Factors associated with length of hospital stay in minor and moderate burns at Popayan, Colombia. Analysis of a cohort study

CrossMark

Marco Fidel Sierra Zúñiga, Oscar Eduardo Castro Delgado, Angela María Merchán-Galvis, Juan Carlos Caicedo Caicedo, Jose Andrés Calvache, Mario Delgado-Noguera [*]

Clinical Epidemiology Unit, Universidad del Cauca, Hospital Universitario San José (HUSJ), Popayán, Colombia

ARTICLE INFO

ABSTRACT

Objective: To determine the independent contribution of prognostic factors to length of hospital stay of minor and moderate burn victims at the Hospital Universitario San José (HUSJ), Popayán, Colombia, 2000–2010.

Methods: This was a retrospective cohort study of minor and moderate burn victims admitted between 2000 and 2010, at the burn unit (HUSJ). This is a further analysis of a same cohort previously published in *Burns*. The following variables were recorded and analyzed: age, gender, origin, depth and extent of burn, causal agent, length of hospital stay and mortality. The main outcome under study was length of stay. Survival analysis was done to explore the association of covariates and length of hospital stay and Cox regression model to adjust the effect of covariates in the outcome.

Results: During the study period 2000–2010, 842 of 921 (91.5%) patients treated at the Burn Unit of HUSJ that had complete data were included. There were 520 (61.8%) males and 322 (38.2%) females with a male to female ratio of 1.6:1. Their median age was 9 years (IQR 3–28). The median of percent total body surface area burned (TBSA) was 12% (IQR 7–21) and the most common degree of burn was 2nd degree with 58% (488 patients). There were 12 deaths (censored data) and 830 patients were discharged alive. After multivariate adjustment, significant associations with length of hospital stay remained for age group, burn degree and extension of the burn. The strongest relationship found was for burn degree (2nd degree superficial vs. 3rd degree hazard ratio = 2.66 CI 95% [2.13–3.33]).

Conclusions: In patients admitted with mild and moderate burns at HUSJ, the main predictors of length of stay were age, burn degree and extension of the burn.

© 2015 Elsevier Ltd and ISBI. All rights reserved.

1. Introduction

Burns are considered mostly as serious illness with devastating consequences and prolonged length of hospital stay [1].

Moreover, burns are among the traumatic lesions with higher costs for care due to their hospitalization time, treatment required and the need for rehabilitation therapy [1–3].

Burns are a global public health problem. In 2004, the overall incidence was 11 million affected people [1]. Each year,
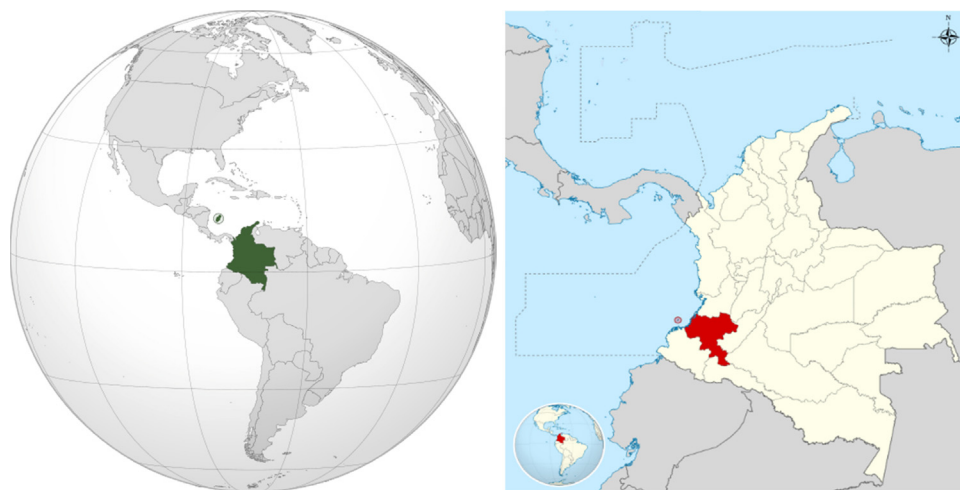

Fig. 1 – Cauca Department, Colombia in South America.

more than 265,000 people die from these injuries [4]. Over 90% of deaths whose burns are caused by fire occur in countries of middle and low income. Millions more, mostly among people of low socioeconomic status, suffer disability and disfigurement with psychological, social and economic consequences on the survivors and their families. Burns lead to costly, lengthy hospital stay and rehabilitation programs [2].

A study in Portugal in 2012 found that factors independently associated with hospital stay were age and the percentage of burned body surface [5]. Another study conducted in Pakistan in 2013 reported that the days of hospital stay were dependent on the age and sex of the patient, in addition to the cause of the burn, TBSA, body parts affected and inhalation injury [6]. In Colombia there are few studies that have determined the epidemiological profile of burns [7–10]. However, none of these studies have examined the independent contribution of prognostic factors to a result of clinical interest such as length of hospital stay.

The Burn Unit of Hospital Universitario San José (HUSJ) from the city of Popayán is the main and the only referral center for burn patients in the department of Cauca, southwestern Colombia (Fig. 1).

The aim of this study was to determine the independent contribution of demographic and clinical variables (such as age, gender and the percentage of total body surface area burned) with days of hospital stay in patients with minor and moderate burns admitted to this unit during 2000–2010.

2. Methods and materials

The design of our study was a retrospective cohort study designed to analyze follow up data of a cohort study. Details about data selection, collection and extraction were previously published in this journal [8]. All admissions at the HUSJ Burns Unit of Popayan, victims of mild and moderate burns admitted between 2000 and 2010 were analyzed.

Popayan, capital and main city of the department of Cauca, in 2010 had an estimated population of 270,000 inhabitants [11,12]. HUSJ is a university affiliated public hospital located in southwestern from Colombia.

The following variables were considered during data collection: demographics (age, gender and origin), the causative agent of the burn, area of the burned surface, degree of burn depth, length of hospital stay and mortality. In this study patients admitted to the intensive care unit of the center are not included because this unit was closed for the years 2001–2004 and those patients by the severity of his burns were sent to centers of greater complexity in another city.

The approval and acceptance for using the database of patients only for study purposes was carried out along with the research and ethics committee of HUSJ.

2.1. Statistical analysis

Statistical analysis was done using STATA 13.0 (StataCorp. 2013. Stata Statistical Software: Release 13. College Station, TX: StataCorp LP) and R (R Development Core Team (2008). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL: http://www.R-project.org). To describe categorical variables we used absolute frequencies and proportions. To summarize continuous variables mean and standard deviations or median and interquartile ranges were used according to the variable distribution.

Multivariate analysis was performed with time-to-event methods. The outcome under study was length of hospital stay. Survival duration was defined as the time between admission and hospital discharge. Kaplan–Meier survival curves and Mantel–Cox log-rank test were used to compare the degree and extension of the burn and length of hospital stay.

By using Cox Proportional Hazards regression modeling we tested the independent contribution of covariates with regard to the primary outcome. Results are presented as hazard ratios with 95 percent confidence intervals. Covariates included were age group (up to 1 year, 1–4 years, 5–14 years, 15–59 years or greater than 60 years), gender (male or female), origin (rural