

HOSPITALIZATION OF ELDERLY PEOPLE FOR CONDITIONS SENSITIVE TO PRIMARY HEALTH CARE IN A CITY IN THE TRIÂNGULO MINEIRO

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Abstract

This study aimed to analyze the profile of hospitalizations sensitive to primary care in the elderly according to age and sex. This is an ecological study with description of sensitive hospitalizations of elderly residents in the city of Uberaba - MG from 2009 to 2018. The proportion of hospitalizations for sensitive conditions compared to the total number of hospitalizations and the rates of sensitive hospitalizations were analyzed. For the other analyzes, the causes of hospitalization by age and sex were analyzed, and descriptive analyzes were carried out in terms of frequency and percentage. The proportion of sensitive hospitalizations decreased in the period between 2009 and 2016, with the most expressive groups of causes related to the cardiovascular system (heart failure, angina, and cerebrovascular diseases), elderly people aged 80 years and over and male. Ecological studies with public domain data are of fundamental importance in the analysis of the health conditions of the populations and in the direction of the health actions undertaken, especially those carried out by Primary Health Care (PHC).

Keywords: Aging. Family Health Strategy. Hospitalization.

1. Introduction

Since the implementation of the Unified Health System (SUS - *Sistema Único de Saúde*, in Portuguese), several advances in Primary Health Care (PHC) were evident to implement its principles and guidelines. From the 1990s, through the Family Health Strategy (FHS), PHC has sought to expand and consolidate it in the development of health promotion, prevention, and recovery actions within the scope of public health (Rehem et al. 2013a; Brasil 2017).

Nowadays, the implementation of health care networks emerges, which highlights PHC as the ordering of the health system, guaranteeing the continuity and integrality of care (Organização Pan-Americana de Saúde 2011; Arruda et al. 2015). Studies report that actions taken at primary health levels have a high potential to modify the morbidity and mortality profile, with a consequent improvement in the quality of life of users and health indicators (Paho 2011; Sá et al. 2016)

The FHS was adopted to order and standardize actions at the primary level, establishing reference teams, territories of operation, and attributes of the work process based on SUS principles and guidelines

(Brasil 2017). The literature shows that health systems organized by PHC, especially those with a population coverage above 70%, have lower rates of hospitalization for certain diseases with a consequent decrease in health costs (Alfradique et al. 2009; Paho 2011; Skinner et al. 2016).

In view of the consolidation of the FHS as a strategy adopted for the implementation of PHC, there is a need for studies to assess the effectiveness of PHC through indicators that collaborate in the planning and assessment of the determinants of the health-disease process, among which there is Hospitalization for Ambulatory Care Sensitive Conditions (ACSC) (Alfradique et al. 2009; Maia et al. 2019).

The term ACSC was developed by John Billings et al. (1990), in the United States in the mid-1980s, under the name Ambulatory Care Sensitive Conditions. In this sense, the hypothesis that disparities in hospitalizations for certain diseases considered easy to prevent, or for those that would be subject to early diagnosis and treatment, in order to avoid hospitalization, proved to reflect the inadequacy of PHC to the needs of certain communities.

According to this model, for some health problems, timely and good quality PHC, through preventive actions, early diagnosis and timely treatment of acute health problems, and monitoring and control of chronic problems, can prevent hospitalization or reduce your frequency (Maia et al. 2019). In Brazil, ACSC were defined through Ordinance GM/MS 221 of April 17, 2008, which establishes the list of diagnoses of the International Classification of Diseases - ICD-10, organized in 19 groups, and defines it as an indirect assessment tool of PHC (Brasil 2008; Alfradique et al. 2009; Brasil 2014).

In the analysis of ACSCs as performance indicators, variables related to the studied population, such as age, must be considered. Therefore, it is recommended that the different life cycles be studied separately (Alfradique et al. 2009). Studies of ACSCs in the elderly population show the potential use of this indicator (Santos et al. 2013; Marques et al. 2014; Rodrigues-Bastos et al. 2014)

As pointed out by Maciel et al. (2014), the state of Minas Gerais showed a 68.87 points reduction in ACSC rates and an increase of 9.87 points in other hospitalization rates for non-sensitive causes in the period from 2003 to 2012. In Curitiba - PR, in the period from 2005 to 2007, hospitalizations for ACSC showed stabilization, greater representativeness for females, and the age group above 65 years, being the most frequent causes of angina and heart failure (Rehem et al. 2013a). For the municipality of Guarulhos - SP, the ACSCs showed an increasing trajectory between 2008 and 2012, with a percentage increase of more than 20%, with greater frequency in the age group above 65 years, for both sexes, the most frequent causes being heart failure, cerebrovascular diseases, and angina (Melo and Egry 2014).

Nowadays, rapid aging of the population is observed worldwide, making the health of the elderly one of the priorities for public health today (Garcia 2017). Although hospitalization is the only therapeutic possibility for some elderly people, the risks involved in a hospitalization process must be considered: immobility, incontinence, malnutrition, depression, development of comorbidities, cognitive decline, among others (Nunes et al. 2017; Carvalho et al. 2018; Covino et al. 2019;).

There is a lack of studies addressing ACSCs considering the elderly population when considering that aging can lead to different morbidity and mortality profiles. Thus, recognizing the sensitive causes in the elderly and their impact can favor the unveiling of the actions undertaken in PHC to the elderly and direct the planning of actions that can contribute to the reduction of preventable hospitalizations in this population.

Considering the publication of the Brazilian list of ACSC and the recognition of the FHS as a point of the health care network in our country, this study aimed to analyze the profile of hospitalizations sensitive to primary care in the elderly, in the city of Uberaba - MG, according to age group, groups of causes and sex, in the period from 2009 to 2018.

2. Material and Methods

This is an ecological, descriptive study of the ACSC of residents in the city of Uberaba - MG, registered in the Hospitalization System (SIH – Sistema de Internação Hospitalar) from 2009 to 2018. Data were collected in the months of February and March 2019, by a previously trained doctoral student. The period used was due to the update of the data available at the SIH/SUS Department of Informatics.

The municipality of this study is the hub of the Health Macro-region of the "Triângulo Sul", with an estimated population of 325,279 inhabitants in 2016, presenting specificity because of the high

proportionality of the elderly. While for Brazil this rate is 8.5%, for the state of Minas Gerais it is 11.7%. However, when considering only the municipality, this proportion of people aged 60 or over was 12.6% (Brasil 2016).

As for the FHS coverage in the municipality, data from the Department of Primary Care of the Ministry of Health show that during the study period there was a decline from 55.4% (2009) to 53.0% (2018), totaling 50 teams deployed (Brasil 2020).

Hospitalization and population data were collected from SIH and the Brazilian Institute of Geography and Statistics (IBGE), available on the SUS Department of Informatics website (www.datasus.gov.br). SIH is a source of information on hospitalizations carried out within the scope of the Brazilian public sector and the private network, your information being based on the Hospitalization Authorization - AIH, which is the document filled in at the time of admission for subsequent reimbursement by SUS, which contains patient identification information, diagnoses and procedures performed.

Sensitive conditions were selected based on the diagnoses present in the Brazilian list of ACSC and also in the 10th International Classification of Diseases and Related Health Problems (ICD-10), namely: preventable diseases by immunization and sensitive conditions (A33-A37, A95, B16, B05-B06, B26, G00.0, A17.0, A19, A15-A16, A18, A17.1-A17.9, I00-I02, A51-A53, B50-B54 and B77); infectious gastroenteritis and complications (E86 and A00-A09); anemia (D50); nutritional deficiencies (E40-E46 and E50-E64); ear, nose and throat infections (H66, J00-J03, J06 and J31); bacterial pneumonias (J13-J14, J15.3-J15.4, J15.8-J15.9 and J18.1); asthma (J45-J46); lower airway diseases (J20, J21, J40-J44 and J47); hypertension (I10-I11); angina (I20); heart failure (I50 and J81); cerebrovascular diseases (I63-I67, I69 and G45-G46); diabetes mellitus (E10-E14); epilepsies (G40-G41); kidney and urinary tract infection (N10-N12, N30, N34 and N39.0); infection of the skin and subcutaneous tissue (A46, L01-L04 and L08); inflammatory disease of the female pelvic organs (N70-N73 and N75-N76); gastrointestinal ulcer (K25-K28, K92.0, K92.1 and K92.2), reported in both sexes (Brasil 2008). The group of diseases related to prenatal care and childbirth (O23, A50, and P35.0) was not considered in this study because it is not part of the events that affect the elderly population.

For a better understanding of hospitalizations, the age group was subdivided into groups: 60 to 69 years; 70 to 79 years, and 80 years or more. The years were grouped into the following biennia: 2009-2010; 2011-2012; 2013-2014; 2015-2016 and 2017-2018.

For the calculation of ACSC rates, the data were tabulated in the TabWin program version 4.1.1 and were selected using the Notebook of Guidelines, Objectives, Goals, and Indicators published by the Ministry of Health (Brasil 2014). The national tables and definition files were downloaded from DATASUS and stored for the extraction of data used in the research.

The primary database extracted from TabWin was composed of all hospitalizations of elderly residents in Uberaba during the study period ($n = 61,888$). From this bank, sensitive admissions were selected based on ICD-10 codes in accordance with the ACSC list.

An analysis was carried out regarding the proportion of hospitalizations due to total sensitive conditions, being calculated based on the total number of HACSC, divided by the total number of hospitalizations according to the age group and year of occurrence, multiplying by 100, as well as the HACSC rate (per 1,000 inhabitants). The hospitalization rate was calculated by dividing the number of HACSC by the population estimated by the IBGE for 2016. For the other analyzes, the causes of HACSC by age and sex were analyzed, and descriptive analyzes were carried out as to frequency and percentage of causes according to the variables under study.

According to Resolution 510/2016 of the National Research Council, as the data used are in the public domain, there is no need for evaluation of the study by a Research Ethics Committee involving human beings.

3. Results

Between 2009 and 2018, there were a total of 61,888 hospitalizations for the elderly population in Uberaba. Of this total, 20.4% were hospitalizations sensitive to primary care ($n = 12,607$). Considering the distribution of ACSCs over the biennia studied, there is a reduction in the percentage of sensitive hospitalizations from 2009/2010 to 2015/2016 and an increase in 2017/2018 for all age groups (Table 1).

Table 1. Proportion of hospitalizations of the elderly population according to sensitive and non-sensitive conditions, by biennium and age group, Uberaba - MG, 2009 to 2018.

Cause	2009-2010	2011-2012	2013-2014	2015-2016	2017-2018	Total
	%	%	%	%	%	%
60 - 69 years old						
Non-sensitive	76,8	81,0	84,7	85,4	83,3	82,5
Sensitive	23,2	19,0	15,3	14,6	16,7	17,5
Total	100,0	100,0	100,0	100,0	100,0	100,0
70 - 79 years old						
Non-sensitive	70,9	78,3	81,4	82,6	77,9	78,3
Sensitive	29,1	21,7	18,6	17,4	22,1	21,7
Total	100,0	100,0	100,0	100,0	100,0	100,0
80 years old or above						
Non-sensitive	65,5	73,8	78,8	80,6	74,9	74,9
Sensitive	34,5	26,2	21,2	19,4	25,1	25,1
Total	100,0	100,0	100,0	100,0	100,0	100,0

Source: DATASUS. SUS Hospital Information System.

When considering the age groups, the HACSC rates were higher for the groups of long-lived older people, with higher rates for the elderly aged 80 years in the analyzed period. It is also noteworthy that over the years, rates have increased, except in the biennium 2011/2012 to 2013/2014, which practically remains stable for the age group 70 to 79 years (Table 2).

Table 2. Rates (1,000 inhabitants) of HACSC of the elderly population according to age group, by biennium, Uberaba - MG, 2009 to 2018.

Age group	2009 - 2010	2011 - 2012	2013 - 2014	2015 - 2016	2017 - 2018
60 - 69 years	234	249	270	296	343
70 - 79 years	326	338	337	373	410
80 years or above	408	367	406	450	496
Total	288	294	311	342	386

Source: DATASUS. SUS Hospital Information System.

Among the groups of causes of ACSC, it was found that the diseases related to the cardiovascular system were the most prevalent for all age groups, representing about 64.0% of the total of sensitive hospitalizations (Table 3).

Hospitalizations for angina, heart failure, and cerebrovascular diseases were more prevalent in decreasing order for groups 60 to 69 years old and 70 to 79 years old. For the group of octogenarians (80 years old or more), heart failure was more prevalent (22.0%), followed by cerebrovascular diseases (21.2%) and bacterial pneumonia is the third group (16.1%), angina being the fourth most prevalent cause (11.8%) for this group, as shown in Table 3.

Table 3. Number and proportion of hospitalizations for sensitive conditions, according to groups of sensitive individuals and age group, Uberaba - MG, 2009 to 2018.

Cause Groups	60 to 69 years		70 to 79 years		80 years or older		Total	
	N	%	N	%	N	%	N	%
Angina	1458	28,8	1067	22,9	341	11,8	2866	22,7
Cardiac insufficiency	1041	20,6	976	21,0	637	22,0	2654	21,1
Cerebrovascular diseases	951	18,8	967	20,8	613	21,2	2531	20,1
Bacterial pneumonia	280	5,5	385	8,3	467	16,1	1132	9,0
Lung diseases	311	6,2	395	8,5	200	6,9	906	7,2
Kidney and urinary tract infection	229	4,5	268	5,8	294	10,2	791	6,3
Gastrointestinal ulcer	185	3,7	145	3,1	106	3,7	436	3,5
Diabetes mellitus	244	4,8	106	2,3	51	1,8	401	3,2
Skin infection	121	2,4	85	1,8	53	1,8	259	2,1
Nutritional deficiencies	45	0,9	118	2,5	28	1,0	191	1,5
Epilepsy	54	1,1	38	0,8	18	0,6	110	0,9
Diseases preventable by immunization	36	0,7	24	0,5	22	0,8	82	0,7
Hypertension	41	0,8	29	0,6	17	0,6	87	0,7
Infectious gastroenteritis	22	0,4	26	0,6	23	0,8	71	0,6
Asthma	20	0,4	13	0,3	9	0,3	42	0,3
Inflammatory disease in female pelvic organs	12	0,2	6	0,1	6	0,2	24	0,2
Anemia	3	0,1	5	0,1	5	0,2	13	0,1
Ear, nose, and throat infection	3	0,1	5	0,1	3	0,1	11	0,1
Total	5056	100	4658	100	2893	100	12607	100

Source: DATASUS. SUS Hospital Information System.

Regarding the gender of the elderly hospitalized for sensitive causes, there was a small higher prevalence for males (51.5%). Considering groups of cause by sex, the causes related to the cardiovascular system (angina, heart failure, and cerebrovascular diseases) were more prevalent for both sexes (61.9% for females and 65.7% for males), angina being the most prevalent cause for men and the third for women (Table 4).

Table 4. Number and proportion of hospitalizations for sensitive conditions, according to groups of sensitive individuals and age group, Uberaba - MG, 2009 to 2018.

Cause Groups	Female		Male		Total	
	N	%	N	%	N	%
Angina	1194	19,5	1672	25,8	2866	22,7
Cardiac insufficiency	1355	22,2	1299	20,0	2654	21,1
Cerebrovascular diseases	1237	20,2	1294	19,9	2531	20,1
Bacterial pneumonia	582	9,5	550	8,5	1132	9,0
Lung diseases	446	7,3	460	7,1	906	7,2
Kidney and urinary tract infection	405	6,6	386	5,9	791	6,3
Gastrointestinal ulcer	184	3,0	252	3,9	436	3,5
Diabetes mellitus	195	3,2	206	3,2	401	3,2
Skin infection	150	2,5	109	1,7	259	2,1
Nutritional deficiencies	156	2,6	35	0,5	191	1,5
Epilepsy	38	0,6	72	1,1	110	0,9
Diseases preventable by immunization	29	0,5	53	0,8	82	0,7
Hypertension	45	0,7	42	0,6	87	0,7
Infectious gastroenteritis	37	0,6	34	0,5	71	0,6
Asthma	27	0,4	15	0,2	42	0,3
Inflammatory disease in female pelvic organs	24	0,4	0	0,0	24	0,2
Anemia	6	0,1	7	0,1	13	0,1
Ear, nose, and throat infection	5	0,1	6	0,1	11	0,1
Total	6115	100,0	6492	100,0	100,0	100,0

Source: DATASUS. SUS Hospital Information System.

4. Discussion

The findings of the present study found a proportion of 20.4% of sensitive hospitalizations, with a decline in the proportion of HACSC in total hospitalizations between 2009 and 2016, showing a small growth in the 2017/2018 biennium. A study that evaluated the HACSC in the municipalities of the southern half of Rio Grande do Sul between 2000 and 2010 found a proportion of sensitive conditions in the elderly of 43.99%, more expressive results than those found in the present study (Santos et al. 2013).

A study by Rodrigues-Bastos et al. (2014) that aimed to analyze HACSC in the state of Minas Gerais in 2000 and 2010 identified a reduction in these hospitalizations with a drop of 20.75/10³ inhabitants.

Most studies are based on the hypothesis of a reduction in HACSC due to the increase in FHS population coverage, a fact that is contradictory to the scenario of this study when considering a reduction of 2.38 in FHS coverage, which corroborates the study findings. who assessed the risk of fallacious assessment in Itaboraí - RS, who identified a reduction in HACSC due to the closure of a tertiary hospital and did not improve the FHS coverage, which denotes the need to assess other factors when considering the effectiveness of the actions of primary services (Botelho and Portela 2017).

Although the present study did not consider the analysis of the temporal evolution of hospitalizations by trend analysis and other factors, the reduction of the proportion by descriptive analysis is an important result that may be related to the actions undertaken by the FHS related to promotion and prevention of sensitive conditions.

Considering the diagnoses of sensitive hospitalizations, it is pointed out that the three groups of most prevalent causes in the scenario and population of this study converge with other findings of studies conducted in Brazil (Santos et al. 2013; Ferreira et al. 2014; Marques et al. 2014; Rodrigues- Bastos et al. 2014).

The most representative causes of HACSC found in this study - angina, heart failure, and cerebrovascular diseases - accounted for approximately 64.0% of the total number of sensitive hospitalizations, which indicates that the actions taken by the FHS, with regard to health problems related to Circulatory System Diseases (CAD) need reassessment considering the high prevalence. A study carried

out in hospitals in Goiás on hospitalizations for sensitive cardiovascular conditions identified a prevalence of 17.2% (Batista et al. 2012), a result that is much lower than that found in this study and considering it to be a single municipality.

Angina is characterized by discomfort or pain located in the heart region, accompanied by the sensation of pressure, tightness, and burning above the chest, which can radiate to other parts of the body, due to the reduction of blood irrigation from the heart, being one of the conditions that covers the group of Acute Coronary Syndrome. A study that evaluated the profile of patients hospitalized with acute coronary syndromes identified 48.3% of hospitalizations diagnosed with angina (Silva et al. 2016).

Another important condition highlighted as one of the main causes of hospitalizations in this study was heart failure, considered one of the final stages in most cardiac pathologies characterized by the cardiovascular inability to guarantee oxygenation and tissue nutrition. In this study, it was more expressive in elderly octogenarians and female sex. Discrepant results were found in a study that analyzed the clinical profile of the elderly with heart failure in an emergency hospital in the city of Teresina, being more prevalent among males and aged 60 to 79 years (Nascimento et al. 2016).

Regarding the age variable, it is clear that the longer the age groups, the greater the proportion of ACSC, with greater representativeness for elderly octogenarians. A study that evaluated the quality of life and associated factors in elderly octogenarians in a city in the interior of Minas Gerais found a high number of self-reported morbidities and worse scores for quality of life in the physical and social relations domains of elderly residents in the urban area (Tavares et al. 2015). It is important to highlight phenomena such as urbanization, economic growth, and the various problems arising from the contemporary world that can influence the health status of the community's elderly, making it necessary to consider such aspects in public health policies aimed at this age group (Veras 2018).

When analyzing the gender variable, it was identified that there was a higher prevalence of hospitalization for males, with little difference for females (difference of 3.0%). Similar results were found in a study that evaluated HACSC in elderly residents in the state of Rio de Janeiro between 2000 and 2010 (Marques et al. 2014)

However, HACSC for female elderly women from the southern half of the country between 2000 to 2010 (Santos et al. 2013) and in the municipality of Ademar - SP between 2006 to 2008 (Rehem et al. 2013b) were more representative. Similar results were found in Guarulhos - SP between 2008 and 2012, where the age group from 60 to 69 years old had a higher incidence of ACSC, with an increment for the female sex (Melo and Egry 2014).

When analyzing the population of Korean individuals on the use of primary health care, hospitalizations, and multimorbidities, greater chances of hospitalizations were identified in individuals who did not have regular follow-ups by primary health care doctors (Chung et al. 2016). Another study carried out with elderly people in the municipality of Bagé - RS in 2008 on the influence of factors on hospitalization showed an association of increased hospitalizations with multimorbidities, being more evident in elderly people living in regions with FHS coverage but who had private health plans (Nunes et al. 2017).

A cohort study carried out in Tuscany, Italy, on the implementation of primary care based on chronic care showed greater chances of medical follow-up and lower risks of death from complications when they were followed up at the primary level in health care models based on chronic care (Ballo et al. 2018).

Another study that aimed to understand the evaluation of the primary level of hospitalized users by ACSC accompanied by a primary level with an implemented FHS showed that the primary level when the FHS is in place proved to be more qualified to guarantee longitudinality, focus on family structure and community orientation than health services without FHS teams (Sá et al. 2016). Such a result denotes the importance that a health model based on PHC, with a focus on the FHS, has in guaranteeing the effectiveness of its actions, user satisfaction, and reduction of preventable injuries due to sensitive conditions.

Furthermore, it is important to highlight as limitations of the study the fact that the ecological design does not allow establishing direct relationships to individuals since it works with aggregated data and the reliability of the data available using secondary public domain data.

5. Conclusions

This study allowed to describe the profile of HACSC of the elderly population in Uberaba - MG between 2009 and 2018 and verify that, in general, the proportion of HACSC decreased in the period between 2009 and 2016, with groups of causes related to the cardiovascular system (heart failure, angina, and cerebrovascular diseases), the proportion of sensitive hospitalizations for elderly and long-lived (octogenarians) males.

Ecological studies with secondary data are of fundamental importance in the analysis of the health conditions of the populations and in the direction of the health actions undertaken, especially those carried out by the PHC. It is worth highlighting the importance of carrying out other analyzes, such as the temporal evolution through the trend analysis and the relationship between HACSC and the number of FHS teams, analyzes that are beyond the scope of the present study.

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