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RESEARCH ARTICLE

EPIDEMIOLOGY OF BURNS AND ITS OUTCOME IN A TEACHING HOSPITAL - A 10 YEARS STUDY.

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Manuscript Info

Abstract

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Introduction:-

Aim Of The Study

To analyze the following factors

1. Age
2. Sex
3. Marital status
4. Literacy
5. Employment
6. Cause of burns
7. Total percentage of burns
8. Burn type
9. Burn depth
10. Smoke inhalation
11. First-Aid
12. Flame put-out by
13. Time lag (Delay in approaching Burn unit)
14. Duration of stay (No. of days in the Hospital)
15. Outcome
16. Surgeries (SSG, Flap, Debridement, Amputation)

Materials & Methods:-

Place of study:Kurnool Medical College Hospital,Kurnool, Andhra Pradesh, India

Period of study:

Over a period of from January 2009 to December 2018.

Sample size:

11584 Patients

Method of study:

Retrospective study based on Data forms for Burn Injuries .

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Sample selection:**Inclusion criteria:**

1. All In-Patients admitted in Burns Unit of our Hospital from 2009-2018
2. Both sexes
3. All Age groups

Exclusion criteria:

Patients treated on Out-Patient basis

Results & Observations:-

A total number of 11584 patients got admitted from 2009 to 2018, with an average admission rate of 96.5 per month. The parameters as mentioned in Aim of study were studied in detail and are presented below.

Age-Wise Distribution

Least age found in the data was 3months and maximum age was 90years. The data was split into four age groups for comparison (**Table 1**). The number of patients in each group were 2446 (21.1%), 6338 (54.8%), 2151 (18.5%) and 648 (5.6%) respectively.

Sex-Wise Distribution

In this study 45% patients were Males and 55% were Females. The overall Male to Female ratio was 1:1.2 .

Marital Status

Burn incidence in our study was found to be high in Married persons (66.2%) followed by Unmarried (15.7%), Children (18%) and Divorced persons (0.1%) .

Literacy

Burn injuries were more common in illiterates (52.7%), followed by literates (40.6%) and children (6.7%). Literates are further classified into three categories based on their educational qualifications into Low (E.g.: up to 10th class), Medium (E.g.: up to Intermediate) and High (E.g.: up to Graduation)

Employment

Distribution of Burn injury is high in Unemployed persons (54%), followed next in order by Employed (19.8%), Children (12.8%), Student (12.5%) and Retired persons (0.9%)

Etiology (Cause of Burns)

1. Domestic Burn injuries are significantly high in our series accounting for 94% of the total burn injuries. Out of them Accidental burns are 57% followed by Suicidal burns by 42 %. Homicidal burns were 0.6%. Mode of injury could not be established in 12 cases .
2. Non-Domestic Burn injuries (burns occurring at the place of work) have accounted for only 6% of the total burn injuries. Out of them Electrical Burns was 98.5% .

Total Percentage Of Burns

Distribution of patients according to their Percentage of Burns is shown in the following table. It is evident that a large number of patients (52.6%) who got admitted in our Burns unit have sustained burns of more than 50% BSA .

Burn Type

Flame was the predominant cause of burns (73.5%). Electrical burn injury (14%) was the second most common cause with Domestic Electrical injuries accounting for 892 cases (56.2%) while Non-Domestic Electrical injuries are 694 cases (43.8%) of total Electrical Burn injuries. Burns resulting from Scalds, Contact with hot objects and Chemicals are 7.2%, 2% and 0.8% respectively. Causative agent in 294 cases (2.5%) was unknown

Burn Depth

Majority of the patients sustained Deep burns (68.2%), followed next in series by All Superficial (17.8%), Mostly Superficial (11.2%), and Mixed Burns (2.8%) .

Smoke Inhalation

Out of the total 11584 patients in our series Smoke Inhalation was confirmed clinically in 43.7% and was suspected in 45% patients. Mortality was significantly high in Confirmed group (74.7%) and Suspected group (50.6%) as compared to patients without inhalation injury and non-flame burns category .

First-Aid

After sustaining burn injury most of the patients received First-aid in the form of Water (72%) while others were subjected to Ointment (17.5%), Ice (3.8%) or other measures (3%). No First-aid was given in 3.7% of patients

Flame Put-Out By

Following burns the flame was put-out by water in 71.6 % of patients followed by blanket (10.8%), drop roll technique (1.5%), hands (1.1%) and other measures (3.2%)

Time Lag (Delay In Approaching Burns Unit)

It is the difference between time of incident and time of starting treatment in burns unit. It was observed in our study that 9223 patients (84.6%) reported to hospital within first 24 hour). Delay of treatment in burns unit and its effect on Outcome, taking into consideration the Percentage of burns .

Duration Of Stay

Most of the patients who got admitted in our burns unit left the hospital (it includes Discharges, Deaths, and LAMA/Absconding) in the first 10 days (44.6%) followed next in series by 30 days (41.2%). Patients got admitted for a minimum period of 1day to a maximum period of 159 days.

Outcome

The overall mortality in this period was 56.6%. Year-wise Outcome statistics.

Surgeries

Total number of Surgeries performed in major O.T under Anesthesia during the period was 2486. Out of them Skin grafting accounted for 57%, followed next in series by Debridement (16.4%), Amputation (15.6%) and Flaps (11%). . Various flaps which were used in our institute for reconstructing electrical burn injury defects as a primary procedure unemployment (68% - **Table 5**), Suicidal (60%) & Homicidal (78%) causes (**Table 6.1a**).

Total number of Surgeries (**Table 16.1**) performed in major OT under Anesthesia during the period was 2486. Out of them Skin grafting accounted for 57%, followed next in series by Debridement (16.4%), Amputation (15.6%) and Flaps (11%). Minor procedures done under local anesthesia and I.V. sedation like application of Collagen, Fasciotomies, Debridement done at bedside & in dressing room are excluded from this study.

Type and pattern of Amputations are shown in **Table 16.2**. Various flaps which were used in our institute for reconstructing electrical burn injury defects as a primary procedure are shown in **Table 16.3**. Posterior Interosseous Artery flap was the most frequently used flap in reconstruction of electrical burn injury defects of the hand followed next in series by Abdominal Flaps.

Conclusion:-

Burns represent an extremely stressful experience for the victims, their family in particular and the society at large. The management of burn injury costs very high and drains the economy of both the patient and the treating hospital.

The high mortality in our series could be due to higher Percentage of Burns, Deep burns, Inadequate Staff (shortage of Anaesthesiologist, Nursing staff & Theatre Assistants), the absence of effective barrier nursing of the patients which is resulting in Cross-Infection and Septicaemia. The other contributing factors for high mortality include inadequate blood availability, Heavy Workload and Lack of Operation Theatre time.

Effective control of infection is not achieved, owing to the lack of isolation of patients, which is due to the deficiency of infrastructure facilities and the cost of expensive antibiotics.

Economic constraints preclude us from having an infrastructure comparable to the developed world, but somehow comparable survival rates were achieved with conservative line of management despite heavy work load.

A good outcome in a patient is the best motivator for the burn team to continue to strive to improve further.

The problem is very vast but most of them are preventable. We also recommend some measures which could go a long way in minimizing the incidence of this fatal and demanding injury and consequent loss to mankind

1. The kitchen could be safer by cooking on a high platform which is out of reach for kids.
2. Children should be taught the safe use of crackers and electricity.
3. There is a lot of ignorance about the first aid and prevention strategies, leading to higher incidence of major burns.
4. The dictum of "pour water on burns victim" should be canvassed into the public through all possible methods.
5. Replacing kerosene lamps with solar lanterns and kerosene stoves either with LPG gas stoves or Solar cookers
6. The high incidence of burns could be reduced by proper education of people about common causes of burns and their prevention.
7. Guidelines for managing minor burns in the rural set-up are formulated and enforced to reduce the existing heavy workload in the tertiary care hospital like ours.
8. Prevention of Suicidal burns by counseling the patients at different levels viz. Children, Women (especially post-marital), and Anti-stress counseling.
9. Burn prevention programme should be a national programme. This will ensure reduction in the incidence of burns.

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ANNEXURE – I: TABLES & GRAPHS

Table 1:-Age-wise distribution

0 - 15	2446	21.1 %
16 - 35	6338	54.8 %
36 - 55	2151	18.5 %
> 56	648	5.6 %

AGE WISE REPORT

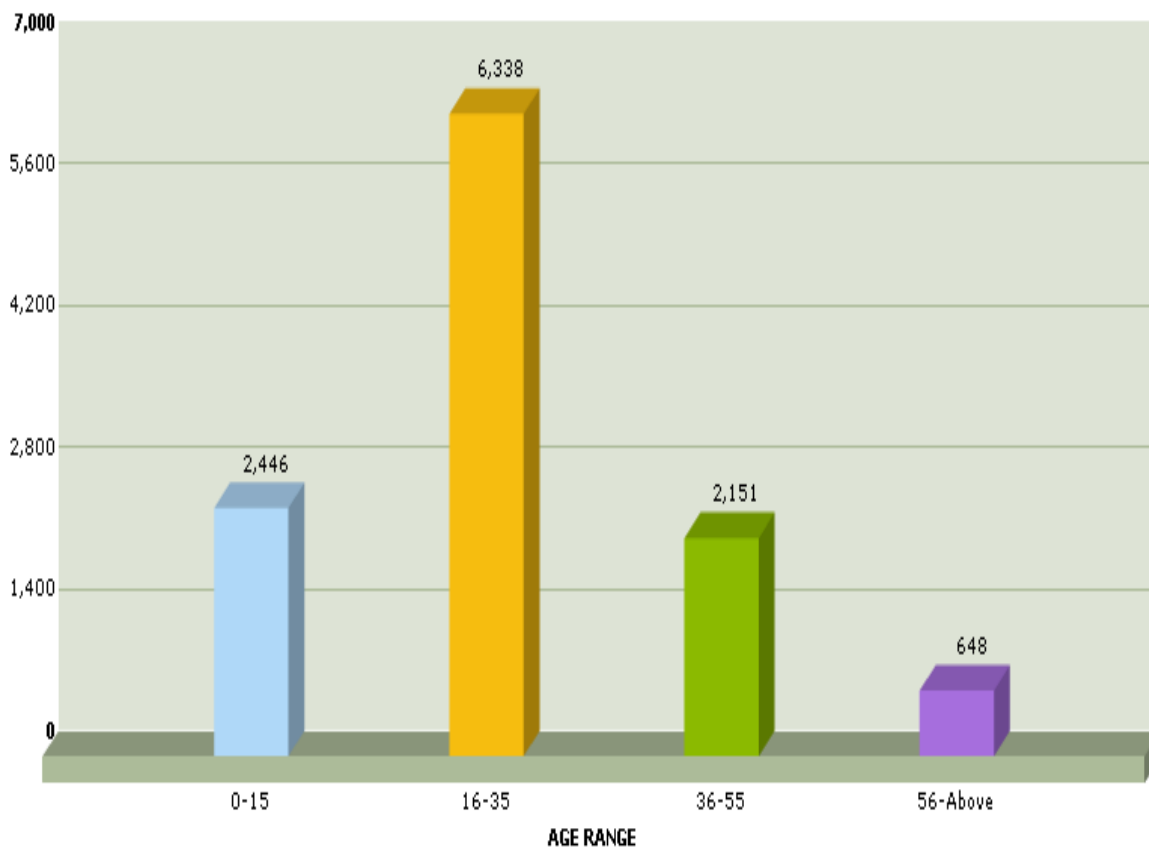
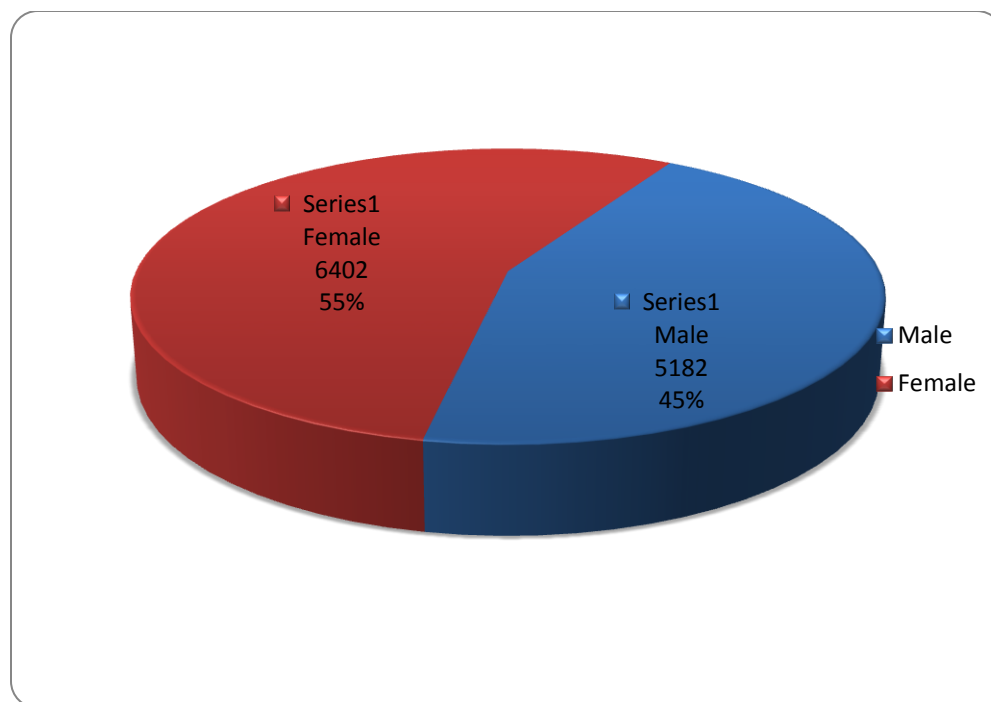


Table 2-Sex-wise distribution

Male	5182	45 %
Female	6402	55 %

**Table 3:-Year-wise Sex distribution**

	888	400	488
	899	338	561
	919	348	571
	1030	370	660
	1040	400	640
	1214	521	693
	1342	637	705
	1414	715	699
	1484	772	712
	1354	681	673
	11584	5182	6402

Married	Male	2999 (39%)	7673	66.2 %
	Female	4674 (61%)		
Unmarried	Male	1014 (56%)	1821	15.7 %
	Female	807 (44%)		
Children		2080		18 %
Divorced		10		0.1 %

Table 4:-Literacy status

Illiterate	Male	2145 (35%)	6105	52.7 %
	Female	3960 (65%)		
Low (Eg:10 th class)	Male	1752 (53%)	3296	28.5 %
	Female	1544 (47%)		
Medium (Eg:Intermediate)	Male	779 (58%)	1354	11.7 %
	Female	575 (42%)		
High (Eg:Graduation)	Male	33 (59%)	56	0.4 %
	Female	23 (41%)		
Children		773		6.7 %

Table 5:-Employment status

Unemployed	Male	1993 (32%)	6265	54 %
	Female	4272 (68%)		
Employed			2283	19.8 %
Student			1452	12.5 %
Retired			111	0.9 %
Children			1473	12.8 %

Accident	Flame	5227 (84%)	6218	57 %
	Electrical	892 (14%)		
	Chemical	99 (2%)		
Suicidal			4587	42 %
Homicidal			63	0.6 %

Table5-Domestic causes of Burns – Sex wise

	No. of Patients			Percentage
Accident	Male	3082 (49.5%)	6218	57 %
	Female	3136 (50.5%)		
Suicidal	Male	1797 (40%)	4587	42%
	Female	2790 (60%)		
Homicidal	Male	14 (22%)	63	0.6%
	Female	49 (78%)		
Unknown	Male	5 (42%)	12	0.4%
	Female	7 (58%)		
Total			10880	100 %

Table 6-Non-Domestic causes of Burns

Electrical	694	98.5 %
Chemical	3	0.5 %
Others	7	1 %
Total	704	100 %

Table 7:-Percentage of Burns

		Survived	Expired
	2586 (22%)	2395	7
	843 (7%)	682	37
	774 (7%)	566	107
	686 (6%)	377	234
	601 (5%)	269	281
	701 (6%)	39	596
	589 (5%)	6	550
	499 (4%)	0	472
	758 (7%)	0	736
	3547 (31%)	0	3537

Table 8:-Burn Type

Flame	Male	3454 (40%)	8517
	Female	5063 (60%)	
Electrical		1586	14 %

Scalds	844	7.2 %
Contact	241	2 %
Chemical	102	0.8 %
Others	294	2.5 %

Table 9:-Burn Depth

All Superficial	2058	17.8 %
Mostly Superficial	1294	11.2 %
Mostly Deep	7899	68.2 %
Mixed Burns	333	2.8 %

Table 10:-Smoke Inhalation

		Survived (%)	Expired (%)
Confirmed	5061 (43.7%)	963 (19%)	3781 (75%)
Suspected	5226 (45%)	2441 (47%)	2648 (51%)
No	956 (8.3%)	665 (70%)	101 (10%)
Not Flame Burns	341 (3%)	265 (78%)	27 (8%)

Table 11:-First-aid measures

Water	8360	72 %
Ointment	2015	17.5 %
Ice	430	3.8 %
None	423	3.7 %
Others	356	3 %

Water	8301	71.6 %
Blanket	1244	10.8 %
Drop roll	175	1.5 %
Hands	134	1.1 %
Not flame burns	1367	11.8 %
Others	363	3.2 %

Table 12:-Time delay

< 24 hours	9223	5688	3535
24 -48 hours	1279	733	546
> 48 hours	389	136	253

Table 13-Outcome details

		Survived	Expired	Absconded/LAMA
	888	432	417	39
	899	285	556	58
	919	315	546	58
	1030	420	589	21
	1040	392	629	19
	1214	438	696	80
	1342	461	777	104
	1414	573	768	73
	1484	600	763	121
	1354	418	816	120
	11584	4334	6557	693

Skin Grafting	1417	57 %
Amputation	389	15.6 %
Debridement	410	16.4 %
Flaps	270	11 %
Total	2486	100 %

Table14-

	28
	3
	1
	3
	6
	2
	1
	16
	6
	3
	1
	18
	8
	1
	4
	3
	5
	2
	3
	26
	6