



The evaluation of oxidative stress in vitiligo patients in kerbala province before and after the treatment with vitamin E

Mohammed Talat Abbas ¹, Zeyad Tarek Habeeb ²

¹ Department of Pharmaceutical Chemistry, College of Pharmacy, University of Kerbala, Kerbala, IRAQ

² Department of Chemistry, College of Education for Pure Science, University of Kerbala, Kerbala, IRAQ

Abstract

The main objective of this trial is to estimate the level of MDA and evaluate the effectiveness of total antioxidants in vitiligo patients and in addition to find out whether vitamin E has a role in prevention or treatment in the treatment of vitiligo. The duration of the study lasted for two months and was conducted in the city of Karbala and in Al-Husseini Hospital, the study was conducted on 25 patients with vitiligo disease and some biochemical tests were measured in serum patients before and after treatment with vitamin E. The number of volunteers for a healthy group was 25. In this trial, there was a significant reduction in the effectiveness of antioxidants and a significant elevate in MDA levels in vitiligo as compare to group of normal or healthy group, but this elevate in MDA begin to decline and at the same time start the effectiveness of antioxidants rise after treatment with vitamin A. It has been concluded that vitamin E acts as a potent anti-oxidant and it is possible and likely to reduce oxidative stress which is a major cause of vitiligo.

Keywords: Vitiligo, Malondialdehyde, total antioxidant capacity

Abbas MT, Habeeb ZT (2019) The evaluation of oxidative stress in vitiligo patients in kerbala province before and after the treatment with vitamin E. Eurasia J Biosci 13: 359-361.

© 2019 Abbas and Habeeb

This is an open-access article distributed under the terms of the Creative Commons Attribution License.

INTRODUCTION

Vitiligo is one of the acquired diseases characterized by presence of a white spot on patient's skin, caused by the fall in melanocytes (Sravani 2009). About one to two percent of the world's population is infected with vitiligo due to the melanin disorder. The main cause of vitiligo is unknown yet, but maybe that the immune and nervous side and the genetic side play an important role in the development of disease (Arun et al. 2016, Hann and Nordlund 2000, Sravani 2009).

Any disorders or disturbance between antioxidant levels and free radical production leads to oxidative stress (OS) (Abbas et al. 2018). OS is one of basic factors in vitiligo by degeneration of the pigment cells with the accumulation of high percentage of H₂O₂ in the skin of the person with vitiligo (Metta et al. 2014). Vit. E is a fat-soluble have eight types of tocopherol but the most important type is alpha-tocopherol. The most roles of vitamin E is antioxidants in addition to other important functions (Yilmaz et al. 2017).

This study designed to assess level of total antioxidants and percentage of malondialdehyde in the blood of a person infected with vitiligo before and after treatment with vitamin E.

SUBJECT AND METHODS

The study carried out at Al Hussein Hospital (peace be upon him) educational in the holy city of Karbala in the Department of Dermatology. The study was divided into 2 groups, the 1st group included 25 patients with local and general vitiligo disease (about 10 mm of blood was withdrawn from vitiligo patients before and after two months of treatment with vitamin E 400 IU/daily) (McArdle et al. 2004). The second group included 25 healthy persons as a control. Patients suffering from certain diseases such as diabetes, thyroid, as well as autoimmune disorders or associated skin diseases have been excluded. In both groups the activity of total antioxidant (TAO) and MDA levels are evaluated.

BIOCHEMICAL ANALYSIS

By the ELISA methods the TOA activities and MDA levels are estimated.

STATISTICAL ANALYSIS

By SPSS programs, the statistical analysis were performed and expressed as mean \pm SD.

Received: September 2018

Accepted: March 2019

Printed: May 2019

Table 1. The levels of MDA levels and Total antioxidant capacity in vitiligo patients before and after treatment with vitamin E

parameters	Control groups	Vitiligo groups before treatment with Vitamin E	Vitiligo groups after treatment with Vitamin E
	Mean± SD	Mean± SD	Mean± SD
MDA (n mol/mg)	0.145±0.001 ^a	0.71±0.03 ^p	0.21±0.02 ^a
TOA	533.11± 31.66	123.12±13.12	500.21±9.11

RESULTS

Compared to the healthy group, as shown clearly in **Table 1**, there was a significant elevated in MDA in group of people with vitiligo. However, the increase in the level of the MDA decreases significantly and the levels are close to normal levels after treatment with vitamin E for two consecutive months. In addition, there was a significant decrease in the effectiveness of antioxidants in group of vitiligo compared to healthy group, but after giving patients with vitiligo vitamin E, the antioxidant activity starts to rise clearly compared to the pre-treatment.

DISCUSSION

The study was designed to assess oxidative stress in vitiligo patients before and after treatment with alpha-tocopherol.

The problem of vitiligo is basically a cosmetic problem and more often the disease leads to social and emotional consequences in addition to depression and social anxiety and vitiligo is a very complex disease and so far is not known why (Alikhan et al. 2011, Ines et al. 2006). Several studies have shown OS have very important roles in appearance of vitiligo. In the destruction of melanocytes it is believed that oxidative stress has a significant role in the process (Kovacs 1998, Maresca et al. 1997). In normal conditions, antioxidants have major roles within cells in keeping cellular levels of reactive oxygen species by remaining low levels because low levels of free radicals are harmless to cells. On the contrary, high levels of reactive oxygen in

humans, there are harmful effects of cell components such as protein, fat and DNA (Ozougwu 2016, Ece and Tünay 2018). Any disturbance or imbalance between cells producing reactive oxygen and levels of antioxidants leads to a condition called (OS) .Which have a large role in inductions of many cancers and various diseases, including vitiligo (Abbas et al. 2018, Nasiri et al. 2014).

In our current studies, we noticed an increased in levels of MDA and decreases in the effectiveness of total antioxidants capacity in Vitiligo. MDA is a precursor to the occurrence of the lipidperoxidation, the increase in levels indicating a cell crash, but after treatment of patients with vitamin E and for two months dose Four hundred IU and daily observed the significant and significant decline in MDA levels, we also have noticed a significant increase in the total antioxidant activity. This is explained by the fact that vitamin E has antioxidant function, which works to reduce free radical levels (Bulgakov et al. 2018, Yilmaz et al. 2017).

CONCLUSIONS

At the end of this study we concluded that the oxidative stress increases in vitiligo disease, but this increase begins to decrease gradually after starting treatment with vitamin E.

ACKNOWLEDGEMENT

We offer our thanks and appreciation to all patients and healthy volunteers who have been drawn blood samples from them in order to carry out this important study.

REFERENCES

- Abbas MT, AL-Tuma RR, Mohammed MJ (2018) The Assessment of Oxidative State in Kerbala Patients with Benign Prostatic Hyperplasia Before and After The Surgery. *Biochem. Cell. Arch.*, 18(2): 1751-3.
- Abbas MT, et al. (2018) The prophylactic-protective effect of camel milk on ethanol induced hepato-toxicity in newborn rats. *Eurasia J Bioscience*, 12: 503-9.
- Alikhan A, Felsten LM, Daly M, Petronic-Rosic V (2011) Vitiligo: a comprehensive overview Part I. Introduction, epidemiology, quality of life, diagnosis, differential diagnosis, associations, histopathology, etiology, and work-up. *J Am Acad Dermatol*, 65(3): 473–91. <https://doi.org/10.1016/j.jaad.2010.11.061>
- Arun KM, Sandhya M, Imran K, Govind R (2016) Evaluation of oxidative stress and lipid profile in patients of generalized vitiligo. *International Journal of Medical Science and Public Health*, 5(03): 493-6. <https://doi.org/10.5455/ijmsph.2016.1008201590>
- Bulgakov AV, Babieva NS, Levanova EA, Gridyaeva LN, Erofeeva MA, Sokolovskaya IE, Davidyan LY (2018) Specific features of psycho-emotional states of working women during pregnancy. *Electronic Journal of General Medicine*, 15(6): em86. <https://doi.org/10.29333/ejgm/99829>

- Ece A, Tünay Z (2018) Successful management of acute bismuth intoxication complicated with acute renal failure, seizures and acute pancreatitis in a child. *J Clin Exp Invest.*, 9(3): 131-4. <https://doi.org/10.5799/jcei.458761>
- Hann SK, Nordlund JJ (2000) Definition of vitiligo. In: *Vitiligo: A Monograph of the Basic and Clinical Science*. Hann SK, Nordlund JJ (Eds.). Oxford: Blackwell Science Ltd: 3–5. <https://doi.org/10.1002/9780470760116>
- Ines D, Sonia B, Riadh BM, Amel el G, Slaheddine M, Hamida T, et al. (2006) A comparative study of oxidant-antioxidant status in stable and active vitiligo patients. *Arch Dermatol Res*, 298(4): 147–52. <https://doi.org/10.1007/s00403-006-0680-2>
- Kovacs SO (1998) Vitiligo. *J Am Acad Dermatol*, 38: 647-66. [https://doi.org/10.1016/S0190-9622\(98\)70194-X](https://doi.org/10.1016/S0190-9622(98)70194-X)
- Maresca V, Roccella M, Roccella F, Camera E, Del Porto G, Passi S, et al. (1997) Increased sensitivity to peroxidative agents as a possible pathogenic factor of melanocyte damage in vitiligo. *J Invest Dermatol*, 109: 310-3. <https://doi.org/10.1111/1523-1747.ep12335801>
- McArdle F, Rhodes LE, Parslew RAG, Close GL, Jack CIA, Friedmann PS, Jackson MJ (2004) Effects of oral vitamin E and β -carotene supplementation on ultraviolet radiation–induced oxidative stress in human skin. *Am J Clin Nutr*, 80: 1270-5. <https://doi.org/10.1093/ajcn/80.5.1270>
- Metta AK, Metta S, Kazmi I (2014) Evaluation of oxidative stress and lipid profile in patients of generalized vitiligo. *International Journal of Medical Science and Public Health*, 3(7).
- Nasiri M, Rezghi M, Minaei B (2014) Fuzzy dynamic tensor decomposition algorithm for recommender system. *UCT Journal of Research in Science, Engineering and Technology*, 2(2): 52-5.
- Ozougwu JC (2016) The Role of Reactive Oxygen Species and Antioxidants in Oxidative Stress. *International Journal of Research in Pharmacy and Biosciences*, 3(6): 1-8.
- Sravani PV (2009) Determination of oxidative stress in vitiligo by measuring superoxide dismutase and catalase levels in vitiliginous and non-vitiliginous skin. *J Dermatol Venereol Leprol*, 75: 268-71. <https://doi.org/10.4103/0378-6323.48427>
- Yılmaz S, Kaya E, Comakli S (2017) Vitamin E (α tocopherol) attenuates toxicity and oxidative stress induced by aflatoxin in rats. *Adv Clin Exp Med.*, 26(6): 907–17. <https://doi.org/10.17219/acem/66347>