

## A Clinicoepidemiological Study of Burns At A Tertiary Care Hospital At Mumbai, India

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**Abstract:** Burn Injuries Represent An Extremely Stressful Experience And Is A Complex Devastating Condition Causing An Acute And Long-Term Functional, Psychosocial And Economical Impairment To The Patient And Care Givers Affecting Over A Million People In India. We Describe The Demographic, Socio-Cultural Aspects Of Burns Patients, Various Etiological Factors And Try To Correlate Them With Outcome. The Aim Was To Aid Recognition Of Preventive Strategies In Future. Retrospective Audit Was Done Of Admitted Burns Patients From 1<sup>st</sup> January 2013 To 31<sup>st</sup> December 2015. Study Group Had 659 Patients With 359 Being Females. Mean Age Of The Study Group Was 27.7 Years With Most Affected Age Group Being 20-40 Years With 59.2% (390) Patients. Severe Burn Cases Were Admitted With Us With Mean % Tbsa Being 40.7%. Mean Duration Of Stay Was 30.5 Days. Single Most Common Cause Of Burns In Patients Admitted With Us Was Stove Blast. Mean Hemoglobin Was 11.74 Gm% With Mean Serum Albumin Being 2.65gm%. 39.3% (259) Patients Succumbed To Their Injuries. It Was Seen That 86% (567) Of These Burn Injuries Were From Preventable Causes. Hence, It Is Imperative To Educate The Masses About Burns Prevention And Safety Measures. A Comprehensive National Programme For Prevention And Care Of Burn Injuries Is The Need Of The Hour, Where It Can Deliver Preventive Education And Health Care At The Grass-Root Level.

**Keywords:** Epidemiological, Burns, Prevention Type Of Article: Original Research Article Category: Plastic & Reconstructive Surgery

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### I. Introduction

Burn Injuries Represent An Extremely Stressful Experience And Is A Complex Devastating Condition Causing An Acute And Long-Term Functional, Psychosocial And Economical Impairment To The Patient And Care Givers. A Global Public Health Problem, According To Who, Burns Account For An Estimated 2,65,000 Deaths Annually [1]. In The Recent Few Decades, Major Advances Have Led To Increase In Survival Of Burns Patients [2]. The Global Improvement In Burns Mortality Has Been Attributed To Several Factors Including Topical Antimicrobials, Early Burn Excision And Grafting, Multidisciplinary Approach And Advances In Critical Care [2]. In spite Of These Advances Burns Continue To Be A Major Challenge Due To Limited Resources, Lack Of Public Awareness And Lack Of Specialist Expertise. In India, Over A Million People Are Affected With Moderate And Severe Burn Injuries Every Year Reports Who [1]. An Epidemiological Study Is The Key Modality To Analyze The Burden, Distribution, Cause, Magnitude And Profile Of Burns In A Population. It Is The First Step In Planning Preventive And Management Strategies And Should Be Used To Establish An Effective Preventive Program And Improve Standard Of Care. In This Study, We Describe The Demographic, Socio-Cultural Aspects Of Burns Patients, Various Etiological Factors And Try To Correlate Them With Outcome. The Aim Is To Aid Recognition Of Preventive Strategies In Future.

### II. Material And Methods

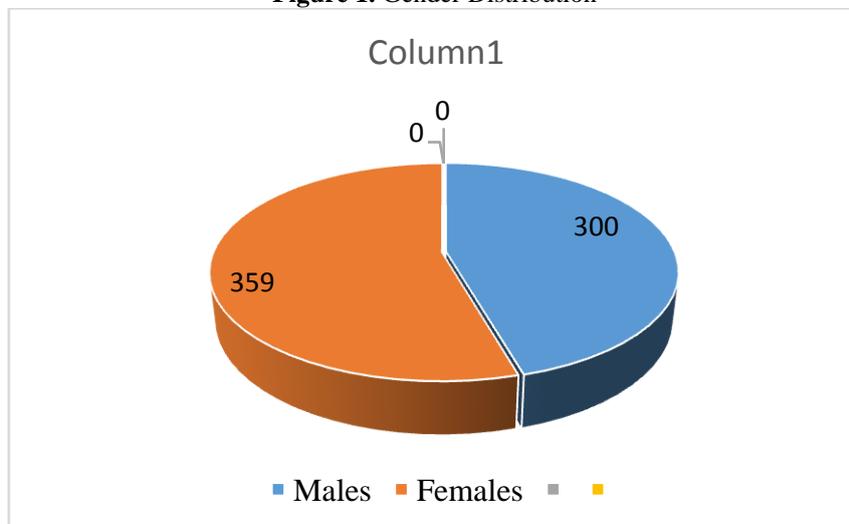
The Research Followed Helsinki Guidelines; 2008 And National Guidelines For Research In Human Subjects; 2006. We Conducted A Retrospective Audit Of Patients Admitted With Burn Injury At A Tertiary Care Burns Referral Centre From 1<sup>st</sup> January 2013 To 31<sup>st</sup> December 2015, Studying Clinical And Socio-Demographic Profile, Etiology, Complications And Management Of These Patients. The Referral Centre Is Run By Dept. Of Plastic Surgery Attached To A Tertiary Care Teaching Hospital. Following Category Of Patients With Burns Injury Are Admitted At Our Hospital With Adults With Total Body Surface Area (Tbsa) Of Burns >10%, Children With Tbsa Of Burns >5%, Burns Involving Face, Hands, Genitals, Perineum, Electrical Burn Patients And Inhalational Burns. On Admission, Tbsa Of Burns Is Calculated Using Lund-Browder Chart. Foley's Catheter And Ryle's Tube Is Inserted And Two Wide Bore Intra-Venous Cannulae Are Secured. Patient's Baseline Weight, All Routine Blood Investigations And Wound Swabs Is Taken For Culture On Admission. Patients Are Given Intravenous Fluids Using Modified Brooke's Formula And Started On Empirical Broad Spectrum Antibiotics And Analgesics According To Institutional Policy. Daily Cleaning Of Wounds And

Dressing Is Done. Occupational Therapy And Physiotherapy Exercises Are Started Early For Patients To Prevent Development Of Long Term Disabilities. Weekly Wound Culture And Routine Blood Parameters Are Monitored. Patients' Are Operated For Skin Grafting, Flaps For Wounds, Debridement Of Unhealthy Tissues, Eschar Removal And Contracture Release. Once Patients Are Discharged, They Are Followed Up Regularly. Socio-Demographic Factors Will Be Assessed With Descriptive Statistics. Means And Standard Deviation Of The Study Will Be Calculated Using Microsoft Office Excel (Microsoft Excel, 2010, Microsoft India Pvt. Limited).

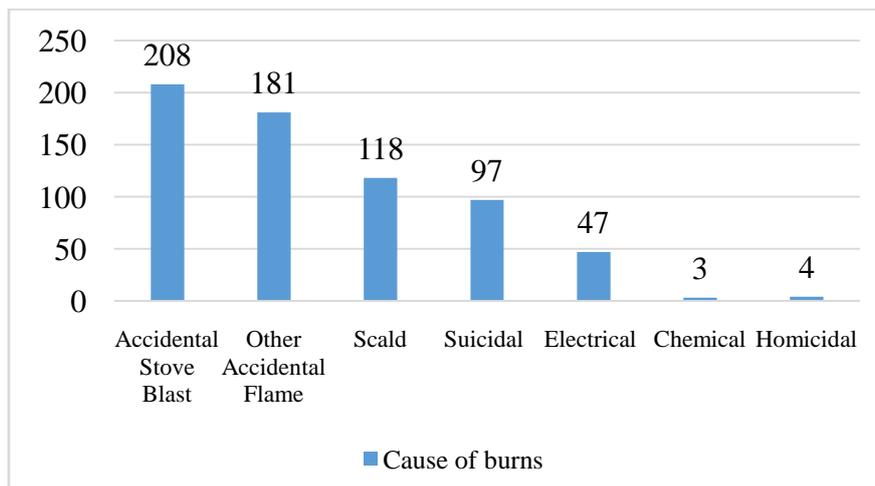
### III. Results

A Total Of 659 Patients Were Admitted In Three Years, In Which Females Were 359 With Male:Female Ratio Of 1:1.2 As Shown In Figure 1. Mean Age Of The Study Group Was 27.7 Years With Most Affected Age Group Being 20-40 Years With 59.2% (390) Patients As Shown In Table 1. Severe Burn Cases Were Admitted With Us With Mean % Tbsa Being 40.7% With Percentage Wise Distribution Shown In Table 2. 81.3% (536) Admitted Belonged To Mumbai Urban Area, Whereas 18.7% (123) Belonged To Rural Area. 41%(273) Patients Were Admitted In Winter Season. Mean Duration Of Stay Was 30.5 Days. Single Most Common Cause Of Burns In Patients Admitted With Us Was Stove Blast As Shown In Figure 2. A Total Of 308 Out Of 508 Accidental Thermal Burns Occurred In And Around The Cooking Area. It Was Seen That 86% (567) Of These Burn Injuries Were From Preventable Causes. 77.8% (513) Patients Were Wearing Cotton Clothes At The Time Of Injury And 18.3% (121) Were Wearing Nylon Clothes. Inhalational Burn Was Present In 363 Patients Out Of 659. Mean Hemoglobin Was 11.74 Gm% With Mean Serum Albumin Being 2.65gm%. 39.3% (259) Patients Succumbed To Their Injuries.

**Figure 1. Gender Distribution**



**Graph 1. Cause Of Burns**



**Table 1. Age-Wise Distribution**

Age In Years	Number Of Patients	Percentage (%)
0-20	182	27.7
21-40	390	59.2
41-60	62	9.4
61-80	24	3.6
>80	1	0.1
Total	659	100

**Table 2. Percentage Distribution Of Tbsa Burns**

% Tbsa Burn	Number Of Patients	Percentage (%)
1-10	40	6
11-20	92	14
21-30	104	15.7
31-40	108	16.4
41-50	120	18.2
51-60	69	10.5
>60	126	19.2
Total	659	100

#### **IV. Discussion**

Epidemiological Studies Such As This Are Central To Planning Health Care Programmes In A Country Like India Which Is Still Largely Dependent On Public Health Schemes. The Study Attempts To Integrate Socio-Demographic, Management And Outcome Profiles Of Burns Patients To Look For A Preventable Pattern In The Burn Injuries.

This Analysis Was Done On 659 Burns Patients Over A 3 Year Period Admitted To A Burn Unit At A Tertiary Care Teaching Hospital In Mumbai, India.

In Our Study Highest Incidence Of Burns 77.4% Was In Age Group Between 15-45 Years With A Mean Age 27.7 Years. This Distribution Is Comparable To Those Found In Other Studies [3-8]. High Incidence In This Age Group Is Explained By The Fact That They Are Generally More Active And Involved In Various Tasks At Home And Work [9-11].

In The Present Study, 54.5% Patients Were Females With Male:Female Ratio Of 1:1.2. These Findings Were Consistent With Other Studies [12-14]. A Major Bulk Of Female Burn Patients Involved Were Housewives Who Spent Most Of Their Time Working In Kitchen. Moreover, Families Belonging To Lower Socio-Economic Strata Were Cooking On Floor With Kerosene Stoves, Wearing Clothes That Easily Catch Fire, Had Stock Or Access To Loose Kerosene And Had Little Or No Awareness Of Safety Measures In Kitchen [15]. A Section Of These Patients Have Psychosocial Etiology In The Form Of Harassment By Husband Or Family, Marital Discord, Dowry Or Domestic Violence. This Age Group Also Involves Newly Married Women Who May Be Victims Of Dowry Deaths. This Can Be The Result Of Harassment By In-Law Family Or Other Physical And Psychological Stresses Of Marriage [16,17].

In The Present Study, Mean Tbsa Burn Was 40.7% With 50% Patients Sustaining Major Burns Involving >40% Tbsa, Which Is Consistent With Other Studies [3,18]. This May Be Due To The Delay In Measures Taken To Douse The Fire Resulting In Patients Suffering From Higher Percentage Of Burns. Another Cause For This Could Be Non-Referral Of Patients With Minor Burns To A Tertiary Care Hospital. The Mortality Rate In Our Study Was 39% Which Was Comparable With Other Studies [3,17]. Out Of 259 Deaths, 237 (91.5%) Patients Had > 40% Tbsa Burns.

In The Present Study, 84.7%(558) Patients Sustained Accidental Flame Burns While 14.7%(97) And 0.005%(4) Sustained Suicidal And Homicidal Burns, Respectively. These Figures Are Comparable To Studies In India [3]. Single Most Important Factor For Accidental Flame Burns Was Kerosene Stove Blast 32%(208), Which Is Commonly Used For Cooking In Lower Economic Strata. This Reflects The Need To Strictly Implement High Standard Safety Norms For Cooking Appliances (Stoves, Gas), Restricting Access To Loose Kerosene And Petrol And The Need To Shift To Other Safer Means Of Cooking Like Gas-Burner, Oven, Etc.

In Our Study We Also Found That Out Of 508 Accidental Thermal Burns 308 Occurred In And Around The Cooking Area. The Different Types Of Burns Seen Were Flame Burns, Scald Burns Due To Spillage Of Water Or Oil, Cylinder Blast. Age Group Affected Was Mainly 1 Year To 40 Years. This Points Towards The Urgent Need Of Creating Awareness About Safety Around Cooking Area. Many Factors Which Contributed To This, In This Strata Of Population, Were Over-Crowding, Lack Of Awareness, Floor Level Cooking, Negligence Towards The Appliances And Negligence Of Children Who Are Allowed To Play In And Around Cooking Area And Loose Clothing (Dupatta, Saree And Loose Gowns) Used By Women While Cooking.

Incidence Of Suicidal Burns Was Higher In Females 55% (53) In Our Study. Suicidal Burns In Married Women Could Be The Result Of Marital Disharmony Or Dowry Harassment Or Domestic Violence, Resulting In Physical And Psychological Stresses [16,17]. Homicidal Burning Of Married Females Is Similarly Common But These May Be Mostly Underreported Due To Fear Or Pressure From The Family [3]. Majority Of Patient 93%(90) Impulsively Poured Kerosene For Suicide. Government Has Taken Good Initiative To Ban Kerosene And Open Access To Petrol In Bottles. Cities Like Chandigarh And Delhi Have Already Become Kerosene Free Cities And Many More Are Phasing Out Kerosene. This Will Help In Long Way To Shift People To Safer Means Of Cooking And Also Restrict People To Impulsively Use Kerosene Or Petrol For Suicides Or Homicides [19].

The Mean Hospital Stay Was Consistent With The Degree Of Burns, With Patients Having >40% Tbsa Burns Having Longer Hospital Stay (Mean Of 57 Days) Amongst Who Survived. This Finding Was Consistent With Other Studies [3]. Patients With Higher Percentage Of Burns Required Multiple Procedures Like Debridement And Skin Grafting.

Patients' Blood Profile Had Effect On The Prognosis. Mean Weight At The Time Of Admission Was 49.8 Kg. Mean Hemoglobin Was 11.74 Gm%. Mean Serum Albumin Was 2.65gm% And As The Severity Of Burns Increased The Serum Albumin Levels Decreased. Mean Serum Albumin Of Patient's <40% Tbsa Was 3.02gm% And Of The Group >40% Tbsa Was 2.25gm%. Hypoalbuminemia Is Associated With Higher Percentage Of Burns And This Finding Was Consistent With Other Studies [20]. Unfortunately, 89% Patients Had Wound Infection During Their Stay. Most Common Organisms Infecting The Wounds Were Pseudomonas Aeruginosa And Klebsiella Pneumoniae.

On An Average, Patients Require 1 Blood Transfusions But The Number Of Transfusions Required Was Less In Patients Who Expired Maybe Due To Shorter Duration Of Survival. Mean Number Of Procedures In The Form Of Debridement And Skin Grafting Done Was 1.76. The Number Of Procedures Were More In Patients Who Had Severe Burns Of More Than 40%.

Limitations Of The Study: Under Reporting Of Exact Causes Of Burns For Fear Of Social Stigma, Small Sample Size, Tertiary Hospital Based Study Which May Not Be Entirely Representative Of The Population.

## V. Conclusion

Burns Remain A Huge Public Health Concern In Terms Of Morbidity And Long-Term Disability [21]. It Is Imperative To Stress On Burn Prevention. It Has To Be A Collaborative Effort From Government And Private Sector To Spread Awareness And Educate The Masses About Burns Prevention And Safety Measures With Strict Safety Norms For Cooking Appliances. A Comprehensive National Programme For Prevention And Care Of Burn Injuries Is The Need Of The Hour, Where It Can Deliver Preventive Education And Health Care At The Grass-Root Level.

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