

# Hospital Admissions For Drugs: An Analysis Of Santa Catarina, Brazil

Alexandra Crsipim Boing

Federal University of Santa Catarina, Brazil

**Abstract:** Describe the hospital for drugs in the state of Santa Catarina. A descriptive study of hospital admissions due to drugs occurred in 2009 in the state of Santa Catarina. Investigated the hospital by describing drugs by sex, age, length of hospital stays and months of the year, and high death rate and costs generated by that type of hospitalization. The information was obtained through the Hospital Information System (SIH-SUS). We identified 10,180 cases of hospitalization for drug-related events in 2009 in Santa Catarina. These hospitalizations were higher among women, the elderly and with an average days of stay in hospital of 7.62 days. Among these admissions 2.5% resulted in death were higher among the elderly of 70-79 years. The average cost generated by these admissions was R\$ 651.12. The results show that there is a significant rate of hospitalization for injuries caused by medications. and monitoring studies are needed to produce knowledge to promote strategies for the rational use of medicines and skills of professionals working in this perspective.

**Keywords:** hospital admission, pharmacoepidemiology, adverse events for drugs

## I. INTRODUCTION

In Brazil, drug use studies (EUM) increased between the late 1980s and the mid 1990s (Castro and Simões, 1995). Studies on prescription quality, adverse effects, pharmacovigilance, profile of drug use, factors influencing prescription, consumption of psychoactive drugs, antimicrobials, as well as consumption of drugs by pregnant women, children and the elderly, and self-medication profile have been carried out in the country. Such an increase indicates the great relevance that the subject assumed in the scientific field, since the drug became not only a therapeutic agent but a potentially problematic element, as Laporte and Tagnoni (1989) point out, since their use does not prevent effects from occurring undesirable effects, as well as their lack and / or their irrationality of use generate adverse effects of great importance for individuals.

In 2002 the meta-analysis was conducted on hospital admissions due to drug-related problems and it was found that the prevalence of hospitalizations varied from 3% to 9% and that 50% of these hospitalizations could be avoided by the rational use of medicines Winterstein et al., 2002). According

to Hepler (2000), the main causes of drug-related morbidity are related to inadequate prescriptions, adverse reactions, lack of access to medication, overdose, underdosing and medication errors that have a direct impact on the health status of the health spending. In 2007, in Brazil, drugs were the main cause of intoxication among the events identified by the state toxicological information centers (30.56% of the total), causing 91 deaths in this period (SINITOX, 2009).

Although the First World Conference on the Rational Use of Medicines took place more than two decades ago, the consolidation of a panorama far removed from the one advocated at that time has taken place. According to Brundtland (1999), 15% of the world population consumes 90% of pharmaceutical production, 50% of medicines are incorrectly prescribed and used and 75% of antibiotic prescriptions are erroneous. In addition, the Rational Use of Drugs could prevent most hospital admissions (Winterstein et al., 2002).

Studies investigating the magnitude of hospital admissions for drugs are scarce in Brazil. The objective of the present study was to describe the hospital admissions for drugs of the population of Santa Catarina, Brazil, in 2009.

II. METHODS

This is a descriptive study of hospital admissions for medicines occurred in 2009 in the state of Santa Catarina.

The information was obtained through the Hospital Information System (SIH-SUS), which concentrates data on hospital admissions under the Unified Health System (SUS). These data are made available in aggregate by municipality by the Department of Informatics of the Ministry of Health, DATASUS.

The variables used to describe hospital admissions for drugs were divided into dependent and independent variables. The International Classification of Diseases (ICD-10) adverse effects of drugs, drugs, and biological substances for therapeutic purposes were considered as the main variables. This category is composed of the following codes: Y40; Y41; Y42; Y43; Y44; Y45; Y46; Y47; Y48; Y49; Y50; Y51; Y52; Y53; Y54; Y55; Y56; Y57; Y58; Y59. In addition to these codes, the following codes are included: poisonings, sequelae of intoxications caused by medicines; errors in prescription or administration; intentional self-harm; poisonings in which the intention is indeterminate; accidental poisoning; complications resulting from infusion, transfusion or therapeutic injection, as used by Rozenfeld (2007). The author has called the set of these Drug Affected Codes (APM) codes. The independent variables used were gender, age group, hospital stay and month of the year. A análise de dados foi realizada no pacote estatístico Stata 9. Foi considerada unidade de análise a internação hospitalar. Para o cálculo de taxa de internações hospitalares por medicamentos foi utilizado o número total de internações hospitalares por medicamentos do período dividido pelo número total de internações hospitalares do mesmo período. As internações hospitalares por medicamentos foram analisados segundo o sexo, faixa etária, dias de permanência no hospital e mês de ocorrência.

III. RESULTS

The total number of hospitalizations in 2009 in Santa Catarina was 398,315. Analyzing only hospital admissions by main diagnosis, those related to diseases caused by drugs amounted to 10,180. Thus, hospital admission rate proportional to drug-related illnesses was 25.6 per 1,000 hospitalizations, being higher among women (53.1%) and among the elderly (37.4%) (Table 1).

51-60	1,817 (17.8)	4.60
61-98	3,805 (37.4)	9.60
<b>TOTAL</b>	<b>10,180 (100.0)</b>	<b>25.6</b>

Table 1: Description of hospitalizations according to demographic variables and hospitalization rates per drug. Santa Catarina, Brazil, 2009

It was verified that the average age of the hospitalized users was 51.5 years (SD = 20.4 years), with a minimum age of 0 and a maximum of 98 years. The analysis of only the elderly (age equal to 60 years and over) showed that the number of hospitalizations was 4,011, corresponding to 39% of hospitalizations for the reason analyzed. These hospitalizations were higher among the elderly between 60 and 79 years (Figure 1).

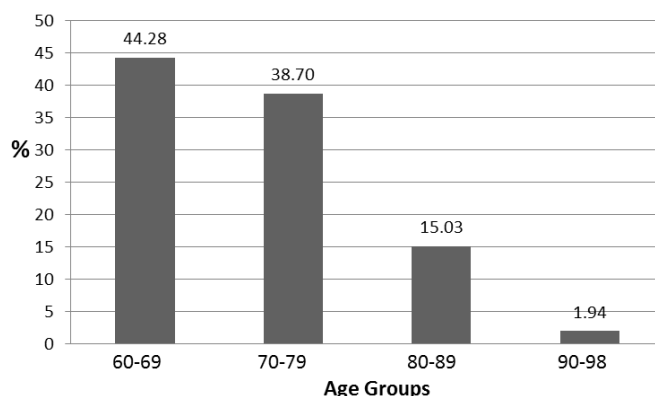


Figure 1: Distribution of hospital admissions for medication among elderly hospitalized in 2009, Santa Catarina, Brazil, 2009

The hospitalizations did not vary much between the months of the year, with the average number of hospitalizations per month equal to 8.3% of the annual total. The maximum percentage of hospitalizations was observed in March, with 1000 admissions (9.8%), and in February, with 790 (7.8%) (Figure 2).

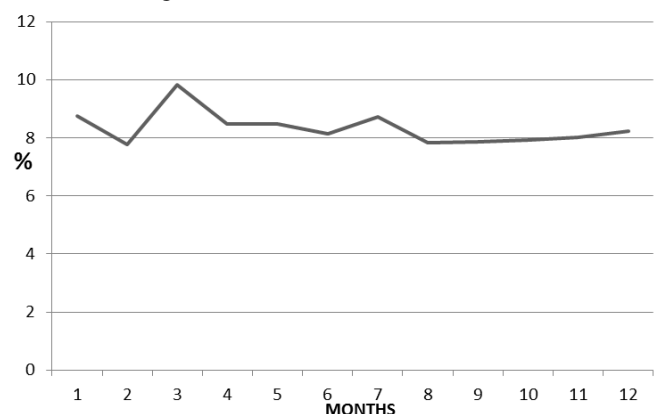


Figure 2: Distribution of hospital admissions for medicines according to the months of 2009, Santa Catarina, Brazil, 2009

Among hospitalizations, the mean number of days of stay was 7.62 days (SD = 8.33 days), with an average cost of R \$ 651.12. Of these hospitalizations, 97.5% resulted in a high and 2.5% in deaths. Among these deaths, 41.0% occurred among the elderly aged 70-79 years (Figure 3).

Variable	Sample N (%)	Hospital admission rate for diseases caused by medication (per 1,000 hospitalizations)
<b>Sex</b>		
Male	4,778 (46.9)	12.0
Female	5,402 (53.1)	13.6
<b>Age (years)</b>		
0-10	214 (2.1)	0.53
11-20	647 (6.4)	1.62
21-30	1,077 (10.6)	2.70
31-40	1,148 (11.3)	2.90
41-50	1,472 (14.5)	3.70

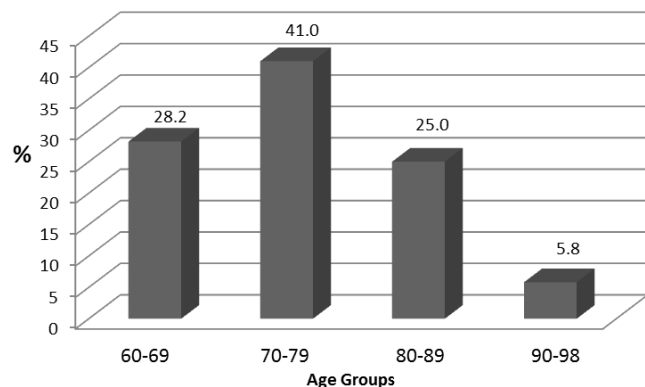


Figure 3: Distribution of drug deaths among the elderly hospitalized for drug - related illnesses, Santa Catarina, Brazil, 2009

#### IV. DISCUSSION

The present study described hospital admissions for medications according to sex, age group, month of the year and days of hospital stay. An admission rate of 25.6 was observed for every 1,000 hospitalizations. These hospitalizations were higher among the women, the elderly and with an average hospital stay of 7.62 days.

Among the limitations of the study, it should be highlighted the coverage of only hospital admissions performed within the scope of the Unified Health System. In addition to this factor, the proportions obtained through the SIH-SUS data may be influenced by the number of multiple hospitalizations of the same patient and by filling quality. But despite its limitations to SIH-SUS, like all the country's Health Information Systems (SIS), it has advanced a lot in terms of the quality of records.

The hospitalization rate in the present study was 25.6 / 1000 admissions. These values are lower than those found in the United States and France, 65 / 1,000 and 47 / 1,000 (Classen et al., 1992; Lagnaoui et al., 2000) and higher than those found in the state of Rio de Janeiro between 1999 and 2000 (1.8 / 1000). These differences may have been due to differences in records, monitoring, qualification of professionals and quality of records in the country. A maioria das internações ocorreu entre as mulheres e entre os mais idosos, o que pode ser justificado em parte pela maior utilização de medicamentos entre as mulheres e nos indivíduos com maior idade (Carvalho *et al*, 2005; Hovstadius et al., 2009) e podem ser explicadas pela maior preocupação que as mulheres apresentam com a sua saúde e a maior utilização dos serviços de saúde nos indivíduos de sexo feminino (Fleith et al., 2008). Maior utilização de serviços de saúde, maior número de doenças crônicas e seqüelas que acompanham o avanço da idade são fatores que podem contribuir para o maior uso de medicamentos dentre os indivíduos mais velhos (Coelho et al., 2004).

The mean number of days of hospitalization was 7.62 days. A study conducted by Rozenfeld in 2007 in Rio de Janeiro identified an average of 5.0 days for intoxications and 26.5 days for adverse effects. The data regarding the hospital

discharge rate was large similar to other studies conducted (Rozenfeld, 2007).

Among the months of admission by APM, these were very similar, showing no trend. Deaths were concentrated among the elderly in the 70-79 age group, which may be associated with a greater number of chronic diseases and greater complications in health status.

Still in the country, there are few studies that deal with morbidity and mortality from APM and pharmacovigilance studies, and studies on the monitoring of drug-related illnesses are needed to be used as a source of information for the dissemination of the importance of this monitoring, as well as the promotion of Use Rationale of Medications and higher qualification of the professionals involved in this process.

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