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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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No 12 (357) 2024

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A NEW COMBINATION OF KNOWN AGENTS FOR TREATMENT OF ALOPECIA AREATA: A CASE-SERIES STUDY

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Abstract.

Alopecia Areata is an autoimmune disorder that affects hair follicles and results in non-scarring circumscribed areas of baldness that may be localised or widespread.

Actually, we came across many cases with different patterns of hair loss that showed significant improvement after three months duration of treatment with a topical preparation (Freezia cream). The latter was prepared by specialized doctors and pharmacists, and obtained approval from the Iraqi Ministry of Health. Therefore, the current study is a case-series one that showed the presentations of some of these cases and the improvement achieved following treatment with the preparation in question.

Key words. Alopecia areata, hair loss, psychological upset, dermatology, pharmacokinetics.

Introduction.

Alopecia Areata (AA) is an autoimmune disorder that affects hair follicles and results in non-scarring circumscribed areas of baldness that may be localised or widespread and it affects people regardless of their gender, race or age [1]. It is well-agreed that the intention from treating AA is dual, stopping hail loss and enhancing hair growth [2]. However, until 2002 there were no guidelines or agreements from the Food and Drug Administration (FDA) on a drug(s) that can be used for treatment of AA [2], yet in that year baricitinib was approved as an oral medication for treatment of severe AA in adults. Nonetheless, its use was associated with numerous adverse effects such as infection, high mortality rate, carcinogenicity and increased blood clotting [2].

Actually, we come across several cases with different patterns of hair loss that showed significant improvement after three months of treatment with a topical preparation (Freezia cream). The latter was prepared by specialized doctors and pharmacists and obtained approval from the Iraqi Ministry of Health. The cream composed of almond oil, vitamin E, black cumin seed oil, vitamin B complex, tanin 83, folic acid, iron, zinc mustard oil, omega 3 fatty acids, beeswax as well as vitamin A. However, heavy oils (such as olive oil and castor oil) were avoided in the preparation of the cream.

Therefore, current study was a case-series one that presented some of these cases and the improvement achieved following treatment with Freezia cream.

Case 1.

A 25-year-old female presented with asymptomatic area of hair loss at the frontal region of the head of three months duration which seriously affected her appearance and increased her psychological burden. She was healthy, with no family history of similar illness, neither has a history of trauma or systemic disease nor drug-intake history (Figure 1A). On examination, there was a well-defined smooth patch of non-scarring alopecia with no skin changes at the frontal region of the head. Also, scalp examination excluded the presence of scales, redness, depression or another area of hair loss. Laboratory investigations reported a serum level of vitamin D of 27.56ng/ml (Reference range: 30-100ng/dl) and serum zinc of 66µg/dl (Reference range: 73-114µg/dl). She had consulted many dermatologists and had tried different treatment modalities that including minoxidil and systemic steroid without much improvement. Depending on her medical history as well as clinical examination, the case was diagnosed as alopecia areata. The patient was treated with Freezia cream once daily at night for three months. Re-evaluation of the patient condition done after that revealed a substantial hair growth on the frontal area of the scalp (Figure 1B). No systemic or local adverse effects were reported during the treatment or the follow-up period.

Case 2.

A 15-year-old female presented with asymptomatic area of thin hair at the top region of the scalp at the hair parting (Figure 2A) with clumps of hair on combing (Figure 1B) of four months duration causing serious psychological disturbances for her. She was healthy with no family history of similar illness, no history of diabetes, no thyroid gland abnormalities or a drug-intake history. Examination of the scalp revealed a smooth, non-scarring patch of incomplete hair loss with no skin changes at the top region of the scalp. In addition, scalp examination excluded the presence of scales, inflammation, depression or another area of hair loss, however, the remaining hairs within that patch were fragile and easily detached on simple pulling. The latter would explain the clumps of hair that come off on combing (Figure 2B). Laboratory investigations revealed a hemoglobin level of 11.1g/dl (Reference range: 11.5-16g/dl), serum zinc of 77.8µg/dl (Reference range: 73-114 µg/dl), Vitamin D of 27.1ng/ml (Reference range: 30-100ng/dl), and serum calcium of 8.2mg/dl (Reference range: 8.5-10.4ng/dl). She consulted dermatologists and tried different treatment modalities including minoxidil and systemic steroid, but without much improvement. The patient was treated with Freezia cream once daily at night for three months. Re-evaluation of the patient condition done after that which revealed a substantial hair growth on the top region of the scalp (Figure 1C). No systemic or local adverse effects were reported during the treatment or the follow-up period.

Figure 1. *A: Pre-treatment image of case (1) showing non-scarring patch of hair loss at the frontal region of the head. B: Post-treatment image of case (1) showing substantial hair growth after 3 months of treatment with Freezia cream.*

Figure 2. *A: Pre-treatment image of case (2) showing non-scarring patch of hair loss at the top of the scalp. B: Clumps of hair that come-off on combing. C: Post-treatment image of case (2) showing substantial hair growth after 3 months of treatment with Freezia cream.*

Case 3.

A 34-year-old male presented with asymptomatic thinning of hair all over the head (Figure 3A) of six months duration casing serious psychological upset and social isolation for him. He was healthy with no family history of similar illness, no history of diabetes, no thyroid gland abnormalities (confirmed by laboratory thyroid function tests) or a drug-intake history. Examination of the scalp revealed thin hair all over the head without patch(s) of complete hair loss, no scarring, depression, redness or signs of inflammation of the skin all over the head.

Laboratory investigations revealed a serum zinc level of 68.2µg/dl (Reference range: 73-114 µg/dl), Vitamin D of 20.69ng/ml (Reference range: 30-100ng/dl), and serum ferritin of 18.4ng/ml (Reference range: 20-150ng/ml). He had tried different treatments including minoxidil and systemic steroid, but without considerable improvement. The patient was treated with Freezia cream once daily at night for three months. Re-evaluation of the patient condition done after that revealed a substantial hair growth on the top region of the head (Figure 3B). No systemic or local adverse effects were reported during the treatment or the follow-up period.

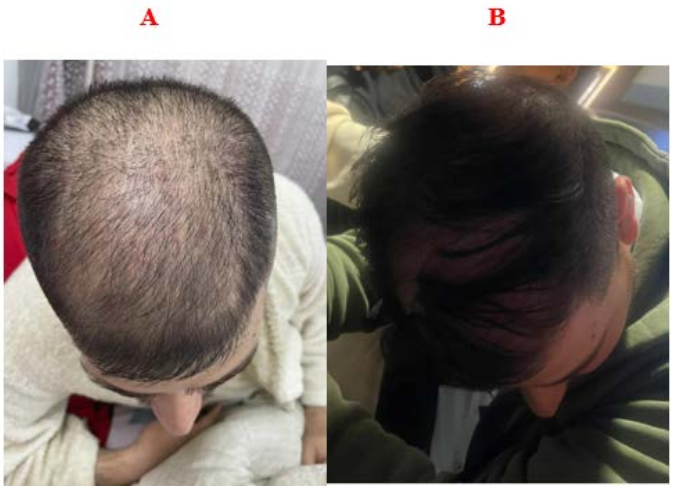

Figure 3. *A: Pre-treatment image of case (3) showing non-scarring hair thinning all over the head. B: Post-treatment image of case (3) showing substantial hair growth after 3 months of treatment with Freezia cream.*

Case 4.

A 28-year-old female presented with asymptomatic area of hair loss at the frontal region of the head (Figure 4A) with clumps of hair on combing (Figure 4B) of four months duration seriously affected her appearance and increased her psychological upset. She was healthy with no family history of similar illness, no history of trauma or systemic disease or drug-intake history. On examination, there was a well-defined smooth patch of non-scarring alopecia with no skin changes at the frontal region of the head. Also, scalp examination excluded the presence of scales, redness, depression or another area of hair loss.

Blood tests showed a vitamin D level of 20.3ng/ml (Reference range: 30-100ng/dl), serum zinc of 66.6µg/dl (Reference range: 73-114µg/dl) and serum ferritin of 18.6ng/ml (Reference range: 20-150ng/ml). She consulted more than one dermatologist and tried different treatment modalities such as minoxidil, oral dietary supplements and systemic steroids, but without much improvement. The patient was treated with Freezia cream once daily at night for three months. Re-evaluation of the patient condition done after that revealed a substantial hair growth on

Figure 4. *A: Pre-treatment image of case (4) showing non-scarring patch of hair loss at the front of the head. B: Clumps of hair that come-off on combing. C: Post-treatment image of case (4) showing substantial hair growth after 3 months of treatment with Freezia cream.*

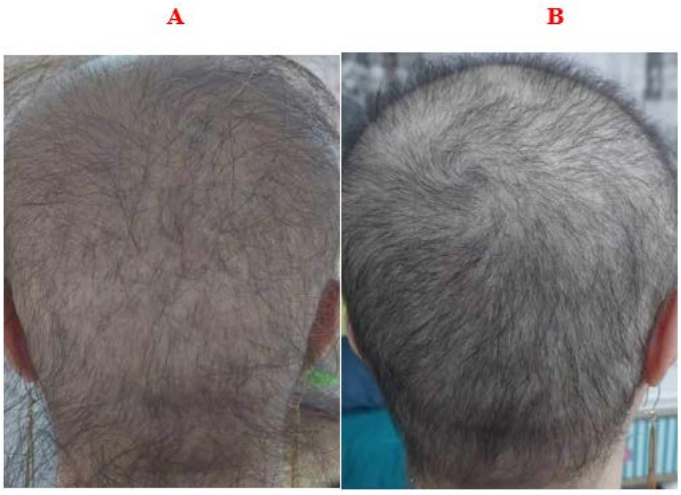

Figure 5. *A: Pre-treatment image of case (5) showing non-scarring thinning of hair at the occipital region of the head. B: Post-treatment image of case (5) showing substantial hair growth after 3 months of treatment with Freezia cream.*

the frontal area of the head (Figure 4C). No systemic or local adverse effects were reported during the treatment or the follow-up period.

Case 5.

A 20-year-old male presented with asymptomatic thinning of hair at the occipital region of the head of seven months duration that caused a significant psychological burden as well as social isolation for him. He was healthy with no family history of similar illness, no history of trauma or systemic disease or drug-intake history (Figure 5A). On examination, the skin was smooth showing extensive thinning of hair with no skin changes or scarring at the occipital region of the head. Also, scalp examination excluded the presence of scales, redness, depression or an area of complete hair loss.

Blood tests revealed a hemoglobin level of 11.7g/dl (Reference range: 11.5-16g/dl), serum zinc level of 70.8µg/dl (Reference range: 73-114 µg/dl), Vitamin D level of 24.1ng/ml (Reference range: 30-100ng/dl), serum calcium level of 9.2mg/dl (Reference range: 8.5-10.4ng/dl) and serum ferritin level of 17ng/ml (Reference range: 20-150ng/ml).

He consulted dermatologists and tried different treatments including minoxidil, oral dietary supplements and systemic steroids, but without considerable improvement. The patient was treated with Freezia cream once daily at night for three months. Re-evaluation of the patient condition done after that revealed a substantial hair growth on the frontal area of the scalp (Figure 5B). No systemic or local adverse effects were reported during the treatment or the follow-up period.

Discussion.

Results from current study showed a dramatic improvement in hair growth that was assessed subjectively by dermatologists, however; it was confirmed by participants' objective perceptions of efficacy. Moreover, the improvement in hair growth reported in current cases will be discussed in light of the beneficial effects of the different ingredients, included in Freezia cream, on hair growth.

The different ingredients included in Freezia cream might have contributed differently to the reported improvement in hair growth. However, these ingredients are the components of different enteral and parenteral preparations, but their bioavailabilities are questionable as they are subjected to pharmacokinetic processes, notably, metabolism [3]. As a consequence, topical application of these ingredients to the scalp might have increased their bioavailability at the hair follicles. The latter could be attributed to a number of factors such as first-pass metabolism, pH of the preparation, particle size and/ or ionization state [3].

It is generally agreed that the micronutrients, included in the Freezia cream, do function as nutritional elements for the hair follicle's normal life cycle and cellular division, especially the fast-dividing cells in the hair bulb. In addition, they act as cofactors in the biosynthesis of keratin, an essential protein for the skeleton and mechanical strength of the hair shaft [4,5].

Vitamin A is required for normal function of the immune system as well as for cellular growth and differentiation. However, a previous study reported that higher concentrations or increased consumption of vitamin A might be associated with hair loss [6].

On the other hand, the B complex vitamins (B2, 7 and 12) and folate act as cofactors for key enzymes involved in cellular functions such gene function, signal transduction, cellular growth and differentiation, as well as metabolism of lipids, carbohydrates and proteins. Moreover, they (except B7) are supplied in diet so that their deficiency would affect hair growth [7,8].

An association between vitamin E and hair loss was suggested by a previous study which reported reduced serum levels of this vitamin in alopecia areata [9]. Also, it is well-documented that vitamin E is an antioxidant that protects against oxidative damage generated by free radicals [9].

Another nutritional element required for the hair follicle is iron. Previous research concluded that hair growth is weakened when there is iron deficiency, and the latter is linked to hair loss in patients with alopecia areata [10,11]. However, other studies did not confirm such an association [12,13]. The impact of iron on hair growth can be concluded from the fact that it (iron) acts as a cofactor for nucleotide reductase, a rate-limiting enzyme for DNA biosynthesis which subsequently affects proliferation of follicular cells and hair growth [14].

The other agent that may influence hair loss is zinc. Deficiency of this element has been strongly linked not only to hair loss in alopecia areata but also to severity and chronicity of this clinical condition [15-17]. It should be supplied in diet, because the human body cannot synthesis zinc. Therefore, its deficiency is quite possible which is partly manifested as hair loss that can be reversed by zinc supplementation [15].

Nowadays, there is a growing focus on employment of alternative treatments for AA such as medicinal plants as it is well-agreed that these plants contain a number of pharmacologically-active phytochemicals (such as alkaloids, phenolic, flavonoids, tannins, oils, glycosides, resin) that proved their usefulness in treatment of different diseases apart from AA [18].

Therefore, one of the ingredients included in the Freezia cream is the almond oil. It can prevent dryness of the scalp and subsequent itching, promotes detachment of dead hairs, it is rich in vitamin B7, rich in unsaturated fatty acids which help lubricate the hair as well as it contains vitamin E, a known antioxidant. In addition, almond oil contains vitamin A and zinc. Therefore, it generates a healthy environment for hair growth and development [17]. Moreover, it moisturizes the skin as it has deeper penetration into the stratum corneum [19]. Taken together, almond oil seems to affect hair growth and to have a useful application in treatment of hair loss in patients with alopecia areata [20].

Furthermore, testosterone is converted in the hair follicles into its active form, dihydrotestosterone, by the enzyme 5α-reductase. The latter can be inhibited by β-sitosterol, an ingredient of the black cumin seed oil [21]. In addition, this ingredient causes a cytokine-mediated upregulation of the keratinocyte growth factor that promotes growth and development of hair follicles [21]. Therefore, the effects of this oil in promoting hair growth and increasing hair density are reported by previous studies [22,23].

The other important oil, for hair growth and well-being, is the mustard oil which contains vitamins A, C, D, E as well as iron, zinc and omega-3 fatty acids [24,25]. Therefore, its antioxidant and antimicrobial effects together with its protective effect against ultraviolet sun light would have contributed to its hair growth-promoting properties reported in current and previous studies.

Furthermore, the impact of omega-3 fatty acids on hair growth was investigated by previous studies which concluded that the docosahexaenoic acid (DHA) enhanced the synthesis of proteins necessary for proliferation of dermal papilla cells and subsequent increase in hair growth [26-28].

Moreover, one of the components included in the preparation under investigation is tannin, also known as tannic acid, [29]. It is a hydrophilic polyphenol ingredient of several herbal foods. In addition, it has been stated that tannins might have anticarcinogenic, antioxidant as well as antimicrobial effects [29]. The latter might support a hair growth- promoting properties of tannins.

The other natural substance increasingly used in cosmetics is beeswax that has antimicrobial, anti-inflammatory as well as hydrating effects [30]. Previous studies revealed that the application of beeswax for 30 days increased hair growth in animals [31,32]. However, the impact of beeswax on promoting hair growth could be attributed to its role in improving the application process of the cream in question and/ or permitting an even application, as well as improving the binding characteristics, of the cream on the scalp [31,32].

Furthermore, it is still debateable whether infections play an active role in the pathogenesis of AA, or the latter puts the patients at an increased risk of infection [33]. However, the latter study concluded that infections (common and viral) are more frequent in patients with AA than in normal people although such infections are not clinically significant. Other studies stated that AA might follow (or be aggravated) by COVID-19 vaccination or swine flu virus [34,35]. Such studies attributed their findings to the possibility of viral- /vaccine-triggered autoimmunity.

Taken together, the preparation in question contains ingredients with potential antimicrobial properties that could prevent or treat any possible infection in AA patients.

Conclusion.

The hair growth-promoting effects of the ingredients included in the cream under investigation could be attributed to their nutritive, antioxidant, anti-inflammatory as well as antimicrobial potentials. In addition, they might have molecular effects on DNA synthesis, signal transduction as well as on cellular metabolism. Also, the enhanced pharmacokinetics of the topically-administered preparation might have improved the bioavailability of these ingredients at the hair follicle microenvironment.

Strengths of study.

- The preparation in question proved effective in treatment of AA in different age groups.
- The effect size of the treatment was big enough to conclude its effectiveness.

Limitations of study.

- Evaluation of response to treatment was done by observation without use of other more objective techniques.

Ethical consideration.

The preparation in question (Freezia cream) was approved by the Iraqi Ministry of Health. In addition, conducting the study was approved by the Directorate of Baghdad Teaching Hospital. Also, verbal consents were obtained from all participants after they were informed by researchers about the purpose of the study as well as the composition of the preparation. Moreover, participants were informed that their participation is completely anonymous, voluntary, they can withdraw at any time as well as their data will only be used for research purposes. Furthermore,

they agreed to publish their pictures, showing response to treatment, anonymously.

Conflict of interest: None.

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