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# Anemia in elderly residents of a long-term care institution

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ABSTRACT

*Background:* The Brazilian elderly population is growing exponentially, making prevention and treatment of chronic diseases a priority in this age group. Anemia in older adults is underdiagnosed, undervalued and associated with high morbimortality.
*Objective:* To assess the prevalence of anemia in the elderly residents of a long-term care institution and to correlate this with individual patient history, the use of polypharmacy and mortality.
*Method:* A retrospective study was carried out of data extracted from medical records of patients treated in 2014 at the Hospital Geriátrico e de Convalescentes Dom Pedro II under the Preventive Actions Program.
*Results:* Data were collected from 88 female (48%) and 95 male (52%) elderly residents at a long-term care institution. Patient ages ranged from 60 to 102 years with a mean age of 76.3 years. Overall, 76 participants were diagnosed with anemia, representing 41% of the sample. Of those diagnosed, 35 were women (46%) and 41 were men (54%).
*Conclusion:* Anemia in the elderly is a clinical condition associated with increased morbimortality. However, the disorder remains underdiagnosed, resulting in higher risks for older adults. The present study found 76 patients with anemia among the 183 residents at the long-term care institution. The patient profile of this population with anemia is non-smokers, male, aged between 70 and 79 years, with normochromic/normocytic anemia and taking multiple medications.



## Introduction

The elderly population in Brazil, defined by the World Health Organization (WHO) as individuals over the age of 60 years, is growing rapidly. The latest census carried out in 2010 recorded a total population of 190,732,694, of whom 19,090,597 were over 60 years of age; the population projection for 2017 is 207,115,436 individuals.[1] The same census showed that there were 4,771,436 elderly in São Paulo State, representing 24.9% of the total Brazilian elderly population.[1]

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Anemia can be defined as a decrease in the hematocrit or hemoglobin (Hb) concentration, or red blood cell (RBC) count. This condition can affect the oxygen-carrying capacity, leading to insufficient oxygen to meet physiologic needs. Anemia is the most common blood disorder in the elderly.[2–4]

Measures that estimate circulating RBC mass are used to diagnose anemia. The exams required to diagnose the condition vary depending on level of clinical suspicion, but may include: whole blood count, iron studies (serum iron, total iron binding capacity, serum ferritin), serum vitamin B12 level, serum folate level, and a bone marrow exam.[1,2,5,6]

Anemia is considered an independent risk factor for various geriatric conditions, including frailty syndrome, functional decline, cognitive decline, increased morbidity, increased hospitalization and higher mortality. Therefore, its outcome reduces the quality of life and independence of the elderly population.[2,7–10]

In 2015 in Brazil, there were a total of 2433 hospital admissions of avoidable cases of anemia in elderly patients.[11,12]

According to the WHO, anemia in women is classified as mild when Hb values are between 11.0 and 11.9 g/dL, moderate for Hb from 8.0 to 10.9 g/dL and severe for levels under 8 mg/dL. The only difference for men is the value for mild anemia, which is defined as Hb of between 11.0 and 12.9 g/dL.

Anemia in the elderly can be classified under three main categories that may be concomitant: nutritional deficiency (iron, folate or vitamin B12), anemia of inflammation or of chronic disease, and unexplained anemia.[1]

The aim of this study was to assess the prevalence of anemia in the elderly patients of a long-term care institution and to correlate this with individual patient history, polypharmacy and mortality.

## Method

The *Hospital Geriátrico e de Convalescentes Dom Pedro II* is a long-term institution that was founded more than 100 years ago. It houses patients with some degree of dependency and without the possibility of living alone, who do not have social support or whose families are unable to provide adequate and dignified care for them.

A retrospective study was carried out of data extracted from the medical records of patients treated in 2014 by the institution under the Preventive Actions Program (PAP). The medical records of the institution contain a standardized geriatric evaluation completed in the first evaluation of the patient.

The goals of the PAP are to define and routinely apply standardized protocols in institutionalized patients to prevent high impact and/or highly prevalent diseases in the elderly at long-term care institutions. The PAP patients were chosen randomly from the total number of long-term institutional residents with each physician at the institution being responsible for the evaluation of ten patients. The program started in March 2009 and addressed four circumstances:

1. Primary prevention entails actions aimed at avoiding diseases by tackling causal factors, such as vaccines, adequate nutrition and oral health.
2. Secondary prevention encompasses a group of actions aimed at reducing the prevalence of diseases through early diagnosis and treatment with screening exams, including the complete blood count (CBC).
3. Tertiary prevention comprises actions aimed at reducing the disabilities caused by sequelae of diseases.
4. Quaternary prevention seeks to avert iatrogenic events and hospital admission-related complications.

**Table 1 – Reference values for hematologic parameters stratified by gender.**

| Parameter | Women | Men |
|---|---|---|
| Hemoglobin – g/dL | 12.0 | 13.0 |
| MCV – fl | 81.0–99.0 | 80.0–98.0 |
| MCHC – g/dL | 32.0–35.8 | 32.0–37.0 |

MCV: mean corpuscular volume; MCHC: mean corpuscular hemoglobin concentration.

The following variables, based on information previously collected by the PAP, were analyzed: name, age, gender, ethnicity, duration of institutional care, comorbidities, lifestyle, substance use and medications being taken. This information was correlated with the prevalence and type of anemia of the residents.

The definition of anemia for the present study was based on the WHO criteria and included analysis of the RBC parameters, mean corpuscular volume and mean corpuscular hemoglobin concentration (Table 1). The diagnosis of anemia in patients was performed using the CBC performed during the secondary prevention measures.

The inclusion criteria were patients aged 60 years or older admitted to the institution before January 2014 and assessed by the PAP in 2014.

## Results

Data were collected for 183 residents at the long-term care institution; 88 women (48%) and 95 men (52%). Their ages ranged from 60 to 102 years with a mean of 76.3 years. On stratifying participants by age group, 50 (27.3%) were from 60 to 69 years old, 62 (33.87%) were from 70 to 79 years old, 59 (32.24%) were from 80 to 89 years old and 12 (6.56%) were over 90 years of age.

There were 18 (9.84%) deaths among the participants during the course of 2014, nine (50%) of whom had anemia.

Overall, 76 of the residents were diagnosed with anemia, representing 41% of the sample. The group diagnosed with anemia comprised 36 women (47.4%) and 40 men (52.6%). Table 2 shows the descriptive measures for Hb in patients with and without anemia. The 95% confidence intervals related to Hb were 10.69–11.3 and 13.67–14.16 for patients with and without anemia, respectively.

Analysis of the type of anemia showed that 46 (60.53%) patients had normochromic/normocytic anemia (22 women and 24 men), 14 (18.42%) had hypochromic/microcytic anemia (8 women and 6 men), six (7.89%) had normochromic/microcytic anemia (1 woman and 5 men), nine (11.84%) had normochromic/macrocytic anemia (6