



Food Sources and Bioavailability of Calcium

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Abstract

The identification of the calcium ration by self-questionnaires validated in the region of Blida and the Wilayas of approximately is one of the rare studies in Algeria. She was interested in a part of the Algerian population with characteristics that do not seem very different from the general population; however, this dietary survey must be supplemented by a study on a representative sample of the general population. The study showed insufficient calcium intake mainly secondary to low consumption of milk and dairy products. This low calcium intake was objectified by the two questioning methods (Fardellone and CERIN), however, it will be desirable to establish Algerian self-questionnaires validated and verified by our learned society. The results obtained are worrying, which obliges us to immediately introduce a prevention and control strategy against the multiple pathologies linked to this low calcium intake, the main one being osteoporosis with its serious fracture complications.

Keywords: Calcium; Milk ; Oxalic Acid; Self-Questionnaire ; Bioavailability

Introduction

The role of calcium in nutritional balance and its importance in the proper functioning of the

body are widely accepted [1]. Calcium is very common in the diet, however it is milk and its derivatives that exhibit optimal bioavailability [2]. The interest of studying the factors influencing this bioavailability is capital for better management of dietary advice to cover calcium needs; calcium absorption depending on the source of calcium and the nature of the diet [3,4]. Our study aims to define the dietary sources of calcium, the factors influencing the absorbability and its bioavailability in order to adapt the diets to calcium needs.

Patients and Methods

100 volunteers of both sexes aged between 20 and 60 years, from the regions of central Algeria (Médéa, Chlef and Ain Defla) participated in the cross-sectional study for 3 months in 2021.

Inclusion Criteria

a) Healthy subjects, without specific and active medical or surgical history.

Non-Inclusion Criteria

a) subjects with, in particular, a digestive pathology with repercussions on the absorption of calcium

- b) subjects with an endocrine (goiter) or metabolic disorder (diabetes, obesity)
- c) pregnant or breastfeeding women
- d) subjects under calcium supplementation

The survey carried out is based on a validated frequency self-questionnaire (Fardellone) as a model for questioning the main dietary sources of calcium, the level of daily calcium intake and factors reducing its bioavailability. This frequency self-questionnaire comprises 20 items whose calcium content is assessed using Fardellone equivalence tables; each item is associated with a multiplying coefficient making it possible to obtain a result in mg / day.

Foods are divided into 6 groups

- a) Dairy products group
- b) Group of cereals, starches and pulses
- c) Group of meats, fish and eggs
- d) Confectionery group and particularly chocolate factories
- e) Group of drinks (water, fruit juice, coffee and tea)

The descriptive analysis of the population is based on the calculation of means and standard deviations for quantitative

variables and percentages for those which are qualitative. Data entry and statistical analysis are performed using SPSS4 statistical software.

Results

The study workforce was 60% women and 40% men. Subjects over 60 years of age represented 60% of the total population. The work revealed an insufficient calcium intake (calcium intake of 659, 12 mg / d in men and 736.62 mg / d) essentially linked to a low consumption of milk and dairy products and a high consumption of foods containing oxalic acid: beetroot, spinach, coffee and tea in 96% of the study population.

Discussion

The population who participated in the study is predominantly female (60%) and relatively young (71% of the subjects surveyed had an average age of 28.71 years). We have adopted the WHO references for daily consumption levels, i.e.: low intake level for consumption <500 mg / d, mediocre intake level for calcium inputs of 500-999 mg / d and a suitable level for an intake > 1000 mg / d [4]. Based on the Fardellone frequency self-questionnaire, easily performed, reliable and adapted to our eating habits, the low absorbability of calcium has been associated with the current consumption of products rich in oxalic acid (contained in beets, spinach, tea and coffee) which affects the digestive relay of calcium bioavailability [5]. Overall, our results are similar to those obtained in Morocco [6] where the average calcium intake is 699 mg / d in a population aged between 16 and 59 years, and, also to those found in Tunisia [7] in the survey which concerned premenopausal

Tunisian women whose calcium intake was greater than 800 mg / day in only 4% of those concerned.

Conclusion

The results will be alarming, which encourages the immediate implementation of a prevention program for poor calcium status linked to the low calcium content of the food intake or its poor bioavailability in order to deal with the resulting pathological consequences such as osteoporosis exposing to major fracture risks. This survey must be reinforced by a study on a representative sample of the Algerian population.

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