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# EVALUATION OF THE VITAMIN D PROFILE IN PATIENTS SERVED BY A MACEIÓ-AL LABORATORY

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### ABSTRACT

Vitamin D is a hormone of great importance for vital body activities, as well as for the modulation of the immune system. Being acquired by food, but mainly by exposure to sunlight. Although reduced levels of vitamin D can cause problems related to bone mining, the excess of this is responsible for processes of intoxication. The present work aims to describe the levels of vitamin D of patients treated by a reference laboratory in the health district of Maceió-Al, describing the main affected population and producing a comparison of the levels in relation to social isolation. For this purpose, laboratory records were used considering the period from November 2019 to November 2020 and producing comparisons to sexes, age and analysis period of patients. In total, 1,025 vitamin D tests were performed, of which 27.4% of the patients were male and the other 82.6% were female. During the defined periods, greater numbers of exams were performed in the period of social relaxation. During the analyzed period, higher levels of deficiency were observed in adolescent and, mainly, elderly patients, compared to sexes, women had a higher level of deficiency and the highest levels of vitamin D deficiency during the period of social isolation.

**Keywords:** Vitamin D. Deficiency. Group of risk.

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## Introduction

Vitamin D is a fat-soluble hormone and has great importance for the body's homeostasis, playing an important role in vital cellular processes such as cell differentiation and proliferation, hormonal secretion and immunomodulatory activity 1.

Exposure to sunlight represents the best strategy for obtaining adequate vitamin D values, however this induced production is influenced by several factors, such as ethnicity, exposure period, time of day, latitude, season, cloudiness and air pollution. 2. It can also be acquired through food, as in vegetable foods, in the form of ergocalciferol, and in foods of animal origin, such as liver, fish and egg yolks 3.

Vitamin D deficiency is a public health problem in many countries and consists of lower than normal serum values for the age group and health conditions. Such deficiency, when for prolonged periods, can lead to the development of changes in bone mineralization processes, favoring the development of rickets and osteopenia 3, 4.

Vitamin D is of great importance in innate and acquired immune processes. The lack of this can lead to a decrease in humoral and mucosal antibodies, reduction in the bactericidal activity of phagocytes, formation of complement and deregulation of the number of lymphocytes and the concentration of their subtypes. Currently, several studies point to vitamin D as an extrinsic factor capable of affecting the prevalence of several autoimmune diseases, associating its deficiency with the uplift of diabetes mellitus, multiple sclerosis, systemic lupus erythematosus and rheumatoid arthritis. It also has an important function in hypersensitivity reactions, such as atopic dermatitis and asthma, and in various infections 5.

Elevated levels also represent damage to health, corresponding to intoxication, it can vary from asymptomatic to neuropsychiatric problems, commonly causing hypercalciuria. Renal lesions, pancreatitis, constipation, and venous calcifications may occur 6.

Given the above, knowing the profile of Vitamin D levels presented by specific populations may point to better management of some age groups and thus favor monitoring programs on the values of this important micronutrient for health maintenance and preventive assistance in diseases of various kinds .

## Objectives

### Main objective:

Evaluate the Vitamin D Dosage records, in the form of 25-Hydroxy-Vitamin-D from a reference laboratory located in the VI sanitary district of Maceió - AL.

### Specific objectives:

- Describe Vitamin D levels correlating to the patient's gender;
- Plot the average values of Vitamin D in the evaluated age groups;
- Point out the main population affected by Vitamin D deficiency;
- Assess Vitamin D levels in the population studied in view of social isolation due to the Covid-19 pandemic.

## Methodology

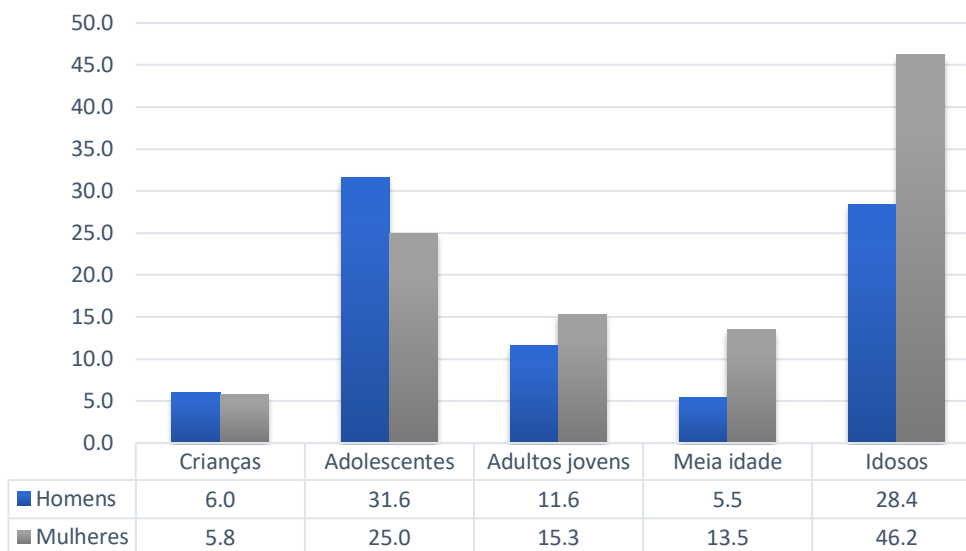
This is a retrospective study, whose data were obtained through laboratory records, considering only the patients who underwent the vitamin D dosage test from November 2019 to November 2020. For the age groups, patients with under 12 as children, between 12 and 19 as teenagers, between 20 and 44 as young adults, between 45 to 59 as half-life and over 60 as elderly, as defined by the World Health Organization (WHO). For the reference values, less than 20 ng / ml were considered as deficiency and greater than 100 ng / ml as intoxication. For the age group above 60 years, reference values above 30 ng / ml were considered for normal levels of Vitamin D, and consequently, levels below this limit were classified as deficiency. Three time intervals corresponding to the period before social isolation (November 2019 to March 17, 2020), during social isolation (from March 17 to July 3) and during quarantine relaxation (after 3 July).

## Result and Discursions

From November 2019 to November 2020, 1,025 vitamin D tests were performed, of which 281, equivalent to 27.4%, were men and 744, corresponding to 72.6%, women. Of the male patients, 50 were children, 19 adolescents, 69 young adults, 55 middle-aged and 88 elderly. The percentage of vitamin D deficiency in children was 6% (3), in adolescents 31.6% (6), young adults 11.6% (8), middle age 5.5% (3) and in the elderly 28.4% (25). In total, men had 16% (45) of vitamin D deficiency. Of the female

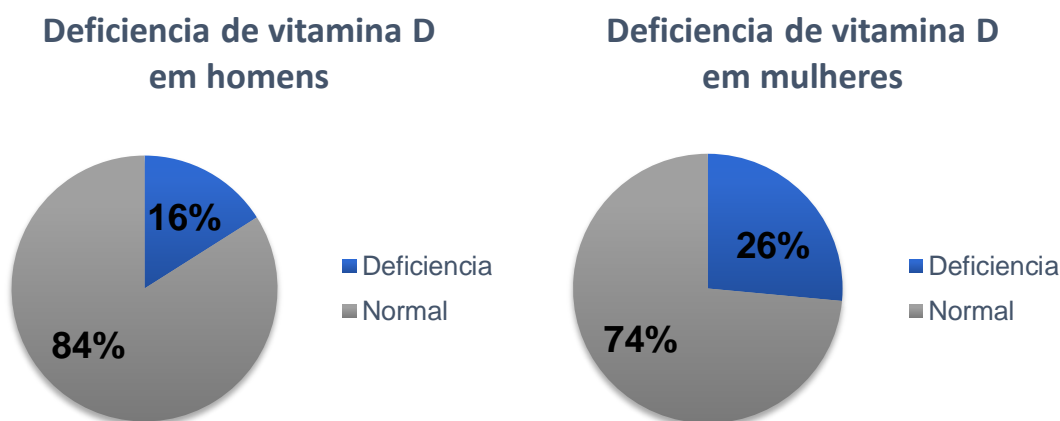
patients, 52 were children, 24 adolescents, 170 young adults, 208 middle-aged and 290 elderly. The percentage of vitamin D deficiency in children was 5.8% (6), in adolescents 25% (6), young adults 15.3% (26), middle age 13.5% (28), elderly 46, 2% (134). Women had a total of 26.5% (197) of patients with vitamin D deficiency and only one female patient belonging to the group of young adults showed levels compatible with vitamin D intoxication. according to sex, men presented 36.2 ng / ml and women 29.2 ng / ml.

**Graph 1. Comparison of the percentage of cases of vitamin D deficiency based on the age and sex of the patients.**



Source: own authorship.

**Graph 2. Comparison of total cases according to sex.**



Source: own authorship.

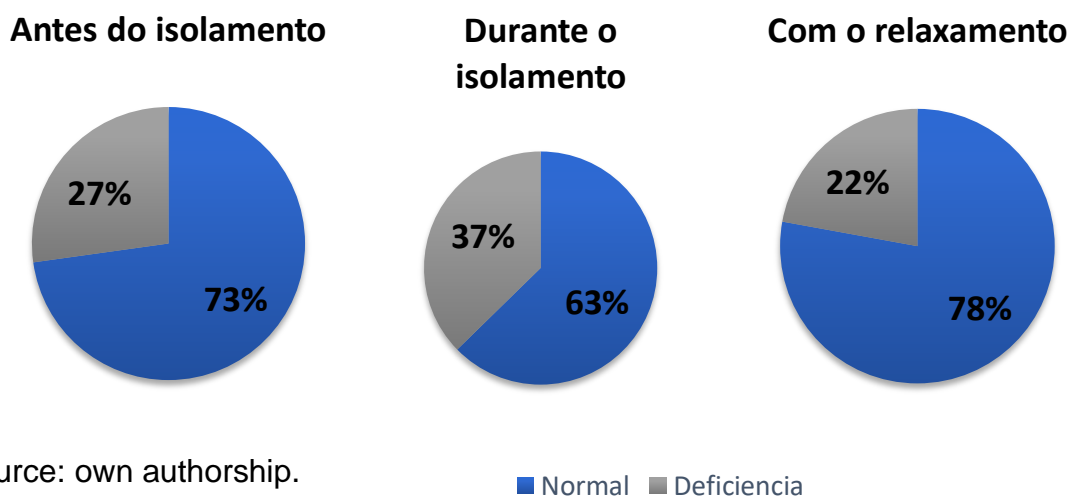
Both sexes showed high levels of vitamin D deficiency in the elderly. Currently, several studies highlight the role of this vitamin and its metabolites in increasing immunity in relation to viral infections of the respiratory system, in order to highlight its deficiency as one of the risk factors for Covid infections 19, correlating the high risk and mortality of elderly due to natural reduction of the immune system and endogenous production of vitamin D 7.

Women are more likely to develop autoimmune diseases when compared to men, such as lupus, which affects nine times more women. Age is also related to the appearance of these, older

people tend to be more susceptible to their development 8.

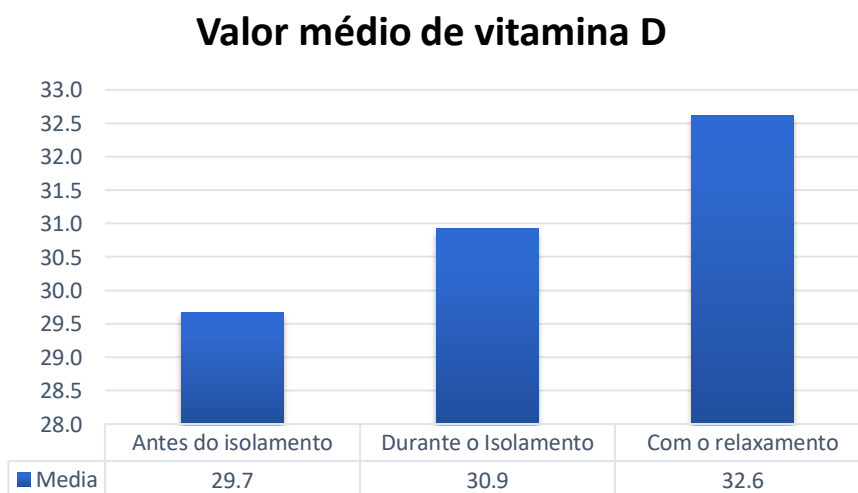
Based on the periods of time determined in relation to social isolation, 136 vitamin D exams were carried out before isolation, of which 27.2% (37) showed deficiency and mean values corresponding to 29.7. During social isolation, 67 exams were performed, of which 37.3% (25) resulted in disability and the average value corresponding to 30.9. With relaxation in quarantine, 822 exams were performed, with 22.4% showing vitamin D deficiency and the average value of results was 32.6.

**Graph 3. Difference in the percentage of vitamin D deficiency during the analyzed periods of time.**



Source: own authorship.

**Graph 4. Average vitamin D value during the analyzed periods of time.**



Source: own authorship.

## Conclusion

Female patients had a greater predisposition to vitamin D deficiency when compared to male patients. It was also observed that in both sexes the main groups affected were adolescents and the elderly.

The main population affected by vitamin D deficiency was women over the age of 65. There was a considerable increase in cases of vitamin D deficiency during the period of social isolation. There was also an increasing value in the average of vitamin D results as the quarantine progressed.

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