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Evaluation of Nuclear Factor-E2- Related Factor 2 in Alopecia Areata Patients; A Correlation with Systemic Oxidative Stress

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Alopecia areata (AA) is a common dermatologic disease with autoimmune etiology. Systemic and tissue oxidative stress are present in AA. Nuclear factor-E2-related factor 2 (Nrf2) is a transcription factor which stimulates transcription of antioxidant genes. The current work aimed to investigate the role of Nrf2 in systemic oxidative stress in AA. Thirty cases with AA and 30 age and gender matched healthy subjects were included. Cases were diagnosed clinically and by dermoscopy and evaluated according to severity of alopecia tool (SALT) score. Nrf2, total oxidant capacity and total antioxidant capacity were measured by enzyme linked immunosorbent assay (ELISA). Oxidative stress index was then calculated. Serum Nrf2 and total antioxidant capacity were significantly lower in AA than control group ($P < 0.001$ for both), while total oxidant capacity and oxidative stress index were significantly higher in AA than control group ($P < 0.001$ for both). There was a significant negative correlation between total antioxidant capacity and age ($r = -0.5$, $P = 0.004$). High Nrf2 serum level was significantly associated with positive hair pull test (86.7%) while low Nrf2 was significantly associated with alopecia totalis ($P = 0.02$ for both). There was significant positive correlation between NRF2 and total antioxidant capacity ($r = 0.43$, $P = 0.01$) and significant negative correlation between NRF2 and total oxidant capacity ($r = -0.44$, $P = 0.01$) and between NRF2 and oxidative stress index ($r = -0.46$, $P = 0.01$). Therefore, Nrf2 is lower in AA than control indicating that systemic oxidative stress may be, at least in part, due to low Nrf2. The association between low Nrf2 and alopecia totalis compared with patchy alopecia may be due to destruction of Nrf2 by high oxidative stress in totalis variant. The use of Nrf2 activators may be beneficial in severe, resistant or recurrent cases.

Biography:

Dr. Ola Bakry has completed her PhD in 2010 from Menoufiya Faculty of Medicine. She is working as an assistant professor of Dermatology and Andrology in Menoufiya Faculty of Medicine. She has published more than 70 papers in reputed journals in the fields of Clinical Dermatology, Dermatopathology and Aesthetic Medicine. She is a reviewer and editorial board member of many international journals.

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