

# Study of Seasonal Variations in Presentation of Medicolegal Cases Of Burns in A Tertiary Care Hospital

ZULFIQAR ALI BUZDAR<sup>1</sup>, KANWAL ZAHRA<sup>2</sup>, MARYAM SHAHID<sup>3</sup>, MUHAMMAD ANWAR SIBTAIN FAZLI<sup>4</sup>, JAVAID MUNIR<sup>5</sup>, ZIA UL HAQ<sup>6</sup>, FAKHAR UZ ZAMAN<sup>7</sup>

<sup>1</sup>Assistant Professor Forensic Medicine and Toxicology, Sahara Medical College, Narowal.

<sup>2,3</sup>Assistant Professor, King Edward Medical University Lahore.

<sup>4</sup>Assistant Professor, Avicenna Medical College

<sup>5</sup>Assistant Professor, Red Crescent Medical & Dental College Lahore.

<sup>6</sup>Assistant Professor, Continental Medical College Lahore.

<sup>7</sup>Assistant Professor, Allama Iqbal Medical College Lahore.

Correspondence to Dr. Zulfiqar Ali Buzdar, Email: [forensicatitsbest@gmail.com](mailto:forensicatitsbest@gmail.com), Cell +92 333 6011 247

## ABSTRACT

**Background:** The burns resulting from heating mechanisms or hot sources are inevitable as such a scheme is an integral part of human's life. It though benefits on one hand but unfortunately it harms as well especially if due care is not rendered in this regard.

**Aim:** To assess the seasonal effects on presentation of victims of burns.

**Methods:** An analytical cross-sectional study was conducted on the medicolegal cases of burns filtered at medicolegal clinic of Mayo Hospital Lahore, Accident and Emergency Department from December 2017 to August 2018. A total of 250 cases were studied presenting in the above setting.

**Result:** The study revealed the seasonality as a quiet common and impressive factor in reporting of victims of burns in the medicolegal clinic of Mayo Hospital/King Edward Medical University Lahore. The winter months of December, January and February were the most common reporting months of study showing maximum peaks.

**Keywords:** Burns, Season, Variation, Factors

## INTRODUCTION

Burn is also one form of trauma to human tissue. It destroys the tissue by several means including corrosion or erosion depending upon variety of its source.<sup>1</sup> WHO defines burns as contact with any hot object or heating source or exposure to a flame source or smoke source also includes electrocution and lightening.<sup>2</sup> Though the burns are reported in all parts of the world and in all seasons but are more prevalent in underdeveloped, lower income and lower socio-economic status countries and in spring or winter season<sup>1,2,3</sup>.

Winter and spring season has the greatest impact on increasing the burden of burns victim especially reported in Egypt, and epidemiological study shows.<sup>4</sup> A study stretched almost over a span of a decade extending from 2005 to 2014 shows that there was not much difference of the season on presentation of the victims of burns though it was conducted invariably in the electric sources of burns i.e. electrocution.<sup>5</sup> A quiet high proportion of burns was reported in India during winter season involving more females than males as compared to that of any other season<sup>6</sup>. Soltani (1998) studied the epidemiology of burns showing maximum mortality in the winter season in Iran as compared to the warmer months of the country<sup>7</sup>. Quiet a high prevalence was observed in burns victim presentation in the Northern regions of Pakistan in winter or spring seasons resulting into disabilities, complications or even in high mortality.<sup>8</sup> Burns injuries though preventable but still inevitable becomes marked high in colder environment or winter season because of the increased demand for a warmer or an ambient living temperature<sup>9</sup>.

The season determines the contact time of the person with heating source and thereby increasing in the duration of contact time and hence increase in incidence or presentation of burns victim during colder seasons<sup>5-9</sup>. The other factors that increase the presentation of burns in seasonal variation are the clothing a person prefers to wear, overcrowding and congested environment are the other factors that constitute to higher number of cases presenting as burns victim in winter seasons<sup>6,9</sup>.

## MATERIALS AND METHODS

A population of 250 cases was studied during 08 months of time span from December 2017 to July 2018 deliberately choosing the most hot and cold season of the country in order to be able to study the seasonal variation among the victims of burns after approval from IRB. All the cases presented during the above mentioned period in the medicolegal clinic of the Accident and Emergency Department of Mayo Hospital Lahore.

All the cases of burns presenting in the study setting except those who did not consent for participation in study were included in the study. The study was descriptive cross-sectional study on the seasonal variations of burns and collected with non-probability consecutive sampling technique including all the victims of burns irrespective of their age, gender, ethnic origin, class, occupation, manner of burns and source of burns.

The data was collected using a standard questionnaire. The questionnaire was pretested and appropriate modifications and amendments were made. Information were collected on basic demographics, socio-economic class, source of exposure, income, educational level and profession etc.

Received on 14-04-2021

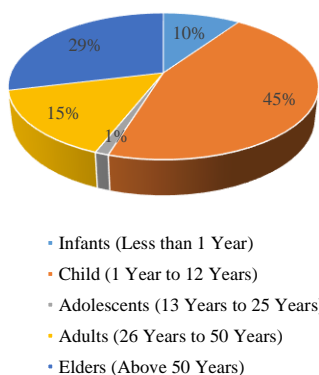
Accepted on 22-08-2021

Data was collected during collection and had been analyzed using SPSS version 20.0. Descriptive analysis were carried out to seasonal variation and statistical significance in relation to seasonal variations. Data presentation was made through frequency graphs tables.

**RESULTS**

**Frequency distribution of age:** The study population of 250 cases included all the age groups and were placed in different age groups namely infants being less than 1 years of age, child being 01 year to 12 years of age, adolescents with 13 years to 25 years of age, adults with 26 years to 50 years of age and finally elders with age above 50 years.

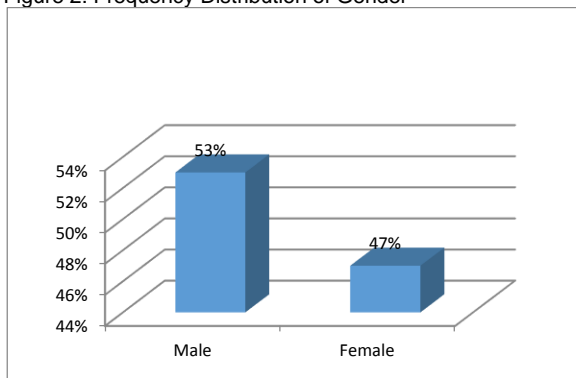
Figure 1: Frequency Distribution of Age



As revealed in figure 01 above, among the study participants 24 (9.6%) were infants (less than 1 year), 113 (45.2%) were child (1 year to 12 years), 3 (1.2%) were adolescents (13 years to 25 years), 38 (15.2%) were adults (26 years to 50 years) and 72 (28.8%) were elders (above 50 years). The study revealed that the highest frequency 113 (45.2%) was exhibited by child age group ranging from 01 year to 12 years whereas the least frequency 3 (1.2%) was observed in adolescents age group (13-25 years).

**Frequency distribution of gender:** Included in study were the subjects of all age groups and without any gender predilections. The subjects were included according to non – probability convenient purposive sampling technique.

Figure 2: Frequency Distribution of Gender



The gender distribution was calculated as shown in table 02 above. Out of total 250 subjects there were 117 (46.8%) females and 133 (53.2%) males. The frequency revealed male preponderance in burns incidents as compared to females though difference was quite minimal.

**The frequency distribution of seasonal variations:** The burns presentation is widely affected by the seasons especially the winter where it grossly increases and conversely great reduction in summer occurs. Keeping this diurnal variation in mind the peak winter and summer months of a calendar year from December to August were included so that exact situation could be assessed.

The study was stretched over a period of eight months from December 2017 to July 2018 without any interruption and presentation of the subjects in each month was as shown below in graph of figure 02. On the basis of the months of distribution the seasonal variation could also be analyzed. The time span of the sample collection amply has peak months of winter and summer seasons, the two main determinants in seasonal variations of the burns.

The month of December, January, February and March are the definitive months of winter season. Similarly April, May, June and July are perfectly summer months of a calendar year, hence denoting summer seasons. So the seasonal variation has thus been evaluated through this month-wise distribution of cases.

Figure 2: Month-wise distribution of burn subjects.

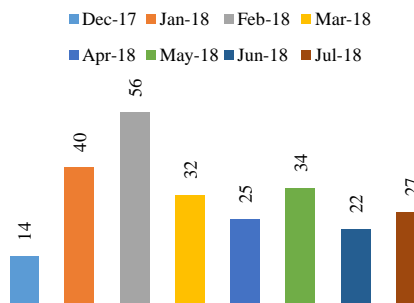


Fig.2 shows above revealed the month-wise presentation of the burnt subjects. There were 14(5.6%) subjects in December 2017, 40(16%) in January 2017, 56(22.4%) in February 2018, 32(12.8%) in March 2018, 25(10%) in April 2018, 34(13.6%) in May 2018, 22(8.8%) in June 2018 and 27(10.8%) in July 2018.

The study revealed highest frequency in winter months of a calendar year like December, January, February and March. Only last third of the month of December days were included for sample collection of the subjects under study. In summer months the frequency gradually declined.

**DISCUSSION**

The statistical significant increase was reported only in colder months of the calendar year in a study spanned over four years. It was found to be in agreement with study findings of our research article. The same was found significant in our research facts that maximum burns cases are reported in winter months of an year.<sup>10</sup> More than

double the numbers of the burns cases were reported in winter months of December to February as compared to summer months of June and July (the study did not include the month of August.) as for as non-fatal burn injuries were concerned. Thereby showing maximum frequency in winter months of an year. The study findings were again in line those with current study statistics.<sup>11</sup>

Several countries other countries like Nepal, India and Bhuttan showed a negative slope, beside Pakistan showed a poor correlation of season with incidence of fire events. The results were not in agreement with our study<sup>12</sup>. Conversely maximum seasonal hospitalization was observed in summer months as compared to that of winter months. The study findings were opposite to those reported in current study of ours<sup>13</sup>.

But still a study finds maximum number of burns incidence being reported in relatively winter months of a calendar year. The study statistics verified the observations of current study conducted by us in the same country<sup>14</sup>.

## CONCLUSION

The current study concludes statistically significant number of burns cases are reported in winter months of an year especially in the region of the world like Pakistan where definitely other factors including literacy rate, socio-economic status and seasonal variation has a role to play<sup>8,9,14</sup>.

The peak months were reported to those of the winter months i.e. December, January and February with maximum peaks of burns victims reporting in different health facilities. Beside Pakistan several other parts of the world has same pattern of distribution of the burns cases in a calendar year<sup>10,11,14</sup>.

The current study upon significant statistical data concludes that seasonal variation does play a role at least in countries like Pakistan and those in vicinity. The most common presentation of burns victim irrespective of the source of fires and their demographic variables is the winter season<sup>1,2,8,9,14</sup>.

**Conflict of interest:** Nil

## REFERENCES

1. Ambrosio, L. The role of biomaterials in burn treatment. *Burns & trauma*. 2014;2(4): 150.
2. Organization, W. H.O. *The world health report 2006: working together for health*: World Health Organization, 2006.
3. Goswami P, Singodia P, Sinha A, Tudu T, Five-year epidemiological study of burn patients admitted in burns care unit, Tata Main Hospital, Jamshedpur, Jharkhand, India. *Indian Journal of Burns*, 2016;24(1):41.
4. Hemeda M, Maher A, Mabrouk A, Epidemiology of burns admitted to Ain Shams University burns unit, Cairo, Egypt. *Burns*,2003;29(4):353-8.
5. Ortiz-Prado E, Armijos L, Iturralde A, A population-based study of the epidemiology of acute adult burns in Ecuador from 2005 to 2014. *Burns*,2015;41(3):582-9.
6. Sharma NP et al, Descriptive epidemiology of unintentional burn injuries admitted to a tertiary-level government hospital in Nepal: gender-specific patterns. *Asia Pacific Journal of Public Health*,2015;27(5):551-560.
7. Soltani K, Zand R, Mirghasemi A, Epidemiology and mortality of burns in Tehran, Iran. *Burns*,1998;24(4):325-8.
8. Ahmed M, Shah M, Luby S, Drago-Johnson P, Wali, S, Survey of surgical emergencies in a rural population in the Northern Areas of Pakistan. *Tropical Medicine & International Health*,1999;4(12):846-857.
9. Siddiqui N, Burn-injury is preventable:An analysis of 716 cases in a burns unit. *Journal of the College of Physicians & Surgeons Pakistan*,1998;8(4):148-152.
10. Tyson AF, Gallaher J, Mjuweni S, Cairns BA, Charles AG. The effect of seasonality on burn incidence, severity and outcome in Central Malawi. *Burns*, 2017; 43(5):1078-1082
11. He S. et al, Epidemiology of Burns in Rural Bangladesh: An Update. *International Journal of Environmental Research and Public Health*, 2017;14(4):381
12. Krishna VP, Kristofer L, LouisGiglio, Wilfrid Schroeder, Sumalika Biswas, Chris Justice, nature.com/scientific reports,(2019);9(1):7422
13. Artem S, Emmanuel R, Luis H, Scott H, Asif M, Seasonal Variation in Hospitalizations for Burn Injuries, *Journal of Burn Care & Research*, 2020;1(41):120-9
14. Hassan Q, Ali I, Mirza F, Burns:Epidemiology and Distribution Pattern in Karachi - A One-Year Survey, *Pakistan Journal of Medicine and Dentistry*,2018;7(04):97-102