ification by GA. Further studies are required to elucidate the biological and physiological significance of Glycer-AGEs in skin, but our study suggests that they may influence normal human keratinocytes and fibroblasts by different mechanisms and accumulate to a different degree than GO-induced AGEs.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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Scar Sarcoidosis Developed after Blepharoplasty in Acute Lymphoblastic Leukemia Patient

Sue-Jeong Kim, Ji-Young Kim, Myung Im, Young-Joon Seo, Jeung-Hoon Lee, Young Lee

Department of Dermatology, Chungnam National University School of Medicine, Daejeon, Korea

Dear Editor:

A 46-year-old woman presented with linear erythematous papules that developed from a 20-year-old scar on her left upper eyelid 2 weeks earlier. She had undergone an up-

per eyelid blepharoplasty 20 years earlier. She was treated with a topical steroid for 1 week, without improvement. She felt some discomfort while opening her eyes. On physical examination, erythematous, firm, non-tender pap-

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Corresponding author: Young Lee, Department of Dermatology, Chungnam National University School of Medicine, 282 Munhwa-ro, Jung-gu, Daejeon 35015, Korea. Tel: 82-42-280-7706, Fax: 82-42-280-7706, E-mail: resina20@cnu.ac.kr

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ules were seen along the blepharoplasty scar on her left upper eyelid (Fig. 1). She was diagnosed with precursor B cell lymphoblastic leukemia in 2012 and achieved complete remission after allogeneic peripheral blood stem cell transplantation. For a diagnosis and exclusion of leukemia cutis, we performed a skin biopsy. Histological examination showed a dense, non-caseating granulomatous infiltration throughout the dermis, with numerous epithelioid cells. There were no atypical lymphoid cells or immature granulocytes (Fig. 2). These histological findings were consistent with sarcoidosis. A chest X-ray and laboratory studies showed no evidence of systemic sarcoidosis. After 4 months, the lesion improved spontaneously without any treatment.

Sarcoidosis is a multiorgan granulomatous disease with unknown etiology¹. Scar sarcoidosis is a rare form of cutaneous sarcoidosis in which pre-existing scars are infiltrated

by non-caseating granulomas. Scar sarcoidosis can develop after various events; although there are a few reports on scar sarcoidosis developing after blepharoplasty². Moreover, there has been no report on scar sarcoidosis occurring on an old blepharoplasty scar in a leukemia patient after a surgical procedure. The patient had blepharoplasty on both upper eyelids, but the sarcoidosis appeared only on the left side. We don't know the exact mechanism for this, but different pre-operation state of upper eyelids, surgeon's skill or different post-operation care could be the reason for the asymmetric appearance of scar sarcoidosis. Similar to our case, Mantese et al.³ reported the patients who was diagnosed with scar sarcoidosis that developed only part of the scars. Although the patient had blepharoplasty, hysterectomy and caesarean, she had sarcoidosis on left upper eyelid and on the left lateral side of infra-umbilical scar.

There have been several reports on sarcoidosis related to hematological malignancies. Among these, only four reports described sarcoidosis that developed after acute leukemia, after a period ranging from 11 months to 17 years⁴. There are several hypotheses to explain the relationship between acute leukemia and sarcoidosis. First, the granulomatous inflammation of sarcoidosis may develop in reaction to the tumor-associated antigens found in acute leukemia². Second, the transmission of sarcoidosis or sarcoidosis-inducing pathogens via bone marrow transplantation may be associated with the development of sarcoidosis⁵. Scar sarcoidosis can resolve slowly and spontaneously⁶, although many treatments have been used for cutaneous sarcoidosis. For patients with only cutaneous sarcoidosis, with no systemic involvement, systemic treatment is not necessary and topical and intralesional steroids can be helpful. When there is systemic involvement, systemic treatment with hydroxychloroquine, prednisolone, or me-

Fig. 1. Erythematous linear papules along left upper eyelid.

Fig. 2. (A, B) Histologic specimen (H&E) shows dense, numerous non-caseating granulomatous infiltrations in entire dermis with epithelioid cells (A: $\times 10$, B: $\times 100$) and (C) asteroid body ($\times 400$).

thotrexate can be helpful.

This case is a rare occurrence of sarcoidosis that developed on an old upper blepharoplasty scar in a leukemia patient. We suggest a skin biopsy to exclude scar sarcoidosis when firm papules appear on a scar in leukemia patients.

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CONFLICTS OF INTEREST

The authors have nothing to disclose.

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The Association between Exercise and Androgenetic Alopecia: A Survey-Based Study

Jaewoong Choi, Myungsoo Jun, Solam Lee, Sung-Soo Oh¹, Won-Soo Lee

Department of Dermatology, Institute of Hair and Cosmetic Medicine, Yonsei University Wonju College of Medicine, ¹Department of Occupational and Environmental Medicine, Yonsei University Wonju College of Medicine, Wonju, Korea

Dear Editor:

Androgenetic alopecia (AGA) is the most common type of hair loss¹. Both genetic and non-genetic factors are known to play a role in development of AGA². Many studies have focused on the non-genetic factors of AGA, but few have investigated the association between AGA and exercise.

We perform a survey-based study to shed a light on the association among AGA and exercise. This study was approved by the institutional review board of Yonsei University Wonju College of Medicine (YWMR-15-0-071). The subjects visited occupational medical clinic of Wonju Severance Christian Hospital for regular medical check up

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Corresponding author: Won-Soo Lee, Department of Dermatology, Institute of Hair and Cosmetic Medicine, Yonsei University Wonju College of Medicine, 20 Ilisan-ro, Wonju 26426, Korea. Tel: 82-33-741-1345, Fax: 82-33-748-2650, E-mail: leewonsoo@yonsei.ac.kr

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