

Epidemiology of burns in Minas Gerais

Epidemiologia das queimaduras no estado de Minas Gerais

CARLOS EDUARDO GUIMARÃES
LEÃO¹
ELTON SILVA DE ANDRADE²
DREYFUS SILVA FABRINI²
RICARDO ARAÚJO DE
OLIVEIRA²
GISELE LELIS BURGARELLI
MACHADO²
LEANDRO COSTA GONTIJO²

Study conducted at the Plastic Surgery Service and Burns of Hospital João XXIII, which belongs to the Hospital Foundation of the State of Minas Gerais (FHEMIG), Belo Horizonte, MG, Brazil.

Submitted to SGP (Sistema de Gestão de Publicações/Manager Publications System) of RBCP (Revista Brasileira de Cirurgia Plástica/Brazilian Journal of Plastic Surgery).

Paper received: August 16, 2011
Paper accepted: October 31, 2011

ABSTRACT

Background: Burns are lesions to organic tissues caused by external agents, resulting in destruction of the epithelial covering. This study aims to clarify the epidemiological profile of burns at Hospital João XXIII, Belo Horizonte, MG, Brazil – the largest center for burn care in Latin America. **Methods:** A database of 687 patients admitted to Hospital João XXIII from February 2009 to July 2010 was created; it included patient demographics, burn etiology, surface and burned areas, intentionality, time of admission, and death profiles among other data. **Results:** Most of the admitted patients were male (62.5%), and the mean age was 29 years old; 66% were from Belo Horizonte, and 34% were from the countryside of other states. Alcohol was the most frequent etiologic agent (34.4%), which was responsible for the most extensive burns (average burned body surface: 28%) and responsible for most deaths (52.7%). With regard to intentionality, 79% were accidental burns, followed by suicide attempts (12%) and aggression (9%). The average period of admission was 23.5 days with a mortality rate of 16.3%, which is decreasing progressively. During the monitoring period, 984 debridement and 584 grafting procedures were performed. **Conclusions:** The obtained data are similar to those available in the literature. They also evidence the importance of burn prevention and highlight the need to re-examine how flammable products are marketed in order to decrease the morbidity and mortality rates caused by burns, since most burns are accidental and caused by liquid alcohol.

Keywords: Burns/epidemiology. Burn units/statistics & numerical data. Ethanol.

RESUMO

Introdução: Queimaduras são lesões aos tecidos orgânicos causadas por agentes externos, com destruição do revestimento epitelial. O objetivo deste estudo é divulgar o perfil epidemiológico das queimaduras do maior centro de queimados da América Latina, localizado no Hospital João XXIII, em Belo Horizonte, MG, Brazil. **Método:** Foi criado um banco de dados com 687 pacientes internados no Hospital João XXIII, no período de fevereiro de 2009 a julho de 2010, incluindo identificação dos pacientes, etiologia da queimadura, superfície e áreas queimadas, intencionalidade, tempo de internação e perfil dos óbitos, entre outros dados. **Resultados:** A maioria dos pacientes internados era do sexo masculino (62,5%), com média de idade de 29 anos, sendo 66% provenientes de Belo Horizonte e 34%, do interior ou de outros estados. O álcool foi o agente etiológico mais frequente (34,4%), o causador das queimaduras mais extensas (média de 28% de superfície corporal queimada) e o maior responsável pelos óbitos (52,7%). Quanto à intencionalidade, 79% foram queimaduras acidentais, seguidas pelas tentativas de autoexterminio (12%) e agressão (9%). A média do tempo de internação foi de 23,5 dias, com taxa de mortalidade de 16,3%, que vem caindo progressivamente. Foram realizados 984 desbridamentos e 584 enxertias durante o período de acompanhamento. **Conclusões:** Os dados obtidos são similares aos disponíveis na literatura e evidenciam a importância da prevenção e da fiscalização na forma de comercialização dos produtos inflamáveis para diminuir a morbidade e a mortalidade causadas pelas queimaduras, uma vez que a maioria é acidental e decorrente do álcool líquido.

Descritores: Queimaduras/epidemiologia. Unidades de queimados/estatística & dados numéricos. Etanol.

1. Plastic Surgeon, full member of the Brazilian Society of Plastic Surgery, head of the Plastic Surgery and Burns Service of Hospital João XXIII, which belongs to the Hospital Foundation of the State of Minas Gerais (FHEMIG), Belo Horizonte, MG, Brazil.
2. Resident physician of the Plastic Surgery and Burns Service of Hospital João XXIII, which belongs to FHEMIG, Belo Horizonte, MG, Brazil.

INTRODUCTION

A burn is defined as a skin lesion caused by an external agent resulting in partial or total destruction of a certain area of the body surface due to thermal, electrical, chemical, or radioactive trauma. The seriousness and prognosis of a burn are determined by assessing the following aspects: causative agent, depth, extent of the burned body surface, location, age, preexisting diseases, and associated lesions. The treatment of these lesions, including hospitalization requirement, is based on the factors mentioned above.

Second-degree burns affecting more than 15% and 10% of the body surface of adults and children, respectively; third-degree burns to more than 5%; electrical burns or burns that affect the airways, face, both hands, both feet, and perineum are the classic indications for hospital admission. However, patients may react differently to similar injuries; there may be lesions associated with the burns in addition to the social problems associated with the socioeconomic and cultural profiles of individual accident victims. Therefore, assistant physicians should not strictly follow rules for hospitalization, but analyze each patient individually and indicate the best treatment procedure for both outpatients and inpatients.

This study aims to reveal the epidemiological profile of burns in the entire state of Minas Gerais, Brazil, based on data from patients hospitalized in the Unidade de Tratamento de Queimados Prof. Ivo Pitanguy, located at Hospital João XXIII in Belo Horizonte, MG, Brazil, which belongs to the Hospital Foundation of the State of Minas Gerais – FHEMIG; it is the largest burn center in a public hospital in Latin America.

METHODS

This study analyzed the epidemiological profile of 687 patients admitted to the Unidade de Tratamento de Queimados Prof. Ivo Pitanguy from February 2009 to July 2010.

A database created by the Plastic Surgery and Burns Service with effective participation of the residents of the plastic surgery department was diligently updated at the time of patient discharge or right after death. The data included information such as name, age, gender, ethnicity, background, etiology, burned body surface, burn intentionality, affected areas, duration of hospital stay, number of procedures performed, use of antibiotics, and death profile.

This paper discloses the data obtained in the 18-month study period.

RESULTS

Out of the 687 patients, 62.5% (429) were male and 37.5% (258) were female.

Among these patients, 258 (37.6%) were between 31 and 60 years old, with a mean age of 29 years (Figure 1). Among the studied patients, 66% were from the city of Belo Horizonte, MG, Brazil.

Liquid alcohol was the most common etiologic agent of the burns, affecting 236 (34.4%) patients; this was followed by direct contact with superheated liquids (28.1%), especially water and oil (17.6%) (Figure 2). Alcohol was the major etiological agent of hospitalized patients older than 5 years, while scalding was the most prevalent cause in children up to 4 years of age.

The average burned body surface area was 20.8% and was slightly higher in females (22.3%) than males (20%). Burns acquired during suicide attempts were much more prevalent among women and usually affected large areas of

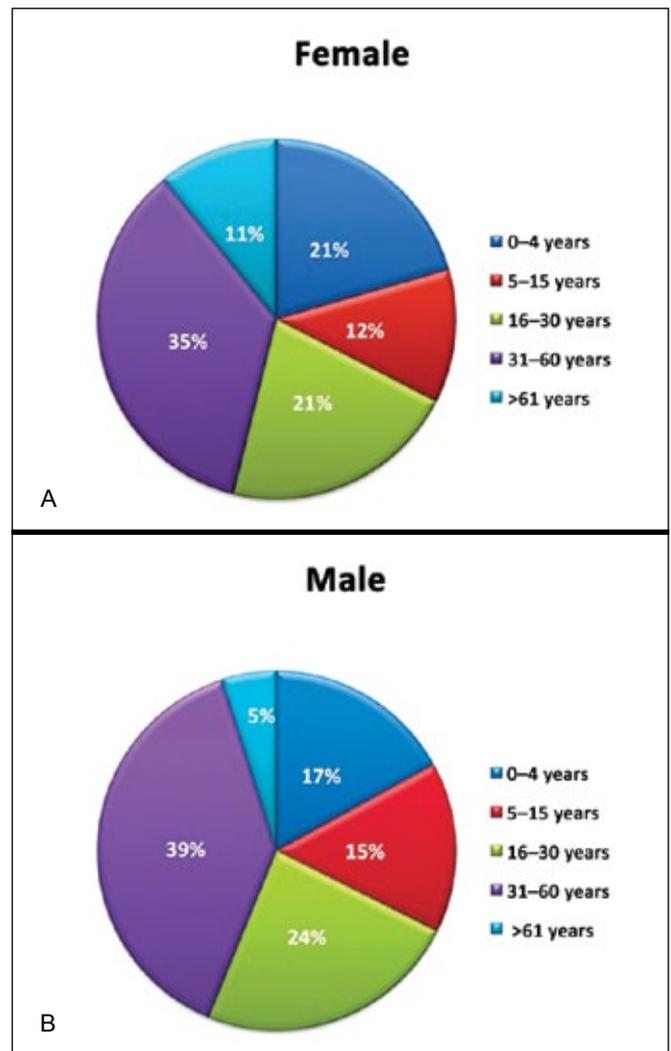


Figure 1 – Number of patients hospitalized at the Burns Care Unit (UTQ) by gender and age. A, females; B, males.

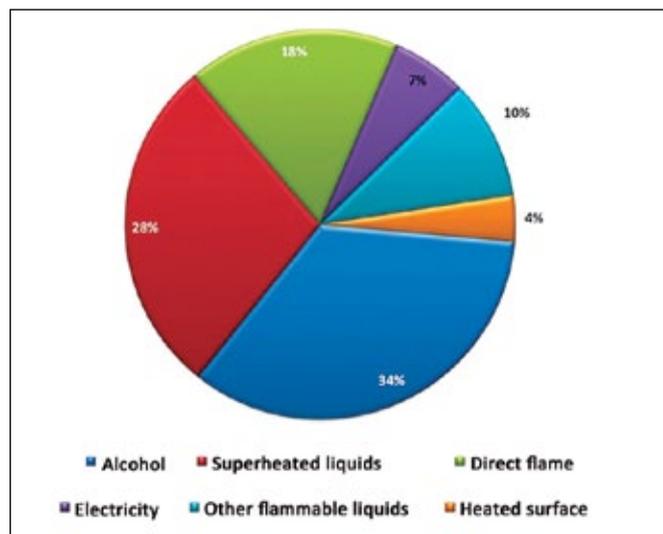


Figure 2 – Causes of burns in patients hospitalized at the Burns Care Unit (UTQ).

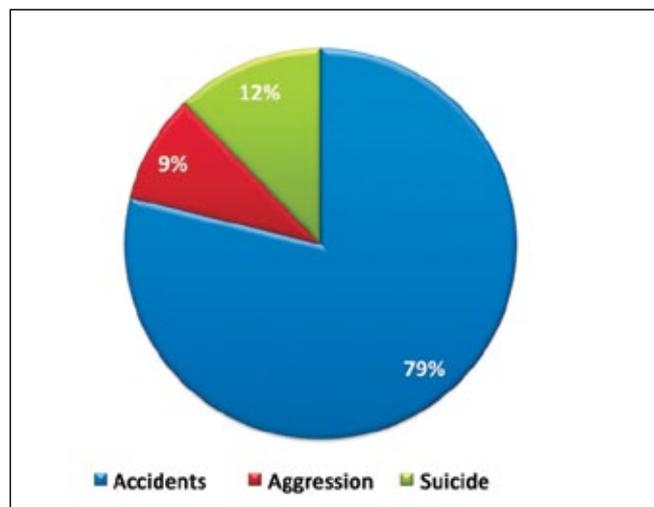


Figure 3 – Distribution of patients hospitalized at the Burns Care Unit (UTQ) by burn intentionality.

the body surface. The agent responsible for causing the most extensive burns was alcohol, affecting an average of 28% of the body surface.

Twelve percent of the patients were hospitalized due to suicide attempts, of whom only 33% were male; more than half (51%; average age of 39 years) died due to the seriousness of the burns, with the affected area being 40% of the body surface. Of all burns, 79% were accidental, while the remaining 9% were due to aggression (Figure 3).

The anterior thorax (60.2%), upper limbs (53.8%), and head (51%) were the most frequently burned regions in hospitalized patients (Figure 4).

The average duration of hospital stay was 23.5 days, and most of the patients (30%) remained hospitalized for a period ranging from 7 to 14 days (Figure 5). Among the hospitalized patients, only 33% received antibiotics during hospitalization.

During the monitoring period, 984 debridement and 584 grafting procedures were performed, with a mortality rate of 16.3% during hospitalization – a rate that decreased over the last few months of the study period. Again, alcohol was responsible for most of the deaths (52.7%) – most of them accidental (48%) – closely followed by suicide attempts (39%).

DISCUSSION

Lesions caused by burns are still responsible for a large proportion of all wounds and deaths due to external causes in Brazil. They are also responsible for a large number of employment leaves, and functional and aesthetic sequelae, especially in males. In this study, the percentage of male patients (62.5%) is concordant with the proportion reported

by Bessa et al.¹ in a similar study performed at Hospital Regional de Urgência e Emergência de Campina Grande, PB, Brazil, in 2006; this is because males are subjected to greater occupational risks than females.

In 1990, Kliemann² also observed that most affected patients were around 30 years old, which is similar to that found in the present study (29 years old); a large proportion of the workforce belongs to this age group. Moreover, burns affecting this section of the population result in substantial economic and social problems.

The results of this study demonstrate that liquid alcohol is the most common causative agent of burns, followed by contact with superheated liquids and direct heat; these findings were in agreement with the literature³. Scalding is the most common cause of burns in children up to 4 years of age, which is concordant with the epidemiological work of Cruz and Calfa⁴.

The average burned body surface of hospitalized patients (20.8%) is similar to that reported in the studies of Tejerina et al.⁵ (20.5%) and Le et al.⁶ (25%).

In this study, the most affected areas of the body were the anterior thorax and upper limbs, similar to the observations of Macedo and Rosa³.

Twelve percent of the hospitalized patients in this study acquired burns during suicide attempts, with an incidence of up to 20%, which is much greater than the value of 7.5% reported by Gimenes et al.⁷, in Sorocaba, SP, Brazil. These rates are alarming because the burns in such cases are often severe and affect large areas of the body, resulting in extremely high mortality rates.

The average hospital stay in the Unidade de Tratamento de Queimados Prof. Ivo Pitanguy was 23.5 days, and this value

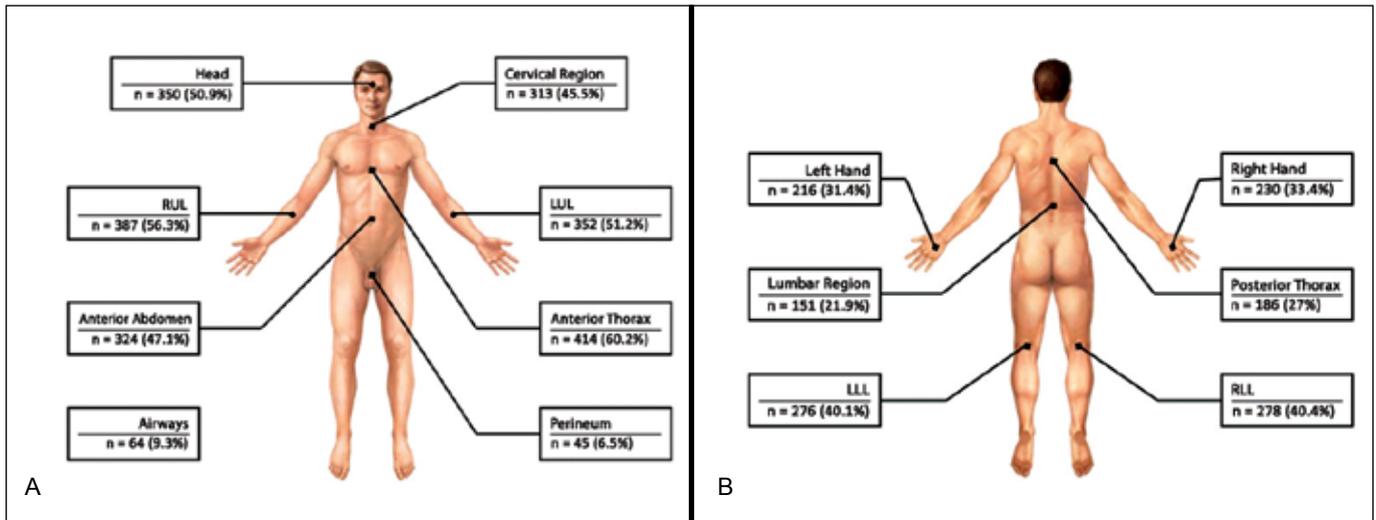


Figure 4 – Frequency of affected regions of the body in patients hospitalized at the Burns Care Unit (UTQ).

A, anterior view. *B*, posterior view. RLL = right lower limb; LLL = left lower limb; RUL = right upper limb; LUL = left upper limb.

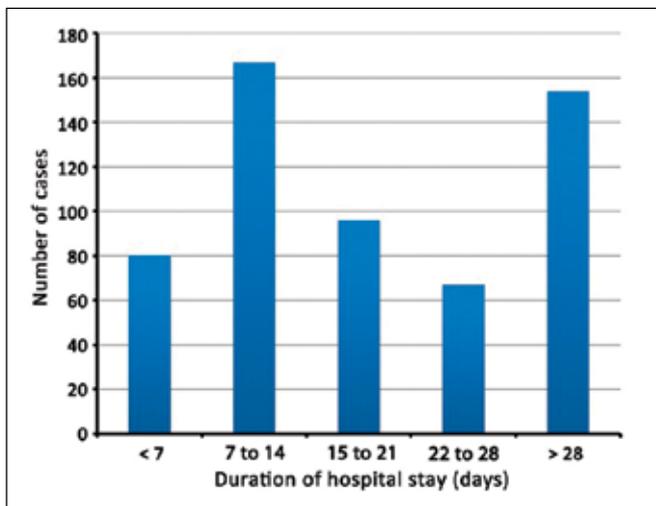


Figure 5 – Distribution of number of cases (*n*) by duration of hospital stay at the Burns Care Unit (UTQ).

is lower than the 30 days reported by Costa et al.⁸. Similarly, the mortality rate of 16.3% in the present study is much lower than the rate of 30% reported by Zarei et al.⁹, in Israel. These data evidence the importance of specialized burns units with an integrated multidisciplinary and organized staff to meet all the needs of patients with potentially lethal injuries⁷⁻¹².

CONCLUSIONS

The findings of this study evidence the importance of prevention to decrease morbidity and mortality due to burns

since majority of burns are accidental and many are caused by liquid alcohol. Domestic accidents comprised 51% of all burn cases, and 80% of them occurred in the kitchen. Children below 10 years of age represented 43% of all consultations for burns, including both outpatient patients and patients hospitalized in the Unidade de Tratamento de Queimados Prof. Ivo Pitanguy of Hospital João XXIII, Belo Horizonte, MG, Brazil. These 2 data sets show that, apart from being a medical problem, burns are a significant sociocultural problem.

Media campaigns that provide information about the dangers of accidental burns as well as government regulations regarding the marketing of alcohol would certainly help decrease the associated mortality rate.

Further, the inclusion of an accident prevention program in the Brazilian school curriculum in the early years of elementary school would definitely have a strong impact in reducing this sociocultural danger that is characteristic in Brazil and is found even among people from a higher social and economic strata. However, this can only be achieved by Brazilian authorities through greater political efforts.

REFERENCES

1. Bessa DF, Ribeiro ALS, Barros SEB, Mendonça MC, Bessa IF, Alves MA, et al. Perfil epidemiológico dos pacientes queimados no Hospital Regional de Urgência e Emergência de Campina Grande, PB, Brasil. *Rev Bras Ciênc Saúde*. 2006;10(1):73-80.
2. Kliemann JD. Estudo epidemiológico dos adultos internados por queimaduras no Hospital de Pronto Socorro (HPS-PA). *Rev HPS*. 1990; 36(1):32-6.
3. Macedo JLS, Rosa SC. Estudo epidemiológico dos pacientes internados na Unidade de Queimados: Hospital Regional da Asa Norte, Brasília, 1992-1997. *Brasília Méd*. 2000;37(3/4):87-92.
4. Cruz S, Calfã A. Estudio epidemiológico de quemaduras en niños meno-

- res de 6 años admitidos en la Corporación de Ayuda al Niño Quemado de la ciudad de Antofagasta. *Rev Cienc Salud*. 2001;5(1):17-26.
5. Tejerina C, Reig A, Codina J, Safont J, Mirabet V. Burns in patients over 60 years old: epidemiology and mortality. *Burns*. 1992;18(2):149-52.
 6. Le HQ, Zamboni W, Eriksson E, Baldwin J. Burns in patients under 2 and over 70 years of age. *Ann Plast Surg*. 1986;17(1):39-44.
 7. Gimenes GA, Alferes FCBA, Dorsa PP, Barros ACP, Gonella HA. Estudo epidemiológico de pacientes internados no Centro de Tratamento de Queimados do Conjunto Hospitalar de Sorocaba. *Rev Bras Queimaduras*. 2009;8(1):14-7.
 8. Costa DM, Abrantes MM, Lamounier JA, Lemos ATO. Estudo descritivo de queimaduras em crianças e adolescentes. *J Pediatr*. 1999;75(3):181-6.
 9. Zarei MR, Dianat S, Eslami V, Harirchi I, Boddouhi N, Zandieh A, et al. Factors associated with mortality in adult hospitalized burn patients in Tehran. *Ulus Travma Acil Cerrahi Derg*. 2011;17(1):61-5.
 10. Fracanolli TS, Magalhães FL, Guimarães LM, Serra MCVF. Estudo transversal de 1273 pacientes internados no centro de tratamento de queimados do Hospital do Andaraí de 1997 a 2006. *Rev Bras Queimaduras*. 2007;7(1):33-7.
 11. Crisóstomo MR, Serra MCVF, Gomes RD. Epidemiologia das queimaduras. In: Lima Júnior EM, Serra MC, eds. *Tratado de queimaduras*. São Paulo: Atheneu; 2004. p. 31-5.
 12. Mélega JM. *Cirurgia plástica: fundamentos e arte*. Rio de Janeiro: Guanabara Koogan; 2009.

Correspondence to:

Carlos Eduardo Guimarães Leão
Rua Ceará, 1.986 – 10º andar – Funcionários – Belo Horizonte, MG, Brazil – CEP 30150-311
E-mail: leao@leao.med.br