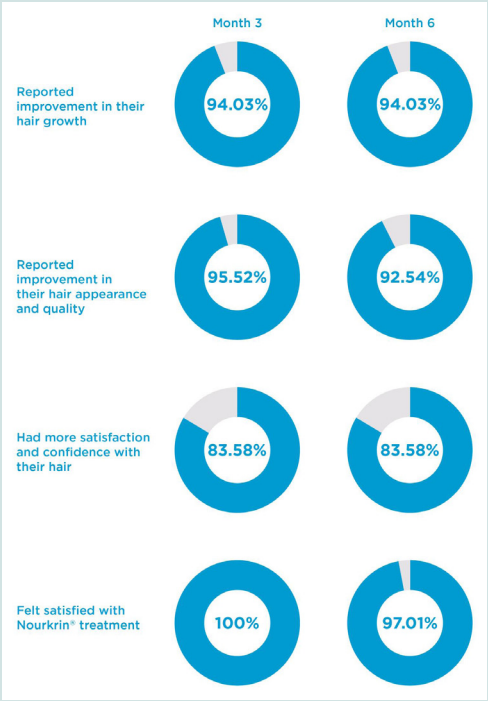

Figure 1: Participants' impression about various effects of treatment with Nourkrin® Woman after 3 and 6 months as assessed by a 2-point scale questionnaire.

thinning has led to the utilisation of proteoglycan-based therapies as a novel approach to hair loss. The Originator Nourkrin® with Marilex®(produced by Pharma Medico Aps, Aarhus, Denmark) uses a specific combination of bioactive proteoglycans with 'anagen inducing' and 'anagen maintaining' properties to mitigate FHG and treat PFA. This unique method is referred to as 'Proteoglycan Replacement Therapy (PRT)' in clinical literature. Numerous clinical trials and papers have confirmed and demonstrated the clinical efficacy and safety of PRT with Nourkrin® in patients with diffuse hair loss [6-9].

In order to provide a more complete picture of the therapeutic effects, tolerability and treatment satisfaction rate of PRT with Nourkrin®, a clinical cohort study by practicing dermatologists was carried out. We have strived in this research to elucidate how the objective clinical improvements by Nourkrin® are subjectively perceived by patients.

Materials and Methods

Study participants

The target population of the current study was female individuals aged 18 to 65 years with non-inflammatory diffuse hair loss diagnosed by a qualified clinician. Sampling was performed by independent collaborating dermatologists in outpatient clinics across major cities in Brazil, including Sao Paulo, Rio de Janeiro and Curitiba. During the screening phase, 98 potential subjects were screened from which 74 were enrolled into the cohort phase of the study. Before recruitment, clinicians gave detailed efficacy and safety information on the Nourkrin® proteoglycan replacement therapy to eligible patients and obtained their consent for participation. Extra information was also provided regarding the availability of other therapeutic options.

The participants agreed to refrain from taking additional anti-hair loss medications or supplements, undergoing laser treatment, hair transplantation or other major surgical procedures involving the scalp and maintain their usual hairstyling practices for the duration of the study. Getting affected by a clinically significant conditionor taking medications known to affect hair growth (e.g. contraceptive pills, anabolic steroids, immune modulators and cytotoxic or cytostatic drugs) during or within six months prior to the study were considered the criteria for exclusion. Pregnant and breastfeeding women were also excluded from participation. Subjects with a known allergy to fish or shellfish were not included as Nourkrin® Woman contains fish-derived compounds.

Study Design. The present study was an open-label, long-term, longitudinal cohort with two follow-up evaluations at month 3 and 6. All participants have voluntarily decided to start a 6-month course of monotherapy with 2 tablets of Nourkrin® Woman (Pharma Medico Aps, Aarhus, Denmark) per day. Each Nourkrin® Woman tablet contains 300 mg of an active ingredient, Marilex®. Marilex® is a proprietary natural extract rich in lecticans and small leucine-rich proteoglycans with hair growth stimulating properties [4].

At baseline, a collaborating dermatologist interviewed each potential subject and exerted a general medical and dermatological evaluation. The severity of hair loss in each patient was graded using Ludwig classification scale for FPHL [10]. After 3 and 6 months of treatment, patients were asked to score the changes that occurred in the growth, quality and appearance of their hair compared to baseline as well as the effect of the treatment on their hair confidence. For each evaluation, a structured, self-administered, 2-point (yes or no) questionnaire was used to assess participants' self-perception and overall treatment satisfaction. In addition, questions on the safety and tolerability of Nourkrin® Woman were included in the questionnaires. Clinical supervision and scientific consultation were generously provided by the members of the World Hair Council (WHC) throughout the study. WHC is a non-profit organization consisting of trichologists, dermatologists and hair loss specialists dedicated to improving the lives of people living with hair growth disorders (https://worldhaircouncil.com).

Results

Out of 74 enrolled participants, 7 failed to report at 3-month time point and thus were eliminated from the final analysis. In this section,

Table 1: Baseline demographics of study participants.

Number of participants	67
Age (years), mean (range)	42.73 (18-64)
Grade of hair thinning/loss (number)	
1 (Mild)	0
2 (Moderate)	35
3 (Severe)	32
Duration of hair thinning/loss (months), mean (range)	151 (2-300)
History of previous therapy (number)	
Yes	49
No	18
Participants with a recent stressful period (%)	49.25%

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data from a per-protocol sample size of 67 is reported. (Table 1) below presents a summary of baseline characteristics of study subjects. As shown, participants were middle aged women with either moderate (52%) or severe (48%) degrees of diffuse hair loss. Despite having a long history of the condition, more than one third of the patients have not been diagnosed previously and never been offered an active medical treatment. Almost half of the subjects reported being under considerable psychological stress.

Recruited individuals have been asked to judge if Nourkrin® therapy had a positive effect on their hair and if they feel more confident with its appearance or not. The obtained results after 3 and 6 months are illustrated in below (Figure 1). Noticeably, the majority of women with advanced forms of diffuse hair loss have reported substantial enhancements in the growth and quality of their hair just after 3 months of Nourkrin® monotherapy. These positive changes resulted in improvements in hair satisfaction and confidence in 84% of the cases. Of note, all users (100%) were satisfied with PRT with Nourkrin® and were willing to continue their treatment after the first 3 months.

At the end of the study period, more than 92% of treated patients believed that Nourkrin® treatment had significantly improved the growth and appearance of their hair and 8 out of 10 users expressed that they feel more confident with their hair than before the treatment. When asked to score their treatment satisfaction, 9 out of 10 participants expressed their positive overall impression.

Participants were closely monitored during the course of the study to detect any newly-onset symptoms or side effects. Six individuals reported minor gastrointestinal, which were of no clinical significance and did not cause any study withdrawals.

Discussion

The subjects under investigation in this study were a group of women diagnosed with diffuse scalp hair loss selected by qualified dermatologists. Reviewing the medical records has brought into light that around one third of the participants had not received any form of medical treatment before participating in this study. This troubling finding implies that many women with hair loss are left undiagnosed and untreated, which roots in the current poor awareness of Female Patten Hair Loss (FPHL) and Telogen Effluvium (TE) among both the public and healthcare professionals. However, even the patients who are fortunate enough to get noticed and receive medical care are frequently unsatisfied with the outcomes. Human trials have shown that more than 50% of women with FPHL do not respond to 2% topical minoxidil and are unsatisfied with this treatment [11].On the other hand, finasteride is no more effective than placebo in women with pattern hair loss [12]. Most patients participating in our study represent the non-respondent, difficult-to-treat patients that are in grave need for a novel and effective treatment.

Proteoglycan Replacement Therapy (PRT) with Nourkrin® is a verified novel therapeutic method that can either be used as a monotherapy or be added to standard hair loss medications. Hence, PRT has great potential to occupy an important position in standard clinical management of hair loss in women, particularly with the current paucity of effective medications. Marilex® is the active ingredient in Nourkrin® Woman that comprises of a unique mixture of marine-derived proteoglycans with hair growth stimulating effects. A recently published, comprehensive review explains how oral administration of Marilex® can regulate the hair growth cycle and stimulate dormant hair follicles to start producing new hair [4]. In two independent randomised, placebo-controlled, clinical trials, 6 months of PRT with Nourkrin® has significantly increased hair density by 32-36% in patients with pattern hair loss. Subjective assessments also indicated a high rate of treatment satisfaction in Nourkrin® users [6,7]. A later trial reported considerable improvements in overall quality of life and all of its sub-scores after adding Nourkrin® to the treatment regimen of women with hair loss [9].

Aligned with the abovementioned objective findings, it was demonstrated in this study that Nourkrin®'s effects are also subjectively perceived as positive and satisfactory by the patients and lead to improvements in the self-esteem of affected women. Although Nourkrin®'s minimum recommended treatment period is 6 months, continuous use of Nourkrin® Woman for just 3 months produced noticeable changes in hair growth and quality in more than 90% of the users (immediate impact). Some experts believe that the immediate impact of Nourkrin® is fundamentally due to the anagen-inducing property of the bioactive proteoglycans abundantly found in Marilex® [13,14]. Improvements in hair growth and appearance persisted throughout the follow-up period and were judged as significant by the absolute majority of patients at the end of the study. This was similar to a previous cohort study conducted in the United Kingdom, which also revealed comparably high efficacy ratings and treatment satisfaction with Nourkrin® [8]. One important clinical aspect of positive patient impression is that not only treatment efficacy results in higher satisfaction rates, but also patient satisfaction may contribute to greater symptom resolution and actual disease improvement in a reciprocal relationship [15].

Of note is that a large proportion of subjects in our study were under psychological stress at the time of enrolment. It is proven that stress can independently aggravate hair loss through triggering an immature anagen termination, promoting telogen, inducing follicular shrinkage and up-regulating apoptosis [16]. Positive effects of Nourkrin® on patients' self-image and self-confidence is hence of great therapeutic value and can indirectly reduce the severity of hair shedding. Moreover, in conditions such as hair loss, the primal goal of treatment is to reduce the psychosocial burden of the disease and improve patients' perceived self-image.

In the modern clinical management of hair loss, choosing a therapeutic approach with an optimal safety/efficacy balance is of utmost importance. Long-term administration of Nourkrin® Woman in our study did not induce any side effects. This finding signifies the safety of Nourkrin® in treating women with diffuse hair loss and confirms the former observational and interventional clinical reports [6-9].

Conclusion

Subjective outcomes of long-term PRT with Nourkrin® with Marilex® were studied in the present longitudinal cohort study. Participants were women with moderate-to-severe FPHL, selected from different dermatology clinics in Brazil. Observations were conclusive as to Nourkrin® therapy produces significant improvements

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in hair growth and appearance in more than 90% of the patients. 8 out of 10 participants stated that they had more confidence in their hair after taking Nourkrin® and all volunteers were willing to continue their PRT after the first 3 months of treatment. Patients' satisfaction rate was notably high at more than 97% after both 3 and 6 months of receiving Nourkrin®. Overall, our findings imply that Nourkrin® is an effective and safe hair loss treatment that offers tangible benefits to the patients and equips the clinicians with an extra tool to manage hair loss in women.

References

1. Gan DC, Sinclair RD (2005) Prevalence of male and female pattern hair loss in Maryborough. J Investig Dermatol Symp Proc 10: 184-189.
2. Hadshiew IM, Foitzik K, Arck PC, Paus R (2004) Burden of hair loss: stress and the underestimated psychosocial impact of telogen effluvium and androgenetic alopecia. J Invest Dermatol 123: 455-457.
3. Cousen P, Messenger A (2010) Female pattern hair loss in complete androgen insensitivity syndrome. Br J Dermatol 162: 1135-1137.
4. Wadstein J, Thom E, Gadzhigoroeva A (2020) The integral roles of specific proteoglycans in hair growth and hair loss - Mechanisms behind the bioactivity of Proteoglycan Replacement Therapy with Nourkrin® with Marilex® in pattern hair loss and telogen effluvium. Dermatol Res Pract 2020: 8125081.
5. Sonthalia S, Deepashree D, Antonella T (2016) Hair restoration in androgenetic alopecia: looking beyond minoxidil, finasteride and hair transplantation. J Cosmetol Trichol 2: 1-13.
6. Thom E (2001) Efficacy and tolerability of Hairgain in individuals with hair loss: a placebo-controlled, double-blind study. J Int Med Res 29: 2-6.
7. Thom E (2006) Nourkrin: objective and subjective effects and tolerability in persons with hair loss. J Int Med Res 34: 514-519.
8. Wadstein J, Thom E (2019) Treating Female Diffuse Hair Loss using Nourkrin® Woman (with Marilex®)-An Open-label, Subjective, Outcome Study on Hair Growth and Appearance, Self-Confidence and Treatment Satisfaction. J Clin Dermatol Ther 5: 037.
9. Kingsley DH, Thom E (2012) Cosmetic hair treatments improve quality of life in women with female pattern hair loss. J Appl Cosmetol 30: 49-59.
10. Ludwig E (1977) Classification of the types of androgenetic alopecia (common baldness) occurring in the female sex. Br J Dermatol 97: 247-254.
11. Jacobs JP, Szpunar CA, Warner ML (1993) Use of topical minoxidil therapy forandrogenetic alopecia in women. Int J Dermatol 32: 758-762.
12. van Zuuren EJ, Fedorowicz Z, Schoones J (2016) Interventions for female pattern hair loss. Cochrane Database Syst Rev 26: CD007628.
13. Inui S, Itami S (2014) A newly discovered linkage between proteoglycans and hair biology: Decorin act as an anagen inducer. Exp Dermatol 23: 547-548.
14. Jing J, Wu XJ, Li YI, Cai SQ, Zheng M, et al. (2014) Expression of decorin throughout the murine hair follicle cycle: hair cycle dependence and anagen phase prolongation. Exp Dermatol 23: 486-491.
15. Dubina MI, O'Neill JL, Feldman SR (2009) Effect of patient satisfaction on outcomes of care. Expert Rev Pharmacoecon Outcomes Res 9: 393-395.
16. Botchkarev VA (2003) Stress and the hair follicle: exploring the connection s. Am JPathol 162: 709-712.

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