

EPIDEMIOLOGICAL PROFILE OF PROXIMAL FEMORAL FRACTURES IN OLDER ADULTS AT THE REGIONAL HOSPITAL IN COTIA – SP, BRAZIL

PERFIL EPIDEMIOLÓGICO EM FRATURA DE FÊMUR PROXIMAL DE IDOSOS NO HOSPITAL REGIONAL DE COTIA – SP

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ABSTRACT

Objective: To identify the epidemiological profile of older patients with proximal femoral fractures treated at the Hospital Regional de Cotia, SP – Brazil, and describe the nutritional status of these patients. **Methods:** Data were obtained from the electronic patient medical records from August 2020 to April 2021. The variables studied were age, gender, ethnicity, weight and height (for BMI calculation), and presence of comorbidities. Fracture circumstances were also assessed, including trauma mechanism, anatomical location, and treatment. Moreover, the nutritional profile of patients was assessed using the Mini Nutritional Assessment (MAN). **Results:** Most patients were white women, with a mean age of 80 years and an average BMI of 23.55 kg/m². Almost all patients suffered the fracture at home and the most common comorbidities were systemic arterial hypertension, *diabetes mellitus*, and Alzheimer's disease. Most patients were considered to be malnourished or at risk of malnutrition. **Conclusion:** The nutritional status of older adults seems to be directly related to the risk of proximal fractures of the femur. **Level of Evidence II, Retrospective Study.**

Keywords: Orthopedics. Epidemiology. Femoral Fractures. Femur. Malnutrition.

RESUMO

Objetivo: Traçar o perfil epidemiológico dos pacientes idosos com fratura de fêmur proximal atendidos no Hospital Regional de Cotia – SP, além de descrever o estado nutricional desses pacientes. **Método:** As informações para confecção deste trabalho foram obtidas a partir dos prontuários eletrônicos dos pacientes atendidos no período agosto de 2020 a abril de 2021. As variáveis estudadas foram: idade, sexo, etnia, peso e altura (para cálculo do índice de massa corporal – IMC) e presença de comorbidades. Também foram avaliadas as circunstâncias da fratura, tais como mecanismo do trauma, localização anatômica e tratamento instituído. Ainda, avaliou-se o perfil nutricional dos pacientes por meio da Mini Avaliação Nutricional (Mini-MAN). **Resultados:** Predominaram pacientes do sexo feminino, brancas, com média de 80 anos de idade e IMC médio de 23,55 kg/m². Quase todos os pacientes se acidentaram em casa, e as comorbidades mais observadas foram hipertensão arterial sistêmica, *diabetes mellitus* e doença de Alzheimer. A grande maioria dos pacientes foi considerada desnutrida ou em risco de desnutrição. **Conclusão:** O estado nutricional dos idosos parece estar diretamente relacionado ao risco de fraturas proximais do fêmur. **Nível de Evidência II, Estudo Retrospectivo.**

Descritores: Ortopedia. Epidemiologia. Fraturas do Fêmur. Fêmur. Desnutrição.

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INTRODUCTION

For the World Health Organization (WHO) and the Brazilian Ministry of Health, based on the legal framework of the National Health Policy for the Elderly and the Statute of the Elderly, all individuals aged 60 years or older are biologically considered as older adults.¹ Estimates show that more than 2 billion people will be older than 60 years by 2050, indicating how population ageing is a worldwide phenomenon. Brazil, for example, has a marked growth rate of

approximately 260,000 new older adults per year. The probability of falling is higher at this stage of life, which has been showing aggravating incidence of hip fractures.²

Life expectancy has been increasing mainly because of better living conditions and the constant advancement of modern medicine. Aging, however, implies several problems, including fractures in the proximal region of the femur – a common and relevant cause of morbidity and mortality in older people.³

All authors declare no potential conflict of interest related to this article.

The study was conducted at Hospital Regional de Cotia.

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Estimates show that in 2050 about 6.5 million hip fractures will occur worldwide¹. The incidence of these fractures among older adults is increasing especially due to osteoporosis but also to other risk factors, such as the presence of diseases and comorbidities, previous history of falls, smoking, and body mass index under 18.5 kg/m².²⁻⁴ Osteoporosis is a state of health characterized by increased risk of fracture from weakened bone tissue structure. When individuals suffer their first fracture caused by fragility, they are diagnosed with “established osteoporosis”. From then on, they have a higher risk of fracture occurrence than patients with no previous fracture, requiring more intensive therapeutic intervention.¹

Femoral fracture is among the most common traumatic injuries in older adults and may occur in the proximal, distal, or femoral diaphysis regions. Since the bone can transfer load during movement, a fracture results in loss of bone structural integrity. Older adults who remain immobilized for long periods of time thus become weaker, with lower functionality. Proximal fracture is the most common type of femoral fracture, being classified as intracapsular or extracapsular.⁵

Intracapsular fractures are identified as femoral neck fractures while extracapsular fractures are the transtrochanteric, out of which the most common are intertrochanteric fractures. These proximal femoral fractures are considered a serious problem in public health because of the high economic costs for their treatment and their high morbidity and mortality rates.⁵

The natural decline of physiological functions in aging leads to a lower absorption and metabolism of nutrients and several other natural transformations, including increased body fat and reduced bone mass and lean muscle mass. Social and economic issues also hinder achieving a healthy diet and maintaining an adequate nutritional status, thus increasing the risk of malnutrition.⁶

Besides malnutrition and its complications, other factors which affect the nutritional status of older people are the use of various medications (polypharmacy), routine changes (habits, schedules, and environments that impair adequate food intake), and lack of adequate nutritional assessment and monitoring. Nutritional assessment at admission decreases the risk of developing malnutrition during hospitalization and prevents worsening of the clinical picture in already malnourished patients.⁶ Establishing early nutritional diagnosis with appropriate tools and resources available in the hospital is therefore essential.

The nutritional assessment of older people should be conducted judiciously, considering the changes caused by senescence in body composition. As an example, if an older adult has a slight decrease in weight and height, these data should not be interpreted as pathological. Their weight decreases because of the loss of bone and muscle mass and the physiological reduction of appetite, whereas height changes over the decades – mainly due to pes planus, decreased height of vertebrae and intervertebral discs, and postural changes. Several tools can be used for the nutritional assessment of older people.⁷

This study aimed to describe the epidemiological profile of proximal femoral fracture in older adults at the Hospital Regional de Cotia – SP and to describe the nutritional status of these individuals.

MATERIAL AND METHODS

A retrospective study was conducted to describe the profile of older patients with femoral fracture at the Hospital Regional de Cotia – SP using data collected from the Tasy[®] electronic medical record from August 2020 to April 2021. Inclusion criteria were patients aged 60 years or older with proximal femur fracture and who agreed to participate in the study by signing an informed consent form (ICF). The exclusion criteria were patients with subtrochanteric, diaphyseal, or distal femoral fractures, high-energy trauma mechanism (such as motorcycle accident, gunshot wound), older than 100 or younger than 60, and who did not sign the ICF.

The analyzed variables were age, gender, ethnicity, weight and height (to calculate BMI), and presence of comorbidities. Fracture circumstances were also analyzed, including trauma mechanism, anatomical location, and assigned treatment. The nutritional profile of older patients was assessed via Mini Nutritional Assessment (MNA),⁸ which classifies the nutritional state of patients as “normal,” “at risk of malnutrition,” or “malnourished” by a score scale. Anthropometric data such as body mass index (PAHO) were also collected.

RESULTS

In total, 48 patients were assessed, out of which 34 (71%) were women and 14 (29%) were men (Figure 1). On ethnicity, 43 (90%) patients considered themselves white and five (10%) considered themselves black (Figure 2).

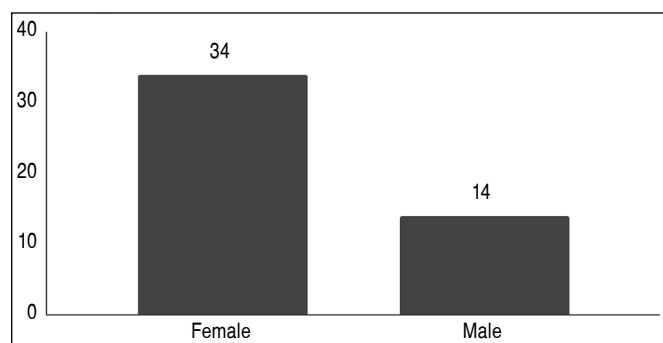


Figure 1. Patient distribution by gender.

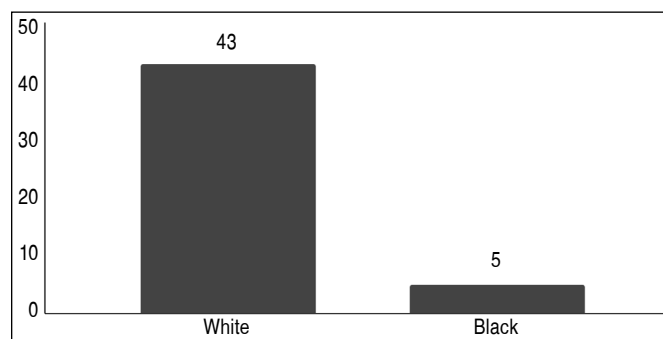


Figure 2. Patient distribution by ethnicity.

Of all patients, 47 (98%) suffered the fracture at home and one (2%) suffered it outside (Figure 3). The most common type of fracture was femoral neck fracture (26 cases – 56%) and the second most common were transtrochanteric fractures (22 cases – 46%) (Figure 4). All patients underwent surgical treatment.

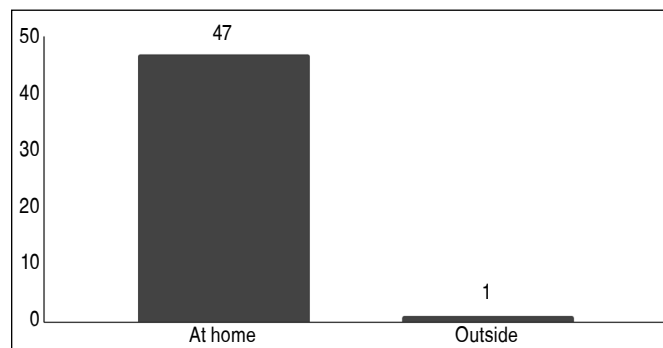


Figure 3. Distribution of fracture occurrence.

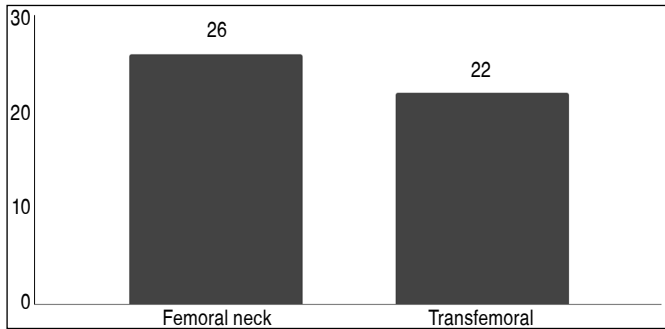


Figure 4. Patient distribution by fracture site.

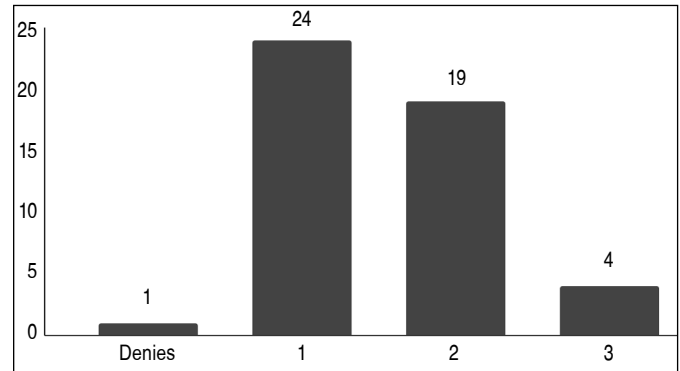


Figure 7. Patient distribution by number of comorbidities.

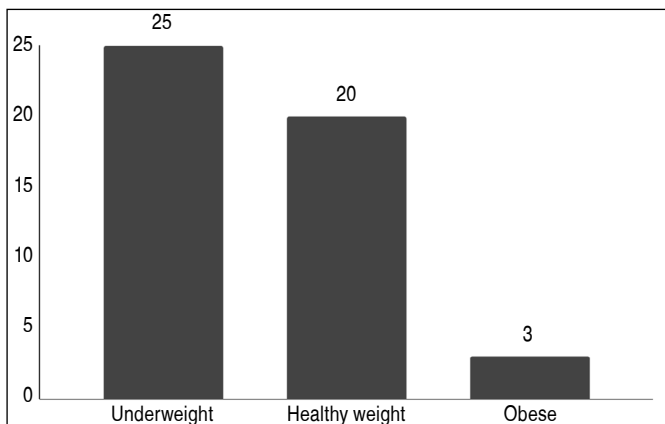


Figure 5. Patient distribution by BMI.

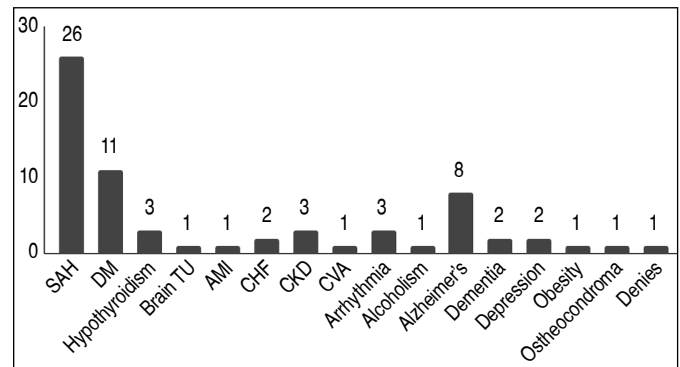


Figure 8. Patient distribution by comorbidities presented.

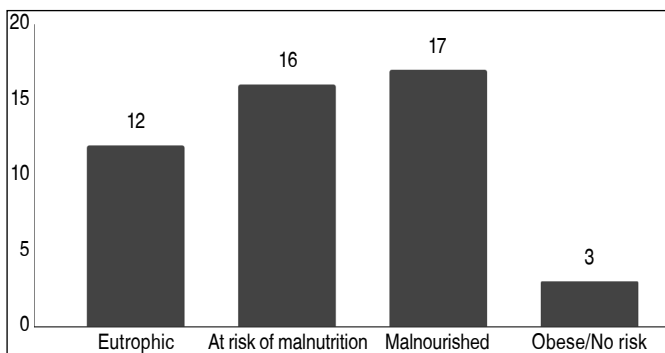


Figure 6. Patient distribution according to MAN scale.

Regarding dispersion measures, the maximum age of patients was 99 years, the minimum was 62 years, and the mean age was 80.25 years. The mean BMI was 23.55 kg/m², with a minimum of 12.05 kg/m² and a maximum of 34.21 kg/m². The mean number of comorbidities was 1.54, with a minimum of 0 and a maximum of 3. Table 1 summarizes these results.

Table 1. Dispersion of data related to age, BMI, and number of comorbidities.

Variables	Minimum	Maximum	Mean
Age (years old)	62	99	80.25
BMI (kg/m ²)	12.05	34.21	23.55
Number of comorbidities	0	3	1.54

DISCUSSION

This study showed that most patients with proximal femoral fractures were Caucasian women. The proportion found in this study was similar to that found by Daniachi et al.,⁹ who assessed the epidemiology of fractures in the proximal third of the femur. According to the authors, for each man, three women have proximal femoral fractures. Furthermore, the percentage obtained in this study for sex and ethnicity was similar to that of Machado et al.¹⁰ Corroborating the results of Daniachi et al.⁹ on location of fracture occurrence, almost all injuries of patients occurred at home, where older people spend most of their time. This could be associated with the comorbidities found in the group of patients assessed. In this study, most fractures were femoral neck fractures and the remaining cases were transtrochanteric fractures. In the study by Daniachi et al.,⁹ femoral neck fracture was the second most observed type of injury, while transtrochanteric fractures were the most common. This could be related to the most frequent trauma mechanisms in each sample.

Most of the older patients assessed in this study were underweight, others had healthy weight, and a few were obese. In their case-control study, Pagani et al.¹¹ showed that older patients with lower BMIs were precisely in the group of those who suffer the most fractures. Corroborating these results, Alfaro-Acha et al.¹² reported that body weight and risk of fracture of the proximal femoral extremity are inversely related. The authors also reported that a 10% weight loss significantly increased the risk of hip fracture in people aged 65 years or older. These suggest that our results are mainly determined by the deficient nutritional status of patients.

The MAN scale found similar percentages of malnourished older adults and older adults at risk of malnutrition, which represent, respectively, the first and second most observed findings. Dias et al.¹³ found that most of their patients were also malnourished or at risk of malnutrition, showing that the nutritional status of older adults is related to the risk of femoral fractures.

Regarding the number of comorbidities per patient, most patients had only one comorbidity, followed by those with two comorbidities. In their study, Hungria Neto et al.³ found a similar scenario, in which most individuals in the age group analyzed already had at least one comorbidity – mainly SAH, DM, and osteoporosis. In our study, the most observed comorbidities were, respectively, SAH, DM, and

Alzheimer's disease. Our results differ from those of Dias et al.,¹³ who indicated that SAH, DM, Alzheimer's, and osteoporosis are diseases typically related to older adults.

The death rate observed in our study can be considered low. According to Mesquita et al.,¹⁴ mortality rates in this group of patients range from 7.4% to 34.8%.

Finally, the dispersion measurements obtained for age, BMI, and number of comorbidities were similar to those obtained by Hungria Neto et al.³. This shows that in groups of older adults from different localities and analyzed in different years, those who suffered fractures of the proximal third of the femur can have similar characteristics.

CONCLUSION

In this study, most patients were women (3:1) with a mean age of 80 years, Caucasian, underweight, and with at least one associated comorbidity – mainly SAH, DM, and Alzheimer's. Most fractures occurred when patients were at home, the most common being the proximal femoral fracture. Furthermore, considering that patients malnourished or at risk of malnutrition were most likely to suffer fractures, the nutritional status of the patients was directly related to fracture risk.

AUTHORS' CONTRIBUTIONS: Each author contributed individually and significantly to the development of this article. SAEF, WFN, MK, HVRQ, JKKE, REI: study conception and design, analysis and interpretation of the data, writing of manuscript and critical review of its intellectual content, and final approval of the final version of the manuscript.

REFERENCES

1. Soares DS, Mello LM, Silva AS, Martinez EZ, Nunes AA. Fraturas de fêmur em idosos no Brasil: análise espaço-temporal de 2008 a 2012. *Cad Saude Publica*. 2014;30(12):2669-78.
2. Fortes EM, Raffaelli MP, Bracco OL, Takata ETT, Reis FB, Santili C, Lazaretti-Castro M. Elevada morbimortalidade e reduzida taxa de diagnóstico de osteoporose em idosos com fratura de fêmur proximal na cidade de São Paulo. *Arq Bras Endocrinol Metabol*. 2008;52(7):1106-14.
3. Hungria Neto JS, Dias CR, Almeida JDB. Características epidemiológicas e causas da fratura do terço proximal do fêmur em idosos. *Rev Bras Ortop*. 2011;46(6):660-7.
4. Muniz CF, Arnaut AC, Yoshida M, Trelha CS. Caracterização dos idosos com fratura de fêmur proximal atendidos em hospital escola público. *Espaç Saude*. 2007;8(2):33-8.
5. Soares DS, Mello LM, Silva AS, Nunes AA. Análise dos fatores associados a quedas com fratura de fêmur em idosos: um estudo caso-controle. *Rev Bras Geriatr Gerontol*. 2015;18(2):239-48.
6. Pala D, Silva LF, Bastos AQA, Silva WM, Nemer ASA. Perfil nutricional de idosos hospitalizados. *Rev Bras Nutr Clin*. 2011;26(4):227-33.
7. Santos ACO, Machado MMO, Leite EM. Envelhecimento e alterações do estado nutricional. *Geriatr Gerontol Aging*. 2010;4(3):168-75.
8. Guigoz Y, Vellas B, Garry PJ. Assessing the nutritional status of the elderly: the Mini Nutritional Assessment as part of the geriatric evaluation. *Nutr Rev*. 1996;54(1):S59-65.
9. Daniachi D, Santos Netto A, Ono NK, Guimarães RP, Polesello GC, Honda EK. Epidemiologia das fraturas do terço proximal do fêmur em pacientes idosos. *Rev Bras Ortop*. 2015;50(4):371-7.
10. Machado AM, Braga ALF, Garcia MLB, Martins LC. Avaliação da qualidade de vida em idosos pós-fratura da extremidade proximal do fêmur. *Arq Bras Cienc Saude*. 2012;37(2):70-5.
11. Pagani RC, Kunz RE, Girardi R, Guerra M. Índice de massa corporal como fator prognóstico para fratura da extremidade proximal do fêmur: um estudo de caso-controle. *Rev Bras Ortop*. 2014;49(5):461-7.
12. Alfaro-Acha A, Ostir GV, Markides KS, Ottenbacher KJ. Cognitive status, body mass index, and hip fracture in older Hispanic adults. *J Am Geriatr Soc*. 2006;54(8):1251-5.
13. Dias TRS, Batista BB, Chang RWML, Noriega JEA, Figueiredo GLP. Avaliação do estado nutricional e correlação com complicações cirúrgicas em pacientes idosos submetidos a tratamento cirúrgico de fratura do fêmur proximal. *Rev Bras Ortop*. 2021;56(1):104-8.
14. Mesquita GV, Lima MALTA, Santos AMR, Alves ELM, Brito JNPO, Martins MCC. Morbimortalidade em idosos por fratura proximal do fêmur. *Texto Contexto Enferm*. 2009;18(1):67-73.