



Sebbar El-Houcine^{1-3*}, Saalaoui Ennouamane¹ and Choukri Mohammed¹⁻³

¹Laboratory of Biochemistry and Biotechnology, Faculty of Sciences of Oujda, Mohammed First University, Oujda, Morocco

²Faculty of Medicine and Pharmacy of Oujda, Mohammed First University, Oujda, Morocco

³Central Laboratory, the Mohammed VI University Hospital, Oujda, Morocco

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***Corresponding author:** Sebbar El-houcine, Laboratory of Biochemistry and Biotechnology, Faculty of Sciences of Oujda, Mohammed First University, Oujda, Morocco, Tel: 0021272433207; E-mail: e.sebbar@ump.ac.ma

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Research Article

Calcium intake in the Moroccan menopausal women

Abstract

Introduction: Osteoporosis is a major public health problem. Most epidemiological studies show that calcium deficiency is common in the menopausal women. The aim of our work is to evaluate the calcium intake in the Moroccan menopausal women.

Methods: The version translated into Arabic dialect Fardellone questionnaire is tested on a sample of 209 menopausal women.

Results: The mean calcium intake was 4165 mg by week (595 mg/day). The assessment of calcium intake showed a deficiency, and the average consumption of calcium per day is significantly lower than the recommended daily amount for this population.

Conclusion: Evaluation of the calcium intake is an essential tool for better management of metabolic bone diseases. The conservation of a food rich in calcium is important at any age; in its absence, a medicinal supplementation in calcium becomes useful.

Introduction

Osteoporosis is a major public health problem due to its ever-increasing incidence and the impact of osteoporotic fractures. Fractures are associated with increased mortality and often lead to significant morbidity, affecting the quality of life. This increase is particularly due to the increase and aging of the population. The most important cause of osteoporosis is bone loss which occurs primarily in women after menopause [1]. The principal goal in managing postmenopausal osteoporosis is the prevention of future fractures. Therefore, identifying women at the highest risk is a clinical priority, and a total calcium intake of 1000 to 1500 mg per day and a total vitamin D intake of 600 to 800 IU per day are recommended [2]. We performed this work in order to evaluate the calcium ration of the Moroccan menopausal women.

Methods

This study included 209 women aged over 50 years who confirmed that they were menopausal (Amenorrhoea for at least one year), to describe the calcium ration in the Moroccan menopausal women. The inclusion criteria were: Moroccan women and whose residence was in Morocco, aged 50 years and older with consistent menopause, and who consented to participate in the study. The different social classes are included in the study. The exclusion criteria were: Non-Moroccan women or resident outside Morocco, women aged less than 50

or non-menopausal, and any woman who refused to participate in the study and who had communication difficulties.

The calcium ration is evaluated using the translated version in dialectal Arabic of the Fardellone questionnaire [3]. The questionnaire consists of 22 items whose calcium content is evaluated by the Fardellone equivalence tables [3]. These foods have been grouped into one of the following five classes: Calcium in the form of milk (Pure milk, Milk drinks, etc.) ; Calcium in the form of dairy and cheese (Yoghurt, petit Suisse, white cheese, baked cheese, soft cheese, etc.) ; Calcium in the form of vegetables, fruits, meats and mineral waters (VFMW) (Note that Moroccan mineral waters are not very rich in calcium [4]; Calcium in the form of breads, meal or pasta (BMP) And calcium in the form of chocolate. The calcium intake in drug form were not included in the calculation of calcium intake. The time required to complete the questionnaire was 15 to 20 minutes. The investigation lasted three months (March, April, and May 2017). The statistical analysis was carried out using the software Epi-info in version 7.2. The questionnaire was completed after having the informed consent of the participants, informed in advance about the purpose of our work and the conditions of the proceedings and strictly anonymous.

Results

Our series included 209 menopausal. The average age is 56.67 ±12.31 and a mean body mass index (BMI) of 28.4 ±4.2

kg/m², 73% of female participants are overweight and 11% are obese. The distribution of the population studied according to social class shows that 36% of subjects had low socio-economic level, 57% had medium socio-economic level, and 7% had high socio-economic level. The mean total calcium consumption of the subjects recruited is 4165 mg per week, a daily consumption of 595 mg per day. The distribution of the different percentages of the calcium intake showed: 9.8% of subjects had a “low” calcium intake (less than 500 mg per day); 88% of subjects had a “poor” calcium intake (between 500 and 999 mg per day) and 2.2% had a “sufficient” calcium intake (between 1000 and 1499 mg per day). For the age groups 50–60 years, 60–70 years, and >70 years, the daily intakes of calcium were respectively 624, 592 and 525 mg per day (Table 1).

The assessment of calcium intake by weekly calcium intake distributed according to food groups showed a deficiency in this population. The results are detailed in table 1. The calcium deficiency is explained by a decreased contribution of chocolate (3% of the total calcium intake) followed by the BPS group (14.8% of the total calcium intake) and cheese dairy (18.7% of the total calcium intake). The distribution according to the different food groups shows that the calcium intake of milk and milk products represents 35% of the total calcium intake (Table 2). The study of the associations of daily calcium intake were not significant with BMI ($p=0.1$) and different social classes ($p=0.4$).

Discussion

The aim of our study is to quantify the calcium intake of the Moroccan menopausal women and to compare these results with the recommended intakes. This type of survey of calcium ration is easy to carry out, especially with the current choice of frequency questionnaires. The Fardellone questionnaire used for our study has the advantage of being adapted to the Moroccan food culture. Evaluating a weekly frequency, it takes into account intra-individual food variations and consumption

throughout the week without excluding weekend meals. The evaluation of calcium ration in postmenopausal women is interesting due to the involvement of calcium deficiency in the defect of bone mineralization predisposing to osteoporosis. We have shown a lack of calcium intake affecting the Moroccan menopausal women. In Morocco, a similar study carried out in 2010 for evaluating the calcium ration in population of Marrakesh and its region [5], which shows results similar to the results of our study, which can be explained by the similarity of food habits in different regions of Morocco. Another Moroccan study carried out in Casablanca, including 130 postmenopausal women, estimated the average calcium intake by the Fardellone questionnaire at 448.38 mg per day [6]. In the same survey, considering food groups, the distribution of calcium consumption shows that nearly 58% of the calcium in food is supplied by non-dairy foods (vegetables, breads, meats, water, etc.) compared to 4.7% for milk and 37.4% for dairy and cheese. Eighty-five point thirty-eight percent of subjects have a “low” calcium intake (less than 500 mg per day); 11.53% of subjects had a “poor” calcium intake (between 500 and 999 mg per day) and 3.09% had a “sufficient” calcium intake (between 1000 and 1499 mg per day) [6]. Evaluation of the calcium ration of Tunisian women by the Fardellone questionnaire found a low average calcium intake estimated at 427 ± 160 mg per day. The calcium intake was greater than 800 mg per day in only 4% of postmenopausal women and 1200 mg per day in 0.2% of menopausal women. Dairy products provided only 34.5% of this diet [7]. Thus, it can be seen that the calcium consumption of women in Morocco is close to consumption as well as in Tunisia, suggesting the implication of the Maghreb diet based mainly on bread and Meat in this deficiency. The data from the literature are very poor regarding the evaluation of calcium intake in the Maghreb (Morocco, Algeria, Tunisia, Libya, Mauritania), only a few Tunisian studies [7–9], that are consistent with the results of our study, and confirm the insufficiency of calcium intake in Tunisian menopausal women. And we note the absence of similar studies in other Maghreb countries such as Algeria, Libya and Mauritania which makes it difficult to evaluate the intake in menopausal women of the Maghreb. This consumption is still lower than that reported by some surveys carried out in other studies [10–15] (Table 3). The deficiency of calcium intake is often associated with vitamin D deficiency. This situation is frequent in the Maghreb countries despite the sunshine [16–18], which suggests a high incidence of bone metabolic pathology. Adequate calcium and

Table 1: The characteristics of the study population, and the distribution of calcium intakes by age group.

	number of subjects	BMI	Average calcium intake in mg / day	Less than 500 mg per day	Between 500 and 999 mg per day	Between 1000 and 1499 mg per day
Study population	209	28.4	595	9.8%	88%	2.2%
50-60	135	28.7	624	9%	88%	3%
60-70	65	28.2	592	9%	90%	1%
>70	9	27.8	525	44.44%	55.55%	0%

Table 2: Weekly calcium intake distributed according to food groups.

Food Groups	Average calcium intake in mg / week	Average calcium intake in mg / day
Milk	1478 (35%)	211
Dairy + cheese	1160 (27.8%)	165
Vegetables + fruits + meat + water	780 (18.7%)	112
Bread + pasta + semolina	620 (14.8%)	89
Chocolate	127 (3%)	18
Total	Total 4165	Total 595

Table 3: Comparison of calcium intake for different series.

Publications	Calcium intake in mg / day
Ait Ouazar et al. [24]	603
Bennouna et al. [7]	448.38
Laatar et al. [8]	427 ± 160
Boonau et al. [9]	652
Hercberg et al. [10]	800
Chapuy et al. [11]	659
Scaccini et al. [12]	600
Angus et al. [13]	809
Zvonimir et al. [14]	901.8
Our Series	595

vitamin D supplementation is key to ensuring prevention of progressive bone loss. For postmenopausal women a total daily intake of 1200 mg of elemental calcium from dietary and supplemental sources and daily supplementation with 800 to 2000 IU of vitamin D are recommended. Calcium and vitamin D supplementation alone is insufficient to prevent fracture in those with osteoporosis; however, it is an important adjunct to pharmacologic intervention with antiresorptive and anabolic therapy [19].

There are many limitations in our study design. The study was observatory in its nature. The results may be biased by the selection of participants who consented to the study and contacted the interviewers, women participants may be more aware of their health needs, compared to women who did not agree to participate. This disparity may have led to an underestimation of the actual level of calcium deficiency in Moroccan menopausal women. In addition, the results of the study are based on the patient's self-assessment, which is subject to the influence of memory and other subjective factors.

Conclusion

Our survey shows the frequency of deficiency in intake of calcium affecting the Moroccan menopausal women. The frequency of calcium deficiency requires the execution of a plan including calcium supplementation for this population. The conservation of a food rich in calcium is important at any age, and prevention involves raising public awareness of the implications of this deficiency and the risk factors.

Ethical Standards Statement

Our study has been approved by the appropriate ethics committee and has therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

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