

Amputation surgeries due to external causes performed in public hospitals in Santa Catarina, Brazil

Cirurgias de amputação por causas externas realizadas em hospitais públicos de Santa Catarina, Brasil

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ABSTRACT

Objective: In order to characterize the profile of lower limb amputation surgeries by external cause, performed in public hospitals in the state of Santa Catarina. **Method:** This descriptive, epidemiological and hospital based study analyzed hospital admission permits (AIH) (N= 4158) in between 2008-2014. **Results:** There has been a prevalence of male population (79,1%), age group between 18 and 29 years (17,7%). The most incident form of amputation was by partial or complete traumatic injury with involvement of a finger. The three most affected counties were Chapecó, Criciúma and Brusque. There has been a decrease in the number of amputations mainly in the last four years. **Conclusion:** Despite this fact, amputations are a globally recognized public health problem. Epidemiological follow-up the AIH's translates as an indicator to monitor and trigger improvement actions of specialized assistance to amputated patients with a view to prevention, organization of services, and training of multi professional teams.

Keywords: Amputation, External Causes, Hospitalization, Information Systems

RESUMO

Objetivo: Caracterizar o perfil das cirurgias de amputação de membros inferiores por causa externa, realizadas em hospitais públicos do estado de Santa Catarina. **Método:** Estudo descritivo, epidemiológico e de base hospitalar analisou as permissões de internação hospitalar (AIH) (N= 4158) no período de 2008-2014. **Resultados:** Houve predomínio da população masculina (79,1%), faixa etária entre 18 e 29 anos (17,7%). A forma de amputação mais incidente foi por lesão traumática parcial ou completa com envolvimento de um dedo. Os três municípios mais afetados foram Chapecó, Criciúma e Brusque. Houve uma diminuição no número de amputações principalmente nos últimos quatro anos. Apesar disso, as amputações são um problema de saúde pública reconhecido mundialmente. **Conclusão:** O acompanhamento epidemiológico por meio das AIH's se traduz como um indicador para monitorar e desencadear ações de melhoria da assistência especializada ao paciente amputado com vistas à prevenção, organização dos serviços e treinamento de equipes multiprofissionais.

Palavras-chaves: Amputação, Causas Externas, Hospitalização, Sistemas de Informação

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INTRODUCTION

Studies dealing with the incidence of amputations are relevant, but there is a shortage of works within this theme.¹ According to the Hospital Information System of the Unified Health System (SIHSUS) in 2011, the biggest cause of limb amputation was due to external cause, representing 33,1% of total amputations in Brazil.² Are considered to be external causes amputations: those from traumatic injuries and/or exposed fractures.³

In the public hospitals of the Great Florianópolis, references in orthopedic/traumatology surgery, a study³ evidenced that external causes are the main reasons for limb amputation. The study of Borges et al.³ revealed that the traumatic amputations within exposed fractures have been recorded in the youngest portion of the population, whose age recorded were lower than 35 years and the gender male predominant. Traffic accidents are those who mostly represent external causes with emphasis on motorcycle accidents considered the more relevant at the given county.³

Accidents at work can also cause amputations due to external causes and, usually affect the joints of the upper limbs. Accident and disease costs originated from work can cost to Brazil annually, BRL 71 billion.⁴

According to the Accident and Violence Surveillance System (Sistema de Vigilância de Acidentes e Violências - VIVA), between the years of 2008 and 2011, 33.3% of the attendances resulting from external causes from all over the country were due to work accidents.⁵

In addition to causing great biopsychosocial impact on individuals and family members, there is, in that context, a socioeconomic loss of the country, because this population should be economically active.³

The justification of this theme is based on the relevance of the problem investigated by the extension project of the Santa Catarina State University, located at the Health and Sport Sciences Center, entitled Multidisciplinary Rehabilitation in Amputees. Through the Universal Notice for Development *Conselho Nacional de Desenvolvimento Científico e Tecnológico* (CNPq), since 2014, the project set out to developing a macro research aiming at building and implementing a proposal to promote the health of amputees in order to meet the National Guidelines of the Ministry of Health, beginning at the public hospitals of the Greater Florianópolis.

Assuming that the epidemiological survey of amputations due to external causes can provide us with an overview of this problem in our state, the study is innovative and seeks to turn possible, based on the data collected, the implementation of strategies for prevention as well as assistance, in the event of accidents resulting in amputation.

OBJECTIVE

The main goal of this article is to characterize the epidemiological profile of external causes amputation surgeries performed in public hospitals of the Santa Catarina State between 2008-2014.

METHOD

This is a descriptive epidemiological study based on hospital. Secondary data have been analyzed, originated from

the Hospital Information System of the Unified Health System (SIH/SUS), provided by the State Department of Health. This database contemplates the Hospital Admission Authorization (AIH) of persons submitted to amputation financed by SUS in the State of Santa Catarina from 2008 to 2014.

Amputation surgeries from external causes of both genders have been included, for all levels of amputation and all ages. They have been classified as an external cause: etiologies arising from an exposed fracture after traumatic injury. After approval of the research by the CAEE research ethics committee 32282213.1.0000.0118, the sample has been extracted from the HIS database of SUS.

The period made available for consultation of the incidence of amputations is valid from 2008 through to 2014, as it was the time interval where the data have been digitized and arranged at the State Department of Health (Secretaria Estadual de Saúde - SES). From within the establishment of the period, it has been determined that for the survey of the characteristics of these surgeries, we would use this same period in the retrieval within the Mortality Information System (SIM in Portuguese) at SC.

To describe the outcome, data have been tabulated using Microsoft Excel and statistically analyzed by the Statistical Package for Social Sciences (SPSS) software, version 20.0. From within these programs the absolute frequencies and percentages of the variables have been generated, such as: gender, age, type of amputation surgery by the International Disease Classification (CID in Portuguese),² month, year, hospital that performed the surgery and the hospital's micro region.

RESULTS

Data about Hospital Admission Authorization (HAA) of public hospitals in our state revealed that over the last seven years there have been 4158 cases of amputation surgeries distributed in 20 micro regions.

Males were more frequent, with 3289 amputations against 869 amputations in the females. It can be seen from Table 1 below that the most prevalent age group was 18 to 29 years of age, followed by the population between 40 and 49 years.

Table 1. Distribution of amputation incidence by age group and year

	2008	2009	2010	2011	2012	2013	2014	Total
18 to 29 years old	136	116	120	106	97	91	72	738
30 to 39 years old	120	103	104	78	67	69	59	600
40 to 49 years old	102	125	121	77	84	114	75	698
50 to 59 years old	82	125	113	101	89	94	80	684
60 to 69 years old	75	89	85	76	73	65	61	524
70 years old or older	85	73	79	68	52	59	45	461

According to Table 2, upper limb-related traumatic amputations are more frequent, totaling 51.7% of the sample. The most frequent ICD was S68.1, which corresponds to partial or total amputation of the fingers, with 1153 amputations, totaling 27.7%, followed by ICD S68.2 which includes complete or partial traumatic amputations or removal of two or more fingers, with a total of 305 amputations and totaling 7.3% of the sample. Traumatic amputation related to lower limbs has had ICD S98.3 as the most expressive, representing the

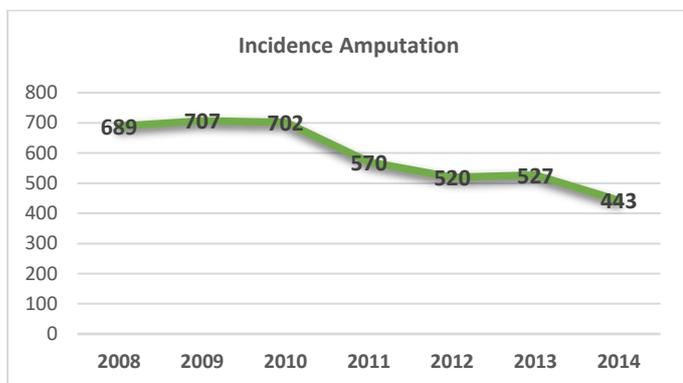
traumatic amputations of other parts of the feet, with 359 amputations, equivalent to 8.6% of the sample.

Table 2. Most frequent incidences for amputation surgeries in the state of Santa Catarina, Brazil

Classification	Amputations	
	N	%
Traumatic amputation related to upper limbs	2149	51.7%
Traumatic amputation related to the lower limbs	1181	28.4%
Other	828	19.9%
Total	4158	100%

The Chart 1 below shows the total number of amputation surgeries performed in the whole state of Santa Catarina from 2008 to 2014. There is a decrease in the number of amputations mainly in the last four years, with 2009 being the year of most incidence totaling 707 surgeries.

Chart 1. Incidence above 100 amputation surgeries by ICD and municipality in the State of Santa Catarina, Brazil



The micro regions that contain state hospitals with the highest incidence of amputation by external trauma (over 100 amputation surgeries performed in the period) are described in Table 3 and are located in the cities of: Chapecó, Criciúma, Brusque, Lages and São José respectively. For each hospital, the five most incident ICDs and the total amputation surgeries performed between 2008 and 2014 were pointed out.

It is observed that the hospital with the highest incidence of amputations in the state throughout the years serves the Chapecó micro region, totaling 419 amputation surgeries and representing 10% of total amputations in the state.

DISCUSSION

This research considered as external cause amputations those originating from exposed fracture followed by traumatic injury, however, for this etiology we observed that the registrations from the AIH's do not specify the reason for the external trauma such as due to a traffic accident, agricultural machine accident, explosives, fire or white arms. Thus, we consider this non-specification a limitation of the study. Senefonte et al.⁶ consider fractures from external causes those related to accidents at work, traffic, puncture wounds with firearms and/or a white weapon and explosives.

The Chapecó micro region, made up of 38 municipalities, has a hospital that encompasses large services, referring to the more expressive number of amputations of the state, followed by the Criciúma micro region. It has been observed that the regions.

Table 3. Incidence above 100 amputation surgeries by ICD and by municipality of the State of Santa Catarina, Brazil

City	Incidence by ICD			Total procedures	
	ICD (International Classification of Diseases)	N	%	N	%
Chapecó	S 68.1	207	49.4%	419	10%
	S 62.7	30	7.2%		
	S 67.8	24	5.7%		
	S 68.0	24	5.7%		
	S 68.2	24	5.7%		
Criciúma	Other	110	26.3%	287	6.9%
	S 98.3	56	19.5%		
	S 98.1	37	12.9%		
	S 68.1	35	12.2%		
	S 88.9	28	9.7%		
Brusque	S 78.9	22	7.7%	225	5.4%
	Other	109	38%		
	S 68.1	85	37.8%		
	S 68.0	34	15.1%		
	S 98.1	26	11.5%		
Lages	S 67.8	15	6.7%	219	5.3%
	S 88.9	9	4%		
	Other	56	24.9%		
	S 68.1	109	49.8%		
	S 68.0	29	13.2%		
São José	S 62.7	16	7.3%	141	3.4%
	S 68.2	16	7.3%		
	S 88.9	15	6.8%		
	Other	34	15.6%		
	S 98.1	55	39%		
Itajaí	S 68.1	21	14.9%	129	3.1%
	S 98.2	21	14.9%		
	S 68.2	15	10.6%		
	S 68.0	14	10%		
	Other	15	10.6%		
Joinville	S 88.9	43	33.3%	125	3%
	S 98.3	32	24.8%		
	S 78.9	9	7%		
	S 88.0	9	7%		
	Other	18	14%		
Joaçaba	S 68.1	13	10.4%	116	2.8%
	S 68.3	12	9.6%		
	S 98.3	12	9.6%		
	S 88.9	9	7.2%		
	S 68.2	7	5.6%		
Canoinhas	Other	72	57.6%	115	2.8%
	S 68.1	56	48.3%		
	S 68.2	21	18.1%		
	S 62.7	11	9.5%		
	S 68.0	9	7.7%		
Balneário	S 67.0	5	4.3%	111	2.7%
	Other	14	12.1%		
	S 68.1	51	44.4%		
	S 68.0	13	11.3%		
	S 62.7	10	9%		
Other	S 62.7	3	2.7%	2271	54.6%
	S 98.1	3	2.7%		
	Other	7	6.3%		
	Total				

This is justified because most of the expressive work activities in these regions use hazardous machines, both in the large agricultural industries in the micro region of Chapecó, as

well as in the textile, ceramics and coal mining industry in the micro region of Criciúma.

Accidents involving upper limbs in workers present very high prevalence, especially among people of working age.^{7,8} In this type of trauma, any injury, regardless of its severity, generates inability for the AVD's, but with greater impact on work activities.⁷

The data presented brought a predominance of traumatic amputation in the masculine populace of age under 50 years old. According to the literature, both the amputations of traumatic etiology and those originating from other etiologies, are more common in males,^{3,9-12} and in young individuals, due to the economically more active profile and susceptible to traffic and work accidents.^{3,11-14}

These data generate great socioeconomic impact to the country, because besides the fact that the individual becomes temporarily absent, requiring medical expertise report,¹² over long periods or either definitively¹⁵⁻¹⁷ receiving sick pay,¹⁶ amputations are highly complex surgeries which require large support structures and skilled professionals, generating high costs for SUS.^{18,19}

According to the Amputee Care Guidelines, an enabled multi professional team, with a human and ethical posture, is essential to promote the reception and to provide information appropriate to the patient and the family. When this multi professional team is active, it promotes a considerable reduction of 45 to 85% of amputation surgeries.²⁰ It is of extreme importance that the team be composed of professionals from various domains of activity such as vascular surgeon, orthopedist, nurses, physiotherapists, psychologists, among others, in order to allow for an adequate prevention or comprehensive rehabilitation of the amputee patient.⁴

Finally, a reduction in the total number of amputations is also highlighted, mainly in the last four years. However, preventive actions and educational partners such as: awareness campaigns, use of personal protective equipment at the occupational environment, among other actions, are essential for population prevention, and should be maintained in order to meet the need to reduce these numbers even more.¹³

These are considered simple and low cost strategies, and they really promote major improvements, ensuring better quality of life for the population.¹³

CONCLUSION

Despite the decrease observed in the number of amputations, mainly in the past four years, it is understood that epidemiological monitoring through Hospital Admission Authorizations (AIH's) may be expanded and come to life in the other Brazilian states, since these data are indicators that triggered the improvement of amputated patient care, with a view to organization of services, training of multidisciplinary teams, elaboration of preventive and social educative measures.

The high biopsychosocial impact that an amputation imposes on the individual justifies effective actions so that the reduction of numbers be increasingly expressive not only in our state, but in all national territory.

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