Editorial

Long term mortality in burned children

María Teresa Rosanova[1], Daniel Stamboulian[2], Roberto Lede[3]

[1]Servicio de Control Epidemiológico e Infectología Hospital de Pediatría J P Garrahan, Buenos Aires, Argentina; [2]Presidente de la Fundación Centro de Estudios Infectológicos, Buenos Aires, Argentina; [3]Director de la Maestría en Investigación Clínica Farmacologíca, Universidad Abierta Interamericana (UAI), Buenos Aires, Argentina

Correspondence to: María Teresa Rosanova, MD, PhD. Servicio de Control Epidemiológico e Infectología Hospital de Pediatría J P Garrahan, Barragan 601, Zip Code 1408, Buenos Aires, Argentina. Email: margris2@yahoo.com.ar.

Abstract: Studies about risk factors for mortality in burn children are scarce and are even less in the follow up of this population across time. Usually, after complete event attendance, children are not follow-up as risk patients, burn injury affects all facets of life. Integration of professionals from different disciplines has enabled burn centers to develop collaborative methods of assessing the quality of care delivered to patients with burns. In this editorial we comment the paper of Duke *et al*. The authors highlight the importance of maintaining a long-term monitoring of children who suffered burns. The importance of this original study is to promote the reconsideration of clinical guides of long-term follow-up of burn patients.

Keywords: Mortality; burned; children; follow-up

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Introduction

Duke *et al*. (1) presented a population-based cohort study of children younger than 15 years hospitalized for burn injury in Western Australia between 1980 and 2012. The authors highlight the importance of maintaining a long-term monitoring of children who suffered burns, even mild, because death clearly exceeds that of the population free of that injury (1).

Burns are very frequent and affect approximately 1% of the general population every year. The immunocompromising effects of burns, hospital stay; diagnostic and therapeutic procedures place these patients at increased risk of morbidity and mortality. In the last few years patients who survived burn injury have increased (1,2). Studies about risk factors for mortality in burn children are scarce and even less in the follow up of this population across time (1). Additionally, the majority of papers on risk factors are conducted in a hospital setting (2-12). Overall mortality rates in burn patients are variable ranging between 3.5% and 12%, depending on the extension of the burn, age of the patient and presence of multiple organ failure. Patients with extensive burns have a poorer quality of life compared with that of the general population (3). Considerable physical and psychological problems still exist even long after discharge from hospital (1,2).

The research method adopted in the study by Duke is the one recommended to achieve this objective. The control group was recruited carefully matched by several relevant variables in order to reduce risk of bias, obtaining a rate of four controls for each case.

Usually, after complete event attendance, children are not follow-up as risk patients, and this study shows a 60% increase in the risk of death in this population compared with the general population. Authors point out that child with burns had a 1.6 times greater rate of long-term mortality than the matched population-based cohort of children with no injury. Therefore, "total mortality burden based on in-hospital deaths alone underestimates the true burden from both minor and severe burns". This paper emphasizes the usefulness of having individualized comprehensive and reliable population health records, however, these are only found in countries that have prioritized the importance of public health.

Our experience in the field (3) refers to risk factors for mortality only in hospitalized children. We included

110 children and mortality rate was 15 % higher than mortality rates reported in the literature and by Duke *et al*. (1). However, a limitation of our report is that the data were collected in a national tertiary referral center which may have caused patient selection bias, including a higher proportion of critically ill patients. Median ages of both burn cohorts (Duke *et al*. and Rosanova *et al*.) (24 *vs*. 31.5 months) as localization of burns were similar, but median total body surface area was higher 27% in our study *vs*. 20% in the study by Duke *et al*. Additionally, our patients had full-thickness in a higher percentage than those in Duke's study (47% *vs*. 8.4%).

Duke *et al*. (1) found that overall the children in the burn cohort were from disadvantages areas, a variable not studied by us; however our center is a public hospital serving mostly children without health insurance therefore this findings may be similar.

In our paper seventeen patients (15%) died and 14 of them of infection-related causes. By multivariate analysis: age ≤4 years, higher Garces's index (severity score), colistin use in multi-resistant infections, mechanical ventilation and graft requirement were independent variables related to mortality.

Gender was not associated with mortality in our series, unlike the findings by Duke *et al*. (1). Both papers consider age less than four years as a major risk factor for mortality in children (1-3).

Type B burn or "full thickness" uhas been viewed as a risk factor by several authors, a finding that was confirmed in our study but not in the one by Duke *et al*.

In our study we assessed some other variables that were not studied by Duke *et al*. such as invasive procedures, type of infections, type of microorganisms involved, and severity score on admission. All these factors may contribute to increase severity and higher risk of mortality in these patients even after discharge. Although the sample size in our study was not large enough to draw definitive conclusions for some of the studied variables, the findings may help to understand the issue given the paucity of systematic studies on this topic in children.

These variables could help doctors to identify those children that would need a longer follow-up after hospital discharge but further research is necessary to support the data. Knowledge of risk factors for mortality could be useful for the development of strategies to prevent this outcome that together with adequate referral to specialized centers will warrant a better management of these vulnerable patients. The predictive model for outcome may assist all the burn team in the identification of crucial determinants of clinical outcome.

Preventive care should be focused on primary prevention to avoid burns. It is necessary to deliver burn safety advice to population in order to raise safety awareness especially within the home environment (9-12).

Burn injury affects all facets of life. Integration of professionals from different disciplines has enabled burn centers to develop collaborative methods of assessing the quality of care delivered to patients with burns based on their ability to reintegrate into their normal physical, social, psychological, and functional activities (12). Further efforts to improve the quality of life of survivors of burn injury should ultimately have a very favorable impact upon the long-term outcomes in these patients who now survive such devastating injuries.

Duke *et al*. (1) present useful information that will aid clinicians in decision-making of comprehensive systematic regimens for long term rehabilitation and psychosocial treatment. We stress the importance of this original study that is likely to promote the reconsideration of clinical guides of long-term follow-up of burn patients.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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