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# The Consumption Effect of Garlic Tablet on Proteins Oxidation Biomarker (SH-group) in Postmenopausal Osteoporotic Women

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## ABSTRACT

Osteoporosis is one of the most prevalent metabolic bone diseases which is a main cause of death in developed and under developing countries in addition to disabilities and is more prevalent in higher ages especially in menopause women. The recent biochemical and genetic studies indicate that an increase in oxidative stress results in reduction of bone density. In this research, 40 women suffering from osteoporosis were randomly divided into two Garlic (GG) and placebo groups (PG) and the SH-group was measured using the *Kitajima's* method. We observed a significant ( $P=0.001$ ) increased level SH-group of after taking Garlic tablets in PG in comparison to before taking Garlic tablets in PG. increased level plasma SH-group in after taking Garlic tablets in GG in comparison to before taking Garlic tablets in GG ( $P=0.002$ ). The garlic intake can effect on oxidation of SH- group. The mentioned phenomenon may stem from Diallyl-sulphide and Diallyl-disulphide, which increase the antioxidant activity.

**Key words:** Proteins Oxidation, SH-group, Osteoporotic, Garlic

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## 1. INTRODUCTION

Osteoporosis is one of the most prevalent metabolic bone diseases which is a main health problem in developed and under developing countries. It is known as the latent epidemic of the modern world. The world health organization has ranked the osteoporosis as the 4th main threats after the cancer, heart attack, and stroke (1, 2). The Osteoporosis prevalence is 6% among the women higher 50 and is about 30-50 % in men higher 50 suffer from a level of Osteoporosis like osteopenia (3). About 2.5 millions of menopause women suffer from Osteoporosis in Iran (4). The bone density decrease starts from 35-40 in both sexes while it is intensified in women after menopause (5). The menopause and losing the steroid hormones which results in increase in bone recycle and decrease in bone density consequently is the main cause of

Osteoporosis in women (6). There are lot of studies which indicate that an increase in oxidative stress results in reduction of bone density (7). The ROS and oxygen free radicals play an important role in incidence of many diseases like Osteoporosis. High amount of ROS results in oxidative stress, which may damage the cells and prevent the calcium absorption leading to Osteoporosis. The oxidative stress occurs when the antioxidant system is not able to overcome the ROS. An increase in free radicals may cause the oxidative stress (8). There is a special system in body to fight the damages of free radicals called the antioxidant immune system (9). The estrogen and other chemical drug intake to treat osteoporosis in menopause women have side effects. The garlic has the lignin having phytoestrogen property which absorbs the calcium and

diminish the estrogen effect on bone (10). The garlic has been supposed to have anti osteoporotic effect in recent studies and its effects have been studied in preventing the biomarkers due to estrogen shortage, bone decrease, and alkaline phosphatase (11). Diallyl-sulphide (DAS) and Diallyl-sulphide (DADS) are two main ingredient in garlic and their consumption may increase the activity of antioxidant cells preventing the free radicals damage. The old garlic essence has the most antioxidant property among garlic products (11) since the DADS of garlic acts as a more effective agent against ROS in smokers to protect against osteoblasts playing an important role in osteoporosis. The purpose of this study was to investigate the effect of garlic tablet on protein oxidation.

## 2. MATERIALS AND METHODS

In this study, we sample 40 postmenopausal women, which are divided into two groups. This study was carried out in 6 months (December – may). The inclusion criteria were: lack of sensitivity to garlic, not using drugs such as aspirin, hyperlipidemia and gastrointestinal ulcers, captopril and lipid lowering and anticoagulant drugs, lack of heart disease, an age range of 45 to 65 years, hypertension and bone density in the areas of lumbar spine or femur less than 2 , -5 gr/cm<sup>2</sup>. Exclusion criteria were; sensitivity to

Table 1). We observed a significant (P=0.001) increased level SH-group after taking Garlic tablets in PG in comparison to before taking Garlic tablets in PG (Chart 1) (

Table 2 ). increased level plasma SH- group in after taking Garlic tablets in GG in comparison to before taking Garlic tablets in GG (P=0.002) (Chart 1) (

Table 2 ). The study shows that oxidative stress markers in postmenopausal women with osteoporosis in postmenopausal status occur. (13). Increased oxidative stress increases with aging, osteoporosis and looks.(14) Oxidative stress is an important indicator of osteoporosis in postmenopausal women (15). Also Measuring SH –

garlic and patient dissatisfaction. 40 postmenopausal women with osteoporosis who were randomly divided into two groups: 20 patients in the placebo group (PG) and 20 patients in the garlic intervention group (GG) have investigated for 1 month. Before and after the intervention 5cc blood Venous obtained from patients after centrifugation (3000 rpm min to 5 min), plasma samples were frozen at -70 store. Kitajima's method is to measure the SH-group (12). This represents a revival of Thiol groups, which can cause a yellow complex 5, 5'-dithiobis 2-nitrobenzoic acid (DTNB) is measurable wavelength of 421 nm. plasma 100 µm, PBS PH=8 2800 µm , and 5, 5'-dithiobis 2-nitrobenzoic acid (DTNB) 300 µm mixed, and incubated for 15 min at room temperature, OD is measured at 412 nm. Measurements were done with a spectrophotometer Model EPOCH-Bio Tek. Results are expressed as mean ± SD. Statistical significance was achieved if P.Values were less than 0.05. All the statistical analysis was performed using the SPSS (version 15) independent – samples T. Test.

$$SH\text{- group} = OD/13600 * 10^6$$

## 3. RESULTS AND DISCUSSION

**Baseline Characteristics of Studied Groups.** ( group shows reflecting increased free radicals (13). Further evaluation of oxidative stress markers and bone density with osteoporosis medications will lead to better understanding of the role of free radicals and antioxidants in the regulation of bone mass (16). Use of garlic can reduce the effects of increased protein oxidation (17). We can conclude that the effect of garlic on lipids, stress oxidative and blood pressure extends also to platelet function (18). Short-term supplementation of garlic in human subjects has demonstrated an increased resistance of LDL to stress oxidative and oxidation (19). According to a study we conducted by the use of garlic and medicines, with an increase of garlic oxidative stress that played an important role in osteoporosis in menopausal women, prevention. According to this study and previous studies, we concluded that Garlic can reduce oxidative stress and damage and help to prevent this.

Table 1. Baseline Characteristic of Studied Groups

Characteristics	GG (N = 20)	PG (N = 22)	P-value
Age (year)	5.81± 56.10	5.84±57.27	0.51
Age of menarche (year)	0.94 ± 13.55	1.39± 13.68	0.72
Age of menopause (year)	4.40± 48.55	5.38± 48.22	0.83
BMI(kg/m2)	2.85 ±27.27	2.93± 27.59	0.51
BMD in lumbar spine (g/cm2)	0.6± -3.28	0.83±-3.28	0.98
BMD in neck femur (g/cm2)	0.9± -1.91	0.83 ±-3.28	0.91

Table 2 . Comparison of mean of SH-group in two study groups

	mean±SD Placebo group	mean±SD Garlic group	P-value
Before(n=20)	132.31 ± 5.82	81.37 ± 10.71	0.002
After(n=20)	144.28 ± 12.73	133.78 ± 15.19	0.001

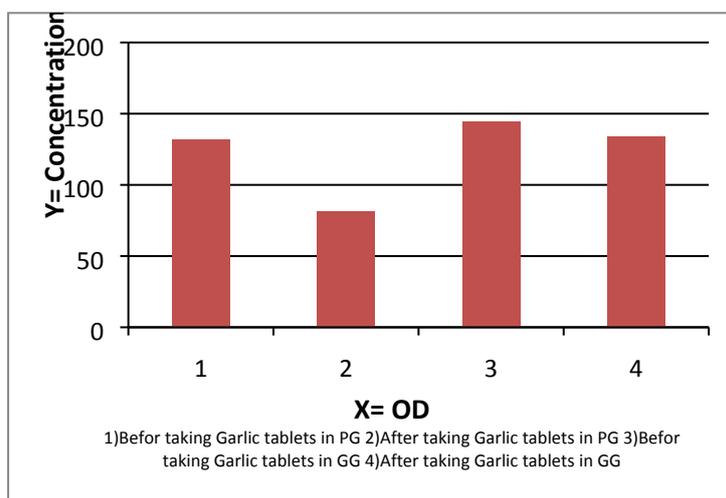


Chart 1. SH- group oxidation in the study

#### 4. CONCLUSION

In this study, antioxidant properties are proven to track and the antioxidants can prevent osteoporosis; so with proper planning and the use of medicines and garlic powder in the regime of osteoporosis food will help in prevention of the necessary.

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#### AUTHORS CONTRIBUTION

This work was carried out in collaboration between all authors.

#### CONFLICT OF INTEREST

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

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