Letter to Editor

Decreased glucose-6-phosphate dehydrogenase levels in vitiligo patients: Further evidence of oxidative stress

Sir,

Vitiligo is an acquired skin depigmentation disorder affecting 1% of the world population.[1] Pathogenesis of vitiligo is complex and not yet fully understood. Oxidative stress has been proposed to be one of the major players in the pathogenesis of vitiligo.[1,2] Glucose-6-phophate dehydrogenase (G6PD) is one of the main antioxidant enzymes in the body.[3] The low erythrocyte levels of this enzyme have been shown to be a reliable indicator of oxidative stress.[3] The aim of this study was to evaluate the role of oxidative stress in the pathogenesis of vitiligo by comparing the erythrocyte levels of G6PD between vitiligo patients and healthy controls.

In this IRB-approved two-group cross-sectional comparative study, 30 patients with vitiligo were enrolled as cases. Of these 30 patients, 25 had generalized and 5 had segmental vitiligo. Exclusion criteria were receiving treatment for vitiligo within the past 3 months before enrollment, history of any other systemic disorder, history of drug or alcohol dependency or cigarette smoking, and use of one of certain specified medications within 1 month before enrollment (corticosteroids, non-steroidal anti-inflammatory drugs, and antioxidant supplements). Thirty age and sex matched healthy subjects were also enrolled as controls.

After giving informed consent, venous blood samples were obtained from all cases and controls. Erythrocyte G6PD levels were measured by Beutler's method.[4] Statistical analyses were performed using the SPSS base 16. Quantitative data were compared between two groups using Mann-Whitney U Test; categorical data were compared using the chi-square test. $P < 0.05$ was considered to be statistically significant.

Cases and controls were similar in terms of age (39.3 ± 12.8 vs. 39.5 ± 12.3 years, $P = 0.9$) and sex (male/female ratio=1 in both groups, $P = 1.0$). The erythrocyte G6PD levels were significantly lower in vitiligo patients compared to controls (12.5 ± 5.4 U/g Hb vs. 16.6 ± 3.3 U/g Hb, $P = 0.003$). However, erythrocyte G6PD levels were similar between generalized and segmental vitiligo patients (12.8 ± 6.1 U/g Hb vs. 14.4 ± 2.9 U/gr Hb; $P = 0.6$).

Oxidative stress is increasingly considered as one of the major players in the pathogenesis of vitiligo.[1,2] Several studies have demonstrated the increased levels of oxidative stress markers like malondialdehyde (MDA) and decreased levels of anti-oxidant factors like superoxide dismutase in vitiligo patients.[1,4] In two previous studies from India and Turkey, the levels of G6PD, one of the major antioxidant enzymes, have also been shown to be significantly lower in patients with vitiligo compared with healthy controls.[4,5] Similarly, in our study, the cellular levels of G6PD were significantly lower in vitiligo patients compared with healthy controls. Moreover, in our study, the cellular levels of G6PD were similar between patients with segmental and generalized vitiligo. Similarly, in a study by Akoglue *et al*.,[6] patients with generalized and segmental vitiligo had similar total oxidant and antioxidant statuses.

In conclusion, the results of our study in accordance with previous studies show that vitiligo patients have lower levels of the antioxidant enzyme, G6PD. Larger studies on vitiligo patients with different demographic backgrounds are needed to further evaluate the role of oxidative stress in the pathogenesis of this enigmatic disorder.

Amir Farahi-Jahromy, Mohammad Kazem Fallahzadeh[1], Soheil Ashkani-Esfahani[2], Nasrin Hamidizadeh, Mahsa Ghavipisheh[3], Mohammad Reza Namazi

Skin Research Center, Shiraz University of Medical Sciences, Shiraz, [1]WK Transplant Center, Shreveport, LA, USA, [2]Student Research Center, Fasa University of Medical Sciences, Fasa, [3]Shiraz Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran

Address for correspondence: Dr. Mohammad Reza Namazi, Shiraz Skin Research Center, Faghihi Hospital, Shiraz, Iran.
E-mail: namazi_mr@yahoo.com

REFERENCES

1. Laddha NC, Dwivedi M, Mansuri MS, Gani AR, Ansarullah M, Ramachandran AV, *et al*. Vitiligo: Interplay between oxidative stress and immune system. Exp Dermatol 2013;22:245-50.
2. Bahmani M, Fallahzadeh MK, Jowkar F, Khalesi M, Bahri-Najafi R, Namazi MR. Can topical phenytoin augment the therapeutic efficacy of PUVA against vitiligo? A double-blind, randomized, bilateral-comparison, placebo-controlled study. J Dermatolog Treat 2011;22:106-8.
3. Ho HY, Cheng ML, Chiu DT. Glucose-6-phosphate dehydrogenase-

from oxidative stress to cellular functions and degenerative diseases. Redox Rep 2007;12:109-18.
4. Arican O, Kurutas EB. Oxidative stress in the blood of patients with active localized vitiligo. Acta Dermatovenerol Alp Panonica Adriat 2008;17:12-6.
5. Agrawal D, Shajil EM, Marfatia YS, Begum R. Study on the antioxidant status of vitiligo patients of different age groups in Baroda. Pigment Cell Res 2004;17:289-94.
6. Akoglu G, Emre S, Metin A, Akbas A, Yorulmaz A, Isikoglu S, *et al*. Evaluation of total oxidant and antioxidant status in localized and generalized vitiligo. Clin Exp Dermatol 2013;20 [In Press].

Access this article online

Quick Response Code:

Website: www.advbiores.net

DOI: 10.4103/2277-9175.124686