

Comparison of Bone Mineral Density among Alcoholism and Nonalcoholism Athlete and Nonathlete Subjects

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ABSTRACT

Background: The aim of this study was to compare bone mineral density among alcoholic, nonalcoholic and nonathlete subjects.

Materials and methods: The group consisted of physically active people. A questionnaire was given to both alcoholics and nonalcoholics and 28 persons were randomly selected (15 members who consumed alcohol and 13 who did not). In order to collect the data on mineral aggregation, a testing device (DEXA) was used. The data were analyzed using SPSS software.

Results: It was found that higher bone aggregation in each of the two athletic group in comparison with the nonathletic group ($p < 0.05$).

Conclusion: Exercise may have a positive impact on bone mineral density.

Abbreviations: BMD: bone mineral density; SPSS: Statistical package for social science.

Keywords: Bone mineral density, Alcoholism, Nonalcoholism, Athlete, Nonathlete.

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INTRODUCTION

Osteoporosis is one of the most common health problems in the world and this occurs in the form of bone fractures that progresses with ages.¹ Osteoporosis may induce anomaly in the neurotic system and advances slowly and without any notable symptom.² Therefore, no curative therapy has been found for this clinical problem. Only with exercise, good nutrition and consumption of calcium, the risks of osteoporosis can be reduced.³⁻⁵ Additional factors related to progression of osteoporosis are age and gender.⁶ Sports have been indicated as one of the most important and effective means in the prevention of osteoporosis.⁷ Exercise not only preserves but also stimulates bone formation while reducing osteoporosis risks such as mineral aggregation. It also strengthens equilibrium of muscles and thereby reduces breakage risks significantly.⁸ Micklesfield et al⁹ have reported that bone bulk aggregation is three times more in people who exercise than in individuals who do not

exercise. Lawson et al¹⁰ have indicated that bone aggregation is found more in girl students than others. Similar results have been seen in soccer players,¹¹⁻¹³ weight lifters,¹⁴ and tennis players.¹⁵ Investigators agree that correct lifestyle is one of the factors necessary for good health and results in accession or prevention of osteoporosis especially for older age groups.¹⁶ With the exception of sports, other factors also have an important role in lifestyle-related diseases. Investigators have shown negative effects of alcohol consumption. Spencer et al¹⁷ have reported that alcohol consumption causes a significant bone reduction in people aged between 31 and 47 years. Williams et al¹⁸ have also indicated that there is an increase in bone aggregation in individuals who have a history of alcohol consumption. Taken together, a panel of national institutes has paid attention and has indicated that alcoholism is one of the causes of osteoporosis. However, these findings need to be optimized by further investigations in different part of the world.¹⁹

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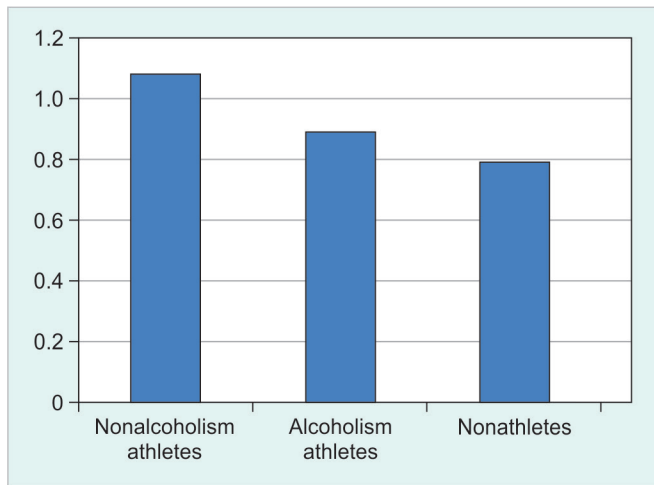


Fig. 1: The bone aggregation in each of the three groups is shown (g/cm²)

MATERIALS AND METHODS

The study was conducted on athletic and nonathletic men (aged 45-50 years). The group consisted of physically active people. A questionnaire was given to both alcoholics and nonalcoholics and 28 persons were randomly selected (15 consuming alcohol and the rest 13 with no history of alcohol intake). In order to collect the data on mineral aggregation, a testing device (DEXA) was used along with a questionnaire on the past sport activity of the participants, recording their history of alcohol consumption along with a premedical history of the individual. The American System²⁰ considered as one of the most precise and reliable method was used to find the bone mineral aggregation rate in the leg. This test was conducted at the Khozestan osteoporosis testing center by radiology experts. The resulting data were analyzed using used SPSS software.

RESULTS

The bone aggregation test of the three groups is shown in Figure 1. The results show that the nonalcoholism athlete group without alcohol consumption showed significant higher bone aggregation compared with two other groups (alcoholism athlete and nonathlete subjects). In addition, the Chase-Chace effect or the result of least significant difference test showed that the athletic group who consumed alcohol to have high bone aggregation in proportion to the nonathletic group.

DISCUSSION

It appears that sports may have caused a mechanical effect that may induce increased mineral aggregation in the bones. Therefore, continued sports activity is of great importance especially in advanced ages. Nevertheless, it was shown that athletics who consumed alcohol had low bone aggregation

when compared with athletes of nonalcoholic group. Wosje and Kalk Warf²¹ reported that women and men above the age of 20 who consumed greater amounts alcohol had more bone aggregation. In addition, investigators have also reported increase in the risk of astopeny with the increase in consumption of alcoholic drinks. This study also showed a negative effect of alcohol consumption on bone mineral density.

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REFERENCES

1. Committee on Gynecologic Practice, American College of Obstetricians and Gynecologists. ACOG Committee opinion #270. Bone density screening for osteoporosis. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2002 Mar;99(3):523-525.
2. Reginster JY, Burlet N. Osteoporosis: A still increasing prevalence. *Bone* 2006 Feb;38(2 Suppl 1):S4-S9.
3. Blalock SJ, Currey SS, DeVellis RF, DeVellis BM, Giorgino KB, Anderson JJ, Dooley MA, Gold DT. Effects of educational materials concerning osteoporosis on women's knowledge, beliefs, and behavior. *Am J Health Promot* 2000 Jan-Feb;14(3):161-169.
4. Griffiths F, Convery B. Women's use of hormone replacement therapy for relief of menopausal symptoms, for prevention of osteoporosis, and after hysterectomy. *Br J Gen Pract* 1995 Jul;45(396):355-358.
5. Hatami M. The effects of self protection training programs on level of knowledge and practice of student girls to prevent of osteoporosis in geriatrics. 1381:89-96 .
6. Greene DA, Naughton GA. Adaptive skeletal responses to mechanical loading during adolescence. *Sports Med*. 2006;36(9):723-732.
7. Barry DW, Kohrt WM. Exercise and the preservation of bone health. *J Cardiopulm Rehabil Prev* 2008 May-Jun;28(3):153-162.
8. Borer KT. Physical activity in the prevention and amelioration of osteoporosis in women: interaction of mechanical, hormonal and dietary factors. *Sports Med* 2005; 35:779-830.
9. Micklesfield LK, van der Merwe L, Lambert EV. Lifestyle questionnaire to evaluate risk factor for reduced bone mineral density in women. *Clin J Sport Med* 2005 Sep;15(5):340-348.
10. Lawson M., Nichols J, Barkari HS. Influence of sport on bone mineral density of female high school athletes. *Am Col Spor Med* 2004;36(5):37.
11. Uzunca K, Birtane M, Durmus-Altun G, Ustun F. High bone mineral density in loaded skeletal regions of former professional football (soccer) players: what is the effect of time after career? *Br J Sports Med* 2005 Mar;39(3):154-158.
12. Nazarian AB, Khayambashi K, Rahnama N, Salamat MR. Comparison of bone mineral density in lumbar spines and femoral bone between professional soccer players and non-athlete subjects. *World J Spor Sci* 2009;2(1):106-111.
13. Muñoz MT, de la Piedra C, Barrios V, Garrido G, Argente J. Changes in bone density and bone markers in rhythmic gymnasts

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- and ballet dancers: implications for puberty and leptin levels. *Eur J Endocrinol* 2004 Oct;151(4):491-496.
14. Karlsson MK, Johnell O, Obrant KJ. Bone mineral density in weight lifters. *Calcif Tissue Int* 1993 Mar;52(3):212-215.
 15. Haapasalo H, Sievanen H, Kannus P, Heinonen A, Oja P, Vuori I. Dimensions and estimated mechanical characteristics of the humerus after long-term tennis loading. *J Bone Miner Res* 1996 Jun;11(6):864-872.
 16. Spear HJ, Kulbok PA. Adolescent health behaviors and related factors: a review. *Public Health Nurs* 2001 Mar-Apr;18(2):82-93.
 17. Spencer H, Rubio N, Rubio E, Indreika M, Seitam A. Chronic alcoholism. Frequently overlooked cause of osteoporosis in men. *Am J Med* 1986 Mar;80(3):393-397.
 18. Williams FM, Cherkas LF, Spector TD, MacGregor AJ. The effect of moderate alcohol consumption on bone mineral density: a study of female twins. *Ann Rheum Dis* 2005 Feb;64(2):309-310.
 19. Berg KM, Kunins HV, Jackson JL, Nahvi S, Chaudhry A, Harris KA Jr, Malik R, Arnsten JH. Association between alcohol consumption and both osteoporotic fracture and bone density. *Am J Med* 2008 May;121(5):406-418.
 20. NIH Consensus Development Panel on Osteoporosis Prevention, Diagnosis, and Therapy. Osteoporosis prevention, diagnosis, and therapy. *JAMA* 2001 Feb 14;285(6):785-795.
 21. Wosje KS, Kalkwarf HJ. Bone density in relation to alcohol intake among men and women in the United States. *Osteoporos Int* 2007 Mar;18(3):391-400.