Sensitive hospitalizations to primary care and care in the health care network

Internações sensíveis à atenção primária e o cuidado na rede assistencial em saúde

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Objective: to check the profile of sensitive causes hospitalizations for primary care. **Methods**: this is an ecological, epidemiological study. Data was collected in the Hospital Information System at the Department of Health System Information, grouped according to the admissions list for Sensitive to Primary Causes of Health System. **Results**: there were 227,014 hospitalizations, 25.8% of them were sensitive to Primary care. The illnesses which caused sensitive admissions were pneumonia (n=19,832; 33.7%), heart failure (n=6,688, 11.3%), and gastroenteritis (n=6,287, 10.7%). **Conclusion**: sensitive hospitalizations for primary care have decreasing historical trend in the study area. Primary care services, with guidelines and principles, well conducted could minimize the risk of exacerbation of chronic conditions and also endorse lower rates of infection transmitted diseases.
Descriptors: Primary Health Care; Public Health Policy; Health Services Evaluation; Health Promotion.

Objetivo: verificar o perfil das internações por causas sensíveis à atenção primária. **Métodos:** estudo epidemiológico ecológico. Dados coletados no Sistema de Informações Hospitalares no Departamento de Informática do Sistema Único de Saúde, agrupados de acordo com a lista de Internações por Causas Sensíveis à Atenção Primária do Sistema Único de Saúde. **Resultados:** ocorreram 227.014 internações, 25,8% destas eram sensíveis à Atenção Primária. As doenças que mais causaram internações sensíveis foram pneumonias (n=19.832; 33,7%), insuficiência cardíaca (n=6.688; 11,3%), e gastroenterites (n=6.287; 10,7%). **Conclusão:** as internações sensíveis à Atenção Primária apresentam tendência histórica decrescente no território estudado. Serviços de Atenção Primária, com diretrizes e princípios bem conduzidos, poderiam minimizar o risco de agudização das condições crônicas e também avalizar menores taxas de infecção por doenças transmissíveis.
Descritores: Atenção Primária à Saúde; Políticas Públicas de Saúde; Avaliação de Serviços de Saúde; Promoção da Saúde.

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Introduction

The Hospitalization by Sensitive Conditions for Primary Care correspond to a health indicator that can be used in the evaluation of primary health care, related to hospitalizations for preventable causes for basic services of health network if they were affordable and resolute[1].

The concept of Hospitalization by Sensitive Conditions to Primary Care, internationally called Ambulatory Care - Sensitive Conditions was developed in the late 1980s[1] to refer to potentially preventable hospitalizations, as an indirect reflection of problems with access and effectiveness of primary care. In Brazil, the Ministry of Health Care, Ministry of Health of Brazil by a Decree[2] published the Brazilian List of Sensitive Conditions for Hospitalization in Primary Care that remains in force to date and sets groups of hospitalization and diagnosis causes, according to the Tenth Revision of the International Classification of Diseases[3].

Since then, research[4-5] using data from Sensitive Conditions Hospitalizations for Primary Care have been carried out, showing the relationship between the characteristics of health systems, especially with the primary care policy.

According to the current National Policy on Primary Care[6] within the Health Care Networks, the function of primary health care is to be the resolute care coordinator and the base network. However, the worsening of chronic conditions and some hospital procedures have been reported to be associated with the lack of effective monitoring and quality of services offered in Primary Health Care. In a recent meta-analysis of 39 cross-sectional and cohort studies[7] held to verify the geographical variation in admission rates of Hospitalizations for Ambulatory Care Sensitive Conditions, and the length of stay in the hospital, the variations found may result from the variability of the quality of primary care. Then it was suggested that health policy makers should introduce initiatives to improve access and quality to primary care.

Brazilian service of Primary Health Care is offered primarily in the Family Health Strategy, implemented in Brazil to propose a new health production model, following the singularities of the area, the assisted population needs and consequently, promoting shorter hospital stays[6].

One of the targeting strategies of the primary health care services in Brazil was the establishment of criteria to classify hospitalizations in "sensitive conditions to primary care" to work as a guiding tool for hospital activities[2]. The Ministry of Health of Brazil establishes that the Brazilian list of Sensitive Conditions Hospitalization for Primary Care should be used as an evaluation tool for primary health care and the use of hospital care[2,6]. Thus, there is a path to direct care practices of members of the primary healthcare teams to know the main causes of hospital admissions.

The Sensitive Conditions for Primary Care Hospitalization in southern Brazil are more common in females, the elderly and they have decreased as well as their costs - following the reduction of costs to the total admissions. Moreover, higher rates of Sensitive Conditions Hospitalizations for Primary Care were observed in southern Brazil, in groups of anemia, epilepsy, urinary tract infections, gastrointestinal ulcer. However, hospitalization rates for lung disease, angina, heart failure and cerebral vascular diseases, diabetes mellitus are very high compared to other regions of the country[7-8]. It is appropriate to reduce avoidable hospitalizations for expansion of primary care in the region and the incorporation of human resources in the basic network.

The consolidation of local health systems embraced the solidification of the principles and guidelines of Primary health Care, so it is resolute to the enrolled population and minimized avoidable hospitalizations. Thus, it is expected that in locations where primary care is effective and patients have access, the tertiary level of health care networks receive only the most serious cases of clinical conditions and

inevitable for hospitalization[9]. Thus, this study was developed to check the profile of sensitive causes hospitalizations for primary care.

Methods

This is an epidemiological study of ecological type on the Hospitalization by Sensitive Conditions to Primary Care in the past decade (2000 to 2010) in the city of Ponta Grossa, Paraná, Brazil. The time series of the last decade was used because, at the time of data collection, it was the period with complete data available in the database searched, and the study was designed to make the diagnosis of admissions to coincide with the implementation period, development and expansion of the Family Health Strategy teams in the city studied.

The public data were collected from the hospital morbidity information from the Department of the Unified Health System[10] in 2013 as part of the research project entitled "Sensitive Causes Hospitalizations for Primary Care in Paraná State" that began in 2011 and ended in 2014. Throughout this period, the data were collected to meet the initial objectives of the research. The Sensitive Hospitalizations for Primary Care were classified and grouped according to the conditions laid out in the Ordinance[2]. The population data for each year (2000-2010) were also collected in the Department of the Unified Health System[10].

It is noteworthy that some morbidities of the respiratory tract arranged in the Ordinance mentioned[2] were not available separately in the Department of Informatics of the Unified Health System and were analyzed together.

Data were described by absolute number, percentage and average admissions for all causes and Sensitive Conditions to Primary Care. The analysis of central tendency and their confidence intervals (CI) 95.0% were performed in the statistical package Stata®, version 12.

Two health indicators were built: 1) Proportion of Sensitive Conditions Hospitalizations for Primary Care (=Proportion of Sensitive Conditions Hospitalizations for Primary Care according to the cause, a total of Sensitive Conditions Hospitalization for Primary and 2) Coefficient of Sensitive Conditions hospitalizations for Primary Care (=number of Sensitive Conditions hospitalizations for Primary Care in the year/ municipal population in the same period x 10,000).

The study complied with the formal requirements contained in the national and international regulatory standards for research involving human beings.

Results

During 2000 to 2010 there were 227,014 hospitalizations in the city of Ponta Grossa, Brazil. Of them, more than a quarter was Sensitive Hospitalizations for Primary Care (fp=25.8%).

During the study period, the highest and lowest absolute number of Sensitive Conditions hospitalizations for Primary Care were respectively in 2003 (n=6,308) and 2008 (n=4,383). Regarding the average of Hospitalization for Sensitive Conditions to Primary Care, 2002 and 2003 had higher average ($\bar{x}_{2002}$=230.4 [95.0% CI: 63.2-397.6]; $\bar{x}_{2003}$=252.3 [95.0% CI: 48.4-456.1]).

The three main causes (Table 1), of Hospitalization for Sensitive Conditions Primary during the study period (2000 to 2010) in descending order were: pneumonia (fp=33.7%), heart failure (fp=11.3%) and infectious gastroenteritis and complications (volume depletion, intestinal bacterial infectious diseases, viral and protozoal/International Classification of diseases, 10th review: E86; A00-A09) (fp=10.7%).

The percentage of hospitalizations for pneumonia in all years studied exceeded 30.0% of total admissions. As this cause stood out among the others, the most frequent age groups were analyzed to raise possible determinant factors for the occurrence that could be related to this demographic condition. It was observed that in the age groups <1 year, 1-4 years old and >60 years old, the highest hospitalization rates

for pneumonia were found with 24.6%, 33.2% and 16.5%, respectively of all hospitalizations for pneumonia. The percentage difference between the year generating more hospitalizations for heart failure (2000) and fewer hospital admissions for this cause (2009) did not exceed 4.0%.

Frequent diseases in the Brazilian population, such as diabetes mellitus and hypertension (Table 1), were also causes of Hospitalization for Sensitive Conditions to Primary Care in Ponta Grossa, in the period considered (respectively, 2,580 and 2,261 cases of hospitalization), but with lower frequency when compared to the three main above. The annual percentages were below 6.0% of total admissions in both diseases. The ten most common causes of hospital admissions for Sensitive Conditions to Primary Care accounted for more than 80.0% of all for Sensitive Conditions Hospi-

talizations for Primary Care in the city over the period.

Otherwise, diseases related to prenatal and antepartum led to fewer hospitalizations than other preventable causes, not being found in all years studied, or when data of the municipality were found, they were small amounts about the total hospitalizations.

The group of inflammatory diseases of female pelvic organs and gastrointestinal ulcers were preventable morbidities that caused minor hospitalizations (below 1.0% of total admissions in the whole period). It was observed that the group of Sensitive Conditions Hospitalizations for Primary Care, represented by asthma and the group of gastroenteritis, decreased in the last decade. However, the groups represented by anemia and nutritional deficiencies showed increasing values.

Table 1 - Number, proportions, annual averages and confidence intervals 95.0% for the ten most common causes of hospital admissions for Causes Sensitive to Primary Care

Causes	n (%)	CI95% of proportion	Average (standard deviation)	CI95% Average
Pneumonias	19.832 (33.7)	[32.2-35.2]	1802.9 (78.6)	[1627.7-1978.1]
Cardiac insufficiency	6.688 (11.3)	[10.4-12.3]	608 (29.7)	[541.7-674.2]
Infectious gastroenteritis and complications	6.287 (10.7)	[7.6-13.5]	571.5 (77.8)	[397.9-745.0]
Emphysema and other chronic obstructive pulmonary diseases	4.145 (7.0)	[6.1-7.8]	376.8 (26.8)	[317.0-436.5]
Cerebrovascular diseases	3.309 (5.6)	[5.0-6.3]	300.8 (15.9)	[265.3-336.3]
Asthma	2.906 (4.9)	[3.2-6.4]	264.1 (41.2)	[172.3-356.0]
Nephritis	2.802 (4.7)	[4.2-5.4]	254.7 (10.8)	[230.6-278.7]
Diabetes mellitus	2.580 (4.3)	[3.5-5.3]	234.5 (17.9)	[194.5-274.5]
Arterial hypertension	2.261 (3.8)	[3.3-4.3]	205.5 (11.9)	[178.8-232.2]
Protein calorie malnutrition and kwashiorkor	1.822 (3.1)	[2.0-4.3]	165.6 (26.1)	[107.4; 223.8]
Total	52.632 (100.0)	-	4784.727 (562.01)	[4407.16-5162.29]

*CI=Confidence interval

The proportion of Sensitive Conditions Hospitalizations for Primary Care at the beginning of the last decade was 24.6%, and at the end of the decade reduced to 21.0%. Between 2000 and 2010, the proportion of causes sensitive hospitalizations for primary care decreased by 2.7% (Table 2).

When comparing Hospitalization for Sensitive Conditions to Primary Care with the local population, it is observed that the number of hospitalizations per 10,000 population decreased from 2004 (Table 2), except 2007.

Table 2 - Proportion (%) and coefficient of sensitive causes hospitalizations (per 10,000 population) for Primary Health Care

Year	Proportion of sensitive causes hospitalizations for primary care *	Coefficient of sensitive causes hospitalizations for primary care **
2000	24.6	199.8
2001	24.3	191.6
2002	27.5	203.9
2003	30.1	220.0
2004	28.7	190.3
2005	28.2	176.0
2006	26.1	166.3
2007	29.2	198.3
2008	23.6	140.8
2009	21.0	141.8
2010	21.9	161.1

*Number of sensitive causes hospitalizations for primary care in the year/ total hospitalizations in the same period x 100; **Number of sensitive causes hospitalizations for primary care in the year/municipality's population in the same period x 10,000[10]

Discussion

Being an ecological study, the aggregate measures calculated in this study (average, proportion, and ratio), have the unit of analysis the group. Therefore, it cannot be concluded from the results found that any reduction in sensitive hospitalizations for primary care at the individual level, or prevalent diseases and disorders in primary care (such as diabetes, hypertension, asthma and complications during prenatal/pre-delivery) have ceased to generate hospitalizations for all individuals.

Another limitation of the study is the use of secondary data, dependent on the quantity and quality of information available from the Hospital Information System. However, this system reflects all hospital authorizations for services paid by the Unified Health System, which account for more than 75.0% of the national hospital care. Finally, local coverage of the results is cited as a weakness of the research. However, the findings are extremely important for local health interventions and may be useful in strategic planning for qualification of same-sized Primary Care in the municipalities in Brazil.

For the practical application, the results of this study reinforce the importance of efforts in the country to regionalize and territorialize health care to know and care for people close to their daily life and longitudinally. Knowing the main of sensitive causes hospitalizations for primary care favors the understanding of the weaknesses and strengths of clinical actions, and health management, reducing avoidable hospitalizations.

The largest absolute and average values of Sensitive Conditions Hospitalization for Primary Care in the city studied dating from the beginning accompanied historical series and, later, there was a decrease. This fact contributes to the implementation of the Family Health Strategy in the territory, which took place from 2002 and ended in the last decade with approximately 40.0% of the population covered by primary health care. It is noteworthy smaller Rates of Sensitive Conditions Hospitalizations for Primary Care in areas with greater coverage of the Family Health Strategy and higher values of admissions in regions with the highest number of private hospital beds[11].

Home visits, educational activities based on horizontality care, programmed actions (immunization, child care, glycemic control and blood pressure), patients´ ascription and assistance based on social, economic and cultural realities of the patients can mi-

nimize the risk of worsening of chronic conditions and also endorse lower rates of infection transmitted diseases. It is suggested, though not conclusive about the association between primary care services and hospital admissions for conditions sensitive, that when care resources are available, and there is access to primary care, there is also the admissions reduction of preventable conditions, as verified in a systematic review on the subject[12].

Despite the data suggest that primary care has contributed to reduction of hospitalizations and sensitive hospitalizations coefficients very similar to the national and state results[13-14] were obtained in 2000 and 2010, the results of this study that Sensitive Conditions Hospitalizations for Primary Care accounted for 25.8% of admissions in the last decade, and the ten leading causes accounted for more than 80.0% of all avoidable hospitalizations. This data is evidence to direct efforts and resources in promoting the health of healthy subjects, and prevention or treatment of these major diseases that have caused preventable hospitalizations.

Moreover, it is considered that population aging is reflected in the epidemiological transition. Although the study did not consider the most frequent age sensitive admission to each disease, the disease profile, the main sensitive causes hospitalizations displaying in this study is associated with older people[15]. Thus, it is a priority to longitudinal and programmatic intervention on chronic diseases among the elderly, and the fight for these determinants among young adults.

Thus, the actions of Primary Care should be guided by the expansion of immunization against respiratory diseases, reducing smoking, healthy eating, proper hand washing and food, hygiene, physical activity practices and adherence to treatment and disease control chronic proposed by the Family Health Strategy.

For diseases such as hypertension and diabetes mellitus, the HiperDia program has shown positive results, and patients retain control of these diseases in their basic health unit without accessing the hospital service[16]. The values found in this study may reflect the success of the program for many subjects, but also realize is that cerebral vascular disease and heart failure associated with hypertension and diabetes, are also common causes of preventable hospitalizations. Thus, primary care teams can reflect on their practices directed to the most complex cases and consider the use of complex case management tools, such as the use of clinical protocols to classify subjects into the Hiperdia program, the development of therapeutic projects unique for cases classified as having high risk, and case management based on clinical guidelines and rules of the promotion of autonomy and empowerment of the subjects.

The three causes for the largest proportion of sensitive hospitalizations in this study are similar to another study[14], in which the diseases that caused more hospitalizations were infectious gastroenteritis and complications, hospitalizations for heart failure and asthma.

Pneumonia was the leading sensitive cause hospitalizations, and this occurrence may be determined by the environment. Ponta Grossa is a municipality of subtropical climate, so its average temperatures do not usually exceed 22ºC, with a winter bringing frost and records with very low temperatures[17]. The social grouping, low temperatures, and low relative humidity during the winter facilitate the transmission of the causative agents of influenza and pneumonia[18], especially among the less immunocompetent subjects, such as children under five and the elderly with more than 60 years old. Another explanation would be that one of the major protective factors against pneumonia, immunization, was inserted in the basic calendar of Brazilian vaccination by pneumococcal 10-valent, only in 2010 and is intended for vaccine prevention of children.

It is suggested that managers and health professionals reflect on their teams that good quality performance in primary care may be associated

with decreased Hospitalization rates for Sensitive Conditions to Primary Care, lower costs (financial and emotional) and expansion of bonds with the community. The care offered in primary care may be more promising for curing and prolonging life than the other levels of health care. Other research on the subject could help to confirm the causes of Hospitalization for Sensitive Conditions to Primary Care and produce new inferences that contribute to the care and management of health services.

Conclusion

The hospitalizations profile sensitive to primary health care in the study area was decreasing, reducing hospitalizations for high disease prevalence in Brazil, but with avoidable hospitalizations maintenance for cardiovascular and respiratory diseases.

Collaborations

Borges PKO and Schawb PM contributed to the conception and project, analysis and interpretation of data. Blanski CR, Floriano LSM, Lopes BG and Muller EV contributed to the writing of the article, relevant critical review of the intellectual content and final approval of the version to be published.

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