International Journal of Research in Medical Sciences
Velez MDLAM et al. Int J Res Med Sci. 2022 Mar;10(3):586-589
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20220505

Original Research Article

Epidemiology of burn injuries in the elderly: 5-year review of a burn care unit in a referral hospital in Mexico City

María de los Angeles Mendoza Vélez[1]*, Leidy Arias Salazar[1], Mariana Montes Munguia[1], Erika Barlandas Quintana[1], Brenda Lorena Luna Zepeda[2]

[1]Plastic and Reconstructive Surgery Department of Hospital General, Dr. Ruben Leñero, Mexico, Mexico City
[2]Burn Care Unit Department of Hospital General Dr. Ruben Leñero, Mexico, Mexico City

Received: 20 January 2022
Revised: 13 February 2022
Accepted: 14 February 2022

***Correspondence:**
Dr. María de los Angeles Mendoza Vélez,
E-mail: mangelesmendozav@gmail.com

ABSTRACT

Background: Burn injuries in elderly are one of the leading causes of morbidity and mortality in Mexican people over 65-year. The aim of this study was to describe the epidemiology of burn epidemiology in people over 65-years old over a 5-year period at a level II general Hospital in Mexico City. The objective of the study was to determine the incidence of burn injuries in people over 65-years in a regional Hospital in Mexico City over a 5-year period.
Methods: Retrospective study; records of burn department of all adult patients who sustained burn injury between January 2017 to July 2021 were collected. Details about age, gender, and location of the injuries were recorded and analyzed.
Results: From a total of 61 cases, 40 males (65.57%) and 21 females (34.43%) were affected. The two most burn places in the human body were the head and neck with 30 cases (49.18%), followed by the upper extremity in 29 cases (47.54%), 41 burns (67.21%) were due to flames, 13 (21.31%) due to scalds and 7 (11.48%) were electrical.
Conclusions: Burn injuries in elderly people are a frequent cause of mortality injury in the burn care unit, representing a health issue in our country. Proper patient evaluation and treatment are essential to prevent further complications and subsequent morbidity and mortality in this population.

Keywords: Burn injury, Epidemiology, Elderly, Morbidity, Mortality

INTRODUCTION

Burns is damage to the skin and loss of the primary barrier to infections.[1] Burns are among the most severe kind of harm that may ever affect a human being. Burns continue a medical, psychological and economic problem.[2] Elderly burn care represents a vast challenge and it is one of the more susceptible population to burn injuries.[3] Severe burn injuries in surviving people is considered a traumatic experience related to physical and psychological consequences.[4] Burns injuries account for the greatest length of stay of all hospital admissions for injuries.[5] Burn prevention, to be effective in a particular area, should be based on sound knowledge of etiological patterns of burns injuries and must consider the geographical variations and socioeconomic differences in burn epidemiology.[6,7] The World Health Organization estimates that the lifetime incidence of severe burns is 1% and that more than 300,000 people die annually from elated burns worldwide.[8,9] The prevalence of burns is significantly higher in developing countries than in developed ones. Due to damage to the skin and other organs, burns can lead to open wounds, disability, death, major economic consequences, severe emotional and psychological complications, and economic burden.[9]

More than 90% of all burns are preventable, burns remain common and are a major public health problem.[10] The American Burn Association (ABA) reports more than 450,000 patients are treated in emergency rooms for burns annually.[11] Mortality for patients with more than a 40% total body surface area (TBSA) burn is 95%[12] Approximately 3400 burn patients will not survive their injuries.[13]

Aged patients seem to be vulnerable to burns and remain a high-risk group concerning treatment and outcome in all burn units.[14,15] Elderly patients with severe burns are globally recognized as a challenge for burn care specialists.[16]

Mainly due to a lack of nationwide registration systems in many countries, exact epidemiologic data on burn injuries in Mexico are still not reported. Not many articles have been published about burns in Mexico. However, the epidemiology of burn injuries in Mexico is poorly studied and not provided in the literature, as well as burn data relating to epidemiology on adults, children and occupational burns in Mexican population never have been reported. Therefore, the primary objective of this study is to determine the incidence of burn injuries in a five-year period in a regional Hospital at Mexico City. As secondary objectives we will study demographic information of included patients. Complications and management of burn injuries will be incorporated too.

METHODS

This is a descriptive retrospective study, based in data collection of the patients treated in the burn unit between January 2017 and July 2021 in General Hospital ¨Dr. Ruben Leñero¨ (Mexico City). The data collection was retrieved from computerized patients records and administration system. Ethical approval to use patient´s records for the study was obtained from the administration of a general hospital "Dr. Ruben Leñero".

The case files were then reviewed to identify burn injuries, demographic of the study population, extent of burn – total body surface area, causes of burns, length of stay and mortality, management and complications related to these injuries. Inclusion criteria for the study were age of 65 years or older with burn injuries in any place of the body attended within the burn care unit between January 2017 - July 2021. 61 patients were collected. Patients with an age under 65-year were excluded. Participants with any missing data were also excluded. Statistical package for social sciences (SPSS) version 18.0 for MAC (SPSS Inc. Chicago, IL, USA) was used for analyzing data.

RESULTS

A total of 61 patients were included in our study, 40 males (65.57%) and 21 females (34.43%) were affected with burn injuries. The mean (SD) age was 74.9 (7.35) years.

Table 1: Total body surface area.

Percentage	Number	Total
<10%	14	22.95%
10-19%	22	36.07%
20-49%	18	29.5%
50-79%	3	4.92%
>80%	4	6.56%
Total	61	100%

Table 2: Frequency and percentage of different causes of burns in elderly.

Causes of burn	Frequency	Percentage
Flame		
Propane gas	29	47.54%
Gasoline	5	8.20%
Tiner	4	6.55%
Others	3	4.92%
Scald	13	21.31%
Electrical	7	11.48%
Total	61	100%

The number of home accidents were found to be 39 patients (63.93%) followed by occupational accidents with 16 patients (26.23%). The percent total body surface area (TBSA) burnt in admitted patients ranges from 1-100%, we found 14 patients (22.95%) with less than 10% TBSA, 22 patients (36.07%) with 10-19% TBSA, 18 (29.50%) with 20-49%, 3 (4.92%) with 50-79% TBSA and 4 (6.56%) with over 80% TBSA. (Table 1)

The two most burn places in the human body were the head and neck with 30 cases (49.18%), followed by the upper extremity in 29 cases (47.54%) and all patients had combined burns.

We found that a total of 41 burns (67.21%) were due to flames, 13 (21.31%) due to scalds and 7 (11.48%) were electrical. Flame injuries are generally more common than scalds among the admitted patients in this study and 23 patients had concomitant diseases. (Table 2)

Most of patients were referred and admitted at 4 to 15 days after their burns, the majority related to lack of family support; patients didn't receive fluids resuscitation because of the time between the burn and the moment that they arrived to the hospital.

Primary treatment used was wound cleaning, debridement and skin coverage with skin grafts.

After treatment based in intravenous fluids, antibiotics in patients with indications and skin coverage with skin graft, 44 patients were discharged with full recovery and 17 patients died. Mortality was due to multiple organ

failure in 15 patients (88.24%), 1 (5.88%) pneumonia and 1 (5.88%) related to COVID-19.

DISCUSSION

During the period studied, 1,168 patients visited our emergency burn care unit, a total of 61 (5.22%) cases were reported over 65-year.

We also observed that the incidence of burn injuries in the elderly was higher among men and more frequent due to flame burns.

Severe burns are a huge social and financial burden in developing countries, with an estimated 90% of the world's incidents occurring in low- and middle-income countries.[13] The population of elderly patients is expected to rise due to the global demographic changes.[14]

Most studies found, that burns in the elderly most commonly occur at home, especially in the kitchen.[15-18] This is in contrast to other age groups, adults, where burns usually are a result of an incident at work or related to activities outside of the household.

Lionelli et al assessed mortality of elderly burn patients (>75 years) from 1972 to 2000. Their overall data showed a 77% mortality rate in the 1970s, whereas there was a 41% mortality rate during the 1980s and 1990s representing a close to 50% reduction between the two time periods.[19]

Zöch et al demonstrated a 50% decrease in mortality in the elderly, comparing burns occurring in the early 1980s versus those that occurred in the latter half of the decade.[20] They attributed these improvements to advanced wound care, an increased nurse to patient ratio, and enhanced nutritional supplementation.

Pereira et al could not show any improvement in the mortality rate of women 65–92 years. Mortality consistently improved in most age groups for men and for women younger than 65 years.[21]

Elderly burn patients are frequently living alone without adequate social or family support. They have little to no knowledge of first aid measures and more than one-third of patients had no first aid treatment. Nearly 43% of the patients had their wounds taken care of inappropriately, also contributing to a prolonged hospital stay and increased mortality rate.[22,23]

Most studies found that burns in the elderly most commonly occur at home, as well as results in our study most of burns occurred at home.[24]

Guerrero et al reported in 2010 a total of 334 patients admitted in the burn care unit in General Hospital Dr. Ruben Leñero, with a predominance of male gender and most of patients were young adults.[25]

In Mexico, Romero et al reported in 2019 a total of 1774 patients studied in the period between january 2014 to December 2018 treated in the burn care unit in General Hospital Dr. Ruben Leñero.[26] Medical literature and epidemiological data recorded in the electronic statistical system of the Mexican Health Ministry show that "accidents" and burns are preventable diseases that generate high mortality and disability as well as high health costs of the integral medical care, so it is necessary to be created the intersectorial mexican oficial norm of prevention and treatment of sinisters that include burns.[27]

Length of hospital stay was significantly associated with the extent of burns or burn thickness. It is worth saying that length of hospital stay was shorter when TBSA increased beyond 50% due to high mortality rate in this group which is consistent with other studies.[29-30]

Nevertheless, we acknowledge that collection of data was done retrospectively and restricted to one center, both representing limitations for our study. Further investigation will be required to establish this last proportion of patients as well as risk factors associated whit this type of injuries in the elderly.

CONCLUSION

Burn injuries in elderly people are a common occurrence in Mexico, it has a physical and emotional role participation in survivors, as well they need mental and physical support in the aftermath of burns. We conclude the high morbidity and mortality in this group studied because of the lack of family support. We believe this is an important article for further investigations to prevent burns in elderly people. However, we believe further investigation will be required to establish risk factors which may increase burn injuries incidence rates.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the hospital administration and burn care department in General Hospital "Dr. Ruben Leñero".

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Manning J. Sepsis in the Burn Patient. Crit Care Nurs Clin N Am. 2018.
2. Hemeda M, Maher A. Mabrouk. Epidemiology of burns admitted to Ain Shams University Burns Unit, Cairo, Egypt. Burns. 2003;29:353-8 .
3. Jeschke M, Peck M. Burn Care of the Elderly. J Burn Care Res. 2017;38(3):e625-8.
4. Spronk I, Legemat C, Oen I, van Loey N, Polinder S, van Baar M. Health related quality of life in

adults after burn injuries: A systematic review. PLoS ONE. 2012;3(5):e0197507.
5. Toon MH, Maybauer DM, Arceneaux LL, Fraser JF, Meyer W, Runge A, et al. Children with burns injuries – assessment of trauma, neglect, violence and abuse. J Inj Violence Res. 2011;3(2):98-110.
6. Liao CC, Rossignol AM. Landmarks in burn prevention. Burns. 2000;26(5):422-34.
7. Linares AZ, Linares HA. Burn prevention: the need for a comprehensive approach. Burns. 1990;16(4):281-5.
8. WHO. A WHO plan for burn prevention and care. World Health Organization. 2008.
9. Li H, Yao Z, Tan J, Zhou J, Li Y, Wu J et al. Epidemiology and outcome analysis of 6325 burn patients: year retrospective study in a major burn center in Southwest China. Scientific Reports. 2019;7:46066
10. Ahn CS, Maitz PKM. e true cost of burn. Burns. 2012;38:967-74.
11. American Burn Association (ABA). Burn statistics. 2018. Available at: http:// burninjuryguide.com/burn-statistics/. Accessed on 20 November 2021.
12. Tripathee S, Basnet S. Epidemiology and outcome of hospitalized burn patients in tertiary care center in Nepal: two-year retrospective study. Burns. 2017;1(1):16-9.
13. Dissanaike S, Rahimi M. Epidemiology of burn injuries: Highlighting cultural and socio-demographic aspects. International Review of Psychiatry. 2009;21(6):505-11.
14. Keck M, Lumenta DB, Andel H, Kamolz LP, Frey M. Burn treatment in the elderly. Burns. 2009;35:1071-9.
15. Bessey PQ, Arons RR, Dimaggio CJ, Yurt RW. The vulnerabilities of age: burns in children and older adults. Surgery. 2006;140(4):705-15.
16. Khadim MF, Rashid A, Fogarty B, Khan K. Mortality estimates in the elderly burn patients: The Northern Ireland experience. Burns. 2009;35:7-13.
17. Mabrouk A, Maher A, Nasser S. An epidemiologic study of elderly burn patients in Ain Shams University Burn Unit, Cairo, Egypt. Burns. 2003;29:687-90.
18. Baux S, Mimoun M, Saade H. Burns in the elderly. Burns. 1989;15:239.
19. Feck G, Baptiste MS. The epidemiology of burn injury in New York. Public Health Rep. 1979;94(4):312-8.
20. Lionelli GT, Pickus EJ, Beckum OK, DeCoursey RL, Korentager RA. A three-decade analysis of factors affecting burn mortality in the elderly. Burns. 2005;31:958-63.
21. Zöch G, Meissl G, Bayer S, Kyral E. Reduction of the mortality rate in the aged burn patients. Burns 1992;18(2):153-6.
22. Pereira CT, Barrow RE, Sterns AM, Hawkins HK, Kimbrough ChW, Jeschke MG, et al. Age-dependent differences in survival after severe burns: a unicentric review of 1,674 patients and 179 autopsies over 15 years. J Am Coll Surg. 2006;202:536-48.
23. Ho WS, Ying SY, Chan HH. A study of burn injuries in the elderly in a regional burn centre. Burns. 2001;27:382-5.
24. Baux S, Mimoun M, Saade H. Burns in the elderly. Burns. 1989;15:239.
25. Guerrero L, Bravo B, Escobedo J, Retana L, Noriega A, Figueroa B, Basilio A. Revisión retrospectiva de trauma por quemadura en adultos en un centro de referencia de pacientes quemados. Revista Trauma en América Latina. 2011;1(2):96-104.
26. Romero J, Baruch M, Ugalde I, Suero J, Pacheco R, Vázquez H. Incidencia y manejo clínico de quemaduras por corriente eléctrica en el Hospital General "Dr. Rubén Leñero". Revista Trauma en América Latina. 2019;9(1):6-10.
27. Moctezuma L. y cols. Epidemiología de las quemaduras en México. Rev Esp Méd Quir. 2015;20(1):78-82.
28. Elsous A, Ouda M, Mohsen S. Epidemiology and outcomes of hospitalized burn patients in Gaza strip: a descriptive study. Ethiop J Health Sci. 2016;26:9-16.
29. Muguregowda TH, Pramod K, Padmanabha U, Pragna R. Epidemiological study of burn patients hospitalised at a burns centre, Manipal. Int Wound J. 2018;16(1):1-5.
30. Yaacobi D, Hayun Y, Har-Shai L, Litwin A, Dean D, Epidemiology of Burn Wounds Arriving to a Level 1 Trauma Center in Israel. J Burn Care Res. 2020;41(2):317-21.

Cite this article as: Vélez MDLAMSalazar LA, Munguia MM, Quintana EB, Zepeda BLL. Epidemiology of burn injuries in the elderly: 5-year review of a burn care unit in a referral hospital in Mexico City. Int J Res Med Sci 2022;10:586-9.