# The relationship between glutathione used to treat facial pigmentation and some immune cells in the blood

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## Abstract:

Glutathione is one of the most important antioxidants manufactured by the body through the liver and neurons, has therapeutic uses in cases of nerve damage caused by the toxicity of a chemical treatment and also has an effect in the process of manufacturing melanin. It is found to inhibit melanin, which can contribute to skin bleaching and relieve pigmentation. The aims of this study to study the relationship between glutathione used to remove skin pigmentation and some immune cells in the blood in volunteer women and the relationship between the immune response of volunteer women to inject glutathione and age. A blood test was conducted in vitro for all volunteer women before and after injection to see what changes would occur to immune cell values. The relationship between glutathione and lymphocyte levels showed that glutathione does affect on lymphocyte levels, and P.value was (0.01), so there is clinical significance between glutathione and lymphocyte levels. The relationship between glutathione and Basophilis levels showed that glutathione does affect on Basophilis levels, and P.value was (0.569), so there is no  clinical significance between glutathione and Basophilis levels. The relationship between glutathione and Eosinophils levels showed that glutathione does affect on Eosinophils levels, and P.value was (0.017), so there is clinical significance between glutathione and Eosinophils levels. The relationship between glutathione and Neutrophils levels showed that glutathione does affect on Neutrophils levels, and P.value was (0.038), so there is clinical significance between glutathione and Neutrophils levels. The relationship between glutathione and monocyte levels showed that glutathione does affect on monocyte levels, and P.value was (0.011), so there is clinical significance between glutathione and monocyte levels. The most commonly used age group for treatment of facial pigmentation is aged 45 years and above by 49.37%, followed by the age group from 34 to 44 years by 38.70%, while the group that least used glutathione was from 23 to 33 years old and they accounted for 27.21 %. The result analyzed by the statistical test showed that the most  age  groups in which there was a change in lymphocytes was the first age group, which included ages from (23-33 years) by 41% followed by the second age group (34-44 years) by 33% and then the third age group (45-55 years) by 26%.

## Introduction

Glutathione is one of the antioxidants produced by the body through the liver and nerve cells [1],[2]. It consists of three amino acids, namely cysteine, glycine, and glutamate [3]. It has therapeutic uses in cases of nerve damage resulting from the toxicity of a chemical treatment, An effect of glutathione has been observed in the process of melanin production, as it has been shown to inhibit melanin production, which may contribute to whitening skin color and lightening pigmentation[4],[5],[6] and [7]. The history of the discovery of glutathione dates back to approximately 1888. Glutathione levels in the body reduced by a number of factors, including poor nutrition, environmental toxins, and stress[8]. Its levels also decline with age. In addition to being produced naturally by the body glutathione can be given intravenously, topically, or as an inhalant [9]. It's also available as an oral Glutathione is not only used to lighten the skin, but it has many other benefits such stimulating collagen production, Skin rejuvenation [10]. Reduce the effects of acne, Fight wrinkles and fine lines, Unify skin color [11], [12]. Glutathione (GSH) is an ubiquitous thiol-containing tripeptide that plays a key role in cell biology [13]. It modulates cell response to redox changes associated with the reactive oxygen species, detoxifies the metabolites of drugs; regulates gene expression and apop-tosis, and is involved in the transmembrane transport of organic solutes. Polymorphism has been observed in key enzymes of GSH metabolism and some alleles have been associated with an impaired redox buffer system down steam diseases, and susceptibility to ischemia [14], [15],[16] and [17]. These varied activities make GSH an attractive target for a more reductionist approach to the prevention and management of many conditions of interest to surgeons [18]. The good food sources of glutathione include: Broccoli, Cauliflower, Cabbage, Onion and garlic, Asparagus, Potatoes, Peppers, Carrots, Avocado, Squash, Spinach and Melon [19], [27]. The oxidant-antioxidant balance is an important determinant of immune cell function, including maintaining the integrity and functionality of membrane lipids, cellular proteins, and nucleic acids and controlling signal transduction and gene expression in immune cells [20], [21] and [26]. Optimal amounts of antioxidants however are needed for maintenance of the immune response for all age groups. This need might be more critical,, in aged persons [22], [23] and [24]. Using glutathione incorrectly may lead to major problems that cannot be controlled later, so studies must conducted on is importance and what is the risk on the body then determine the dose to be taken or injected. The aim of this study to study the relationship between the glutathione used to remove skin pigmentation and some immune cells in volunteers women and study of Relationship between the some immune response and the age in volunteers women.

## Materials and Methods

### *Place and period of Study*

This study was conducted in the laboratory of the Department of Pharmacy at the Higher Institute of Medical Sciences and Technologies / Abusalim, under the supervision of a specialized dermatologist and cosmetic medicine who obtained a Bachelor of Medicine from the Faculty of Medicine / University of Tripoli and permission to practice the profession and courses approved by the Ministry of Labor and an academic supervisor in the department and the study done for a period of five weeks.

### *Study population*

The study conducted on fourty volunteers of female sex, married and unmarried with different pigmentation from severe pigmentation in a high to light ratio.

### *Materials*

gloves, masks, medical cotton, hand sanitizen, medical alcohol, injection needles(10ml,bd u-100 insulin), local anesthesia, white blood samples tubes, glutathione ( 5m e 0.169 -no 2 05/20 - made in Spain).

### *Study tool*

A blood sample of the size (5ml) was withdrawn for each donor woman and a white blood cell examination was carried out to ascertain the normal rate of donor cases for study and compare the results of the pre-injection and post-injection analysis. after signing each case on a pledge of consent and satisfaction and conducting a questionnaire that includes all the important information for all volunteers of the study, and the content of the questionnaire was clarified. The study included different ages from 23 to 55 years and for a period of five weeks, where cases were injected at a rate of (1 ml) of glutathione under the skin in each session at a rate of five sessions ranging from one week to ten days, depending on the severity of pigmentation and the response of cases. After the injection of the glutathione dose, a blood sample of the size (5ml) was drawn for each volunteer and a blood sample examination was performed in the laboratory of the Green Hospital in Tripoli then compared with the results of the analysis before and after the injection.

### Data management and statistical analysis

The collected data were sorted, coded, then entered and analyzed using SPSS, version 25.0. Quantitative data were expressed as numbers and percentages. We would compare the percentage before and after the injection. The parametric statistical test called paired t_test used to determine whether there was a difference between the two paired samples. A p value of less than 0.05 was considered statistically significant.

## Results:

### Demographic characteristic of participants

A total of 40 female volunteers participated in the study in the laboratory of the Department of Pharmacy at the Higher Institute of Medical Sciences and Technologies / Abusalim.

### Immune cell values

A blood test was conducted invitro for all volunteer Women before and after injection to see what changes would occur to immune cell values, Basophilis variable, Eosinophil variable, Monocyte variable, Neutrophil variable and the Lymphocyte variable as in fiqure 1. That shows increased for Eosinophils and Neutrophils by 15.40% and for Monocyte by 38.50% and for Lymphocyte by 69.23% as shown in fiqure 1.

### Age of volunteering woman in this study

The study included different ages from 23 to 55 years for a period of five weeks, where cases were injected at a rate of (1 ml) of glutathione under the skin in each session at a rate of five sessions ranging from one week to ten days, depending on the severity of pigmentation and the response of volunteers, the comparison of the age groups most commonly used glutathione in female volunteers. The age groups that most used glutathione were aged 45 years and above by 49.37%, followed by the age group from 34 to 44 years by 38.70%, while the group that least used glutathione was from 23 to 33 years old and they accounted for 27.21 % of the total women volunteering for this study as shown on fiqure 2.
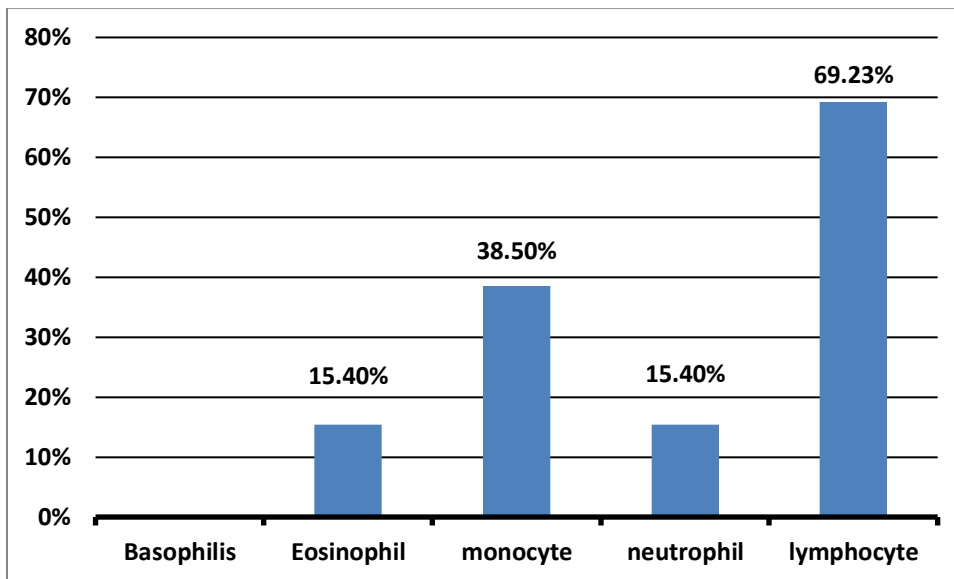
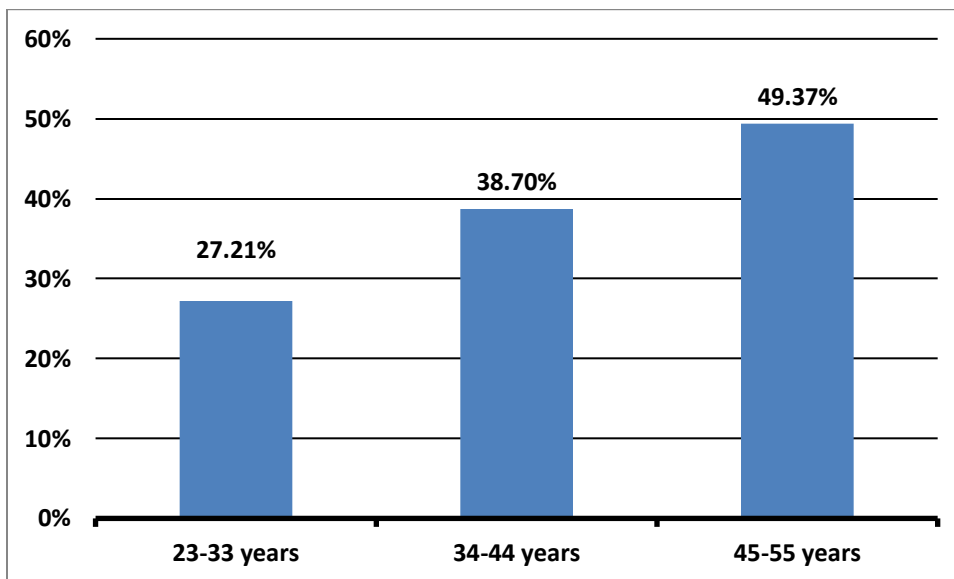**Figure 1:** The percentage of people whose rates increased after injection according to each variable.



**Figure 2:** Distribution of volunteers according to age group.

***The immune response for lymphocytes according to age groups***

The result analyzed by the statistical test showed that the most  age  groups in which there was a change in lymphocytes was the first age group, which included ages from (23-33 years) by

41% followed by the second age group (34-44 years) by 33% and then the third age group (45-55 years) by 26% as shown in fiqure 3.
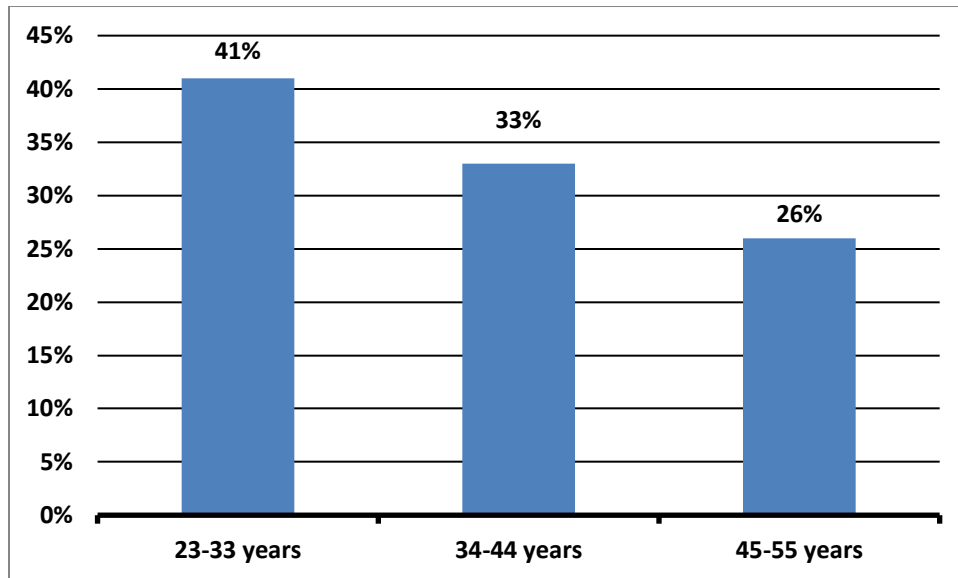


**Figure 3:** The immune response for lymphocytes according to age groups.

## DISSCUSION

The relationship between glutathione and lymphocyte levels showed that glutathione does affect on lymphocyte levels, and P.value was (0.01)so there is clinical significance between glutathione and lymphocyte levels. The relationship between glutathione and Basophilis levels showed that glutathione does affect on Basophilis levels, and P.value was (0.569), so there is no clinical significance between glutathione and Basophilis levels. The relationship between glutathione and Eosinophils levels showed that glutathione does affect on Eosinophils levels, and P.value was (0.017), so there is clinical significance between glutathione and Eosinophils levels. The relationship between glutathione and Neutrophils levels showed that glutathione does affect on Neutrophils levels, and P.value was (0.038), so there is clinical significance between glutathione and Neutrophils levels. The relationship between glutathione and monocyte levels showed that glutathione does affect on monocyte levels, and P.value was (0.011), so there is clinical significance between glutathione and monocyte levels. The most commonly used age group for treatment of facial pigmentation is aged 45 years and above by 49.37%, followed by the age group from 34 to 44 years by 38.70%, while the group that least used glutathione was from 23 to 33 years old and they accounted for 27.21 %. The result analyzed by the statistical test showed that the most age groups in which there was a change in lymphocytes was the first age group, which included ages from (23-33 years) by 41%

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## CONCLUSION

There is a little convincing evidence in favor of glutathione as a therapy for hyperpigmentation at the present time, and there are many unresolved controversies that surround its use [26]. The trials available to date that have evaluated the role of glutathione in skin lightening administered through different modes have numerous limitations. Although the safety of topical and oral glutathione (GSH) seems to be good, their efficacy (especially long-term) remains questionable [25]. The extant evidence to support or discourage use of intravenous injection of glutathione (IV GSH injection) as a therapeutic modality for improving skin tone or pigmentation is minimal and contradictory; notwithstanding the austere concern regarding the potential adverse effects associated with this mode of administration. More evidence in the form of high quality trials with better study design, larger sample size, and long-term follow-up is vital, before our patients are subjected to glutathione-based treatments [23].

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