Study of Medicolegal Aspects of Burnt Cases Admitted to Burn Unit, Assiut university Hospitals: retrospective study

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ABSTRACT

Background: In both developed and developing countries, burns remain a medical, psychological, and economic burden. In Egypt, burns are a serious issue when compared to heart disease, cancer, and traffic accidents. Objectives: Accordingly, this work was conducted to study the medico legal aspects of burnt cases admitted to Burn Unit in Assiut University Hospitals. Subjects and methods: A retrospective study included 730 reports data which were collected from the records during the period from 1 January 2017 to the end of December 2020. Data collected included: age, gender, residence, socioeconomic level, causes of burn, site of burn, duration of hospital stay of victims, fate of cases, and causes of death. Results: There was an increase in the percentage of number of burned male victims which represented (68.9%) than female patients. Most burnt patients were among the age groups of toddlers (1-3 years) and children (4-17 years) with a percentage of (34.2% & 26%) respectively. There was a significant increase of burnt cases in rural areas with a percentage of 64.9%. There was a significant increase of burnt cases among low/very low group with a percentage 59%. The commonest cause of burn injuries encountered in this study was scald (50.5%) followed by flame was followed by scald (42.2 %). Most injuries occurred at home with a percentage of (92.7%). The range of duration of hospital stay for the cases included in the study was 7 days. 84% of burnt cases included in the study are cured while 16% of burnt cases died due to sepsis (43.5%). Conclusion: Infants, toddlers and children are affected more with burns. Males are affected by burns more than females. The most common type of burns was due to scald. Proper preventive measures against burns should be taken in order to prevent burns particularly in children. Recommendations: Medicolegal reports should be attached to the medical report of the patients.

Keywords: burn, Assiut, scald, flame, accidental, suicide.
I. INTRODUCTION

Acute harm to the skin or other organic tissues produced mostly by hot or cold materials, chemicals, electricity, or radioactive radiation is referred to as a burn (Kagan et al., 2013). Burn injury is a common type of traumatic injury, causing significant morbidity and mortality. Because of long hospitalization and rehabilitation, and costly wound and scar treatment, burns are considered among the most expensive traumatic injuries (Sánchez et al., 2007). Burns are considered of medicolegal importance as burn traumas may occur in various forms such as domestic accidents, occupational accidents, negligence or abuse of the elderly or children (Hobbs, 1986). Burn injuries are a global public health issue, with an estimated 265,000 deaths each year (Peranantham et al., 2014). In the world, burn is a common method of suicide and homicide. Following road accidents, falls, and interpersonal violence, it is the world's fourth most prevalent type of trauma (Yadav et al., 2019). Burn injuries have an impact on both the physical and psychological well-being of the victim. Burns can cause deteriorate skin cells, tissues, and organs too (Swaroop Sonone et al., 2020).

The aim of this work is to investigate medicolegal aspects and demography of burn cases admitted to Burn Unit in Assiut University hospitals, over a period of four years starting from the first of January 2017 to the last of December 2020.

II. SUBJECTS AND METHODS

Study design and setting
The present study is Observational retrospective descriptive study carried out in Burn Unit in Assiut University hospitals.

Study population:
The study included 730 reports Data which were collected from the records during the period from 1 January 2017 to the end of December 2020.

Registered data:
Data collected from the records include age, gender, residence, social level, type of burn, site of burn injury, duration of hospital stay of victims, manner of burn, fate of cases, and cause of death.

- Age {infant (<1 year), toddler (1-3 years), children (4-17 years), young adult (18-39 years), middle aged adult (40-59 years) and elderly (>=60 years)}.
- Gender (female or male).
- Residence (rural or urban).
- Socioeconomic level (High/middle& low/very low)
- Manner of burn injury (accidental, suicidal or homicidal).
- Causes of burn (flame, scald, chemical and electrical injury).
- Degree of burn (first, second, third and fourth) (Aydogdu et al., 2021).
- Place of burn (domestic or occupational).
Inclusion criteria:
All cases of burn presented in the emergency units at Assiut University Hospitals during the period from 1 January 2017 to the last of December 2020 which include;
- Recent burns
- All age groups.
- All degrees of burn.
- Patients of different residence and occupations.

Exclusion criteria; Old burn injuries

Statistical analysis:
The collected data were tabulated and analyzed using SPSS version 20 software (SpssInc, Chicago, ILL Company). Results were expressed as frequency and percent for categorical variables and mean ± SD for continuous variables. Chi-square test (χ2) was used for comparing data. P- Value < 0.05 was considered statistically significant.

Ethical considerations:
Ethical approval was obtained from the Ethical Committee of Faculty of Medicine, Assiut University, Egypt with IRB no. 17300644. Consent to participate from participants is not applicable as the data was obtained from the electronic health database.

III. RESULTS
duration of hospital stay for the cases included in the study was 7 days, most cases stayed in hospital for 2-7 days with a percentage of 42.1% of total cases. 84% of burnt cases included in the study are cured while 16% of burnt cases died due to sepsis (43.5%), shock (36%), respiratory tract complications (12%) and electrolyte disturbance (8.5%).

Relation between causes of burn injuries and different age groups included in the study was shown in table (3). The most common cause of burn among infants (<1 year) and toddlers (1-3 years) was scald with a percentage (90% and 85.2%) respectively. While flame was the most common cause of burn injuries among children (4-17 years), young adult (18-39 years), middle aged adult (40-95 years) and elderly (≥60 years).

The accidental manner of burn injury was the most common manner of injury among all age groups encountered in the study as demonstrated in table (4). There was significant difference among the burnt patients as regard age and the place of burn injury, most injuries occurred at home with all age groups included in our study with P-value (<0.001) table (5).

Table (6) demonstrates that there was significant difference among the burnt patients as regard age and the degree of burn as it shows that infants and toddlers commonly presented with second degree burn while the other age groups presented with third degree burn P-value (<0.001).

There was statistically significant difference between age and outcome of burnt cases with P-value <0.001. The percentage of cured infant (<1 year) was 95% of total infant cases while the percentage of cured elderly was 52.2% of total elderly cases table (7).

Table (8) shows insignificant relationship between different age groups and the cause of death. The most common causes of death were sepsis and shock.

There was statistically significant difference between manner of burn injury and sex, table (9) shows that male to female percentage in accidental injuries was 97.8% to 96%. All suicidal cases were female, while most homicidal cases were males.

Regarding the relation between the degree and outcome, there was statistically significant difference as the percentage of died cases with first degree burn those died with fourth degree is 4% to 48.3% table (10).

Figure (3) shows significant positive correlation between degree and hospital stay as fourth degree burn required longer duration of hospital stay.
Study of Medicolegal Aspects of Burnt Cases

Fig. (1): Degrees of burn of the burnt patients at Assiut University Hospitals from years 2017 to 2020.

Fig. (2): Manner of burn injury of the burnt patients at Assiut University Hospitals from years 2017 to 2020.

Table (1): Sociodemographic criteria of the burnt patients at Assiut University Hospitals from years 2017 to 2020 by Chi-square test.

| Variable           | no. (n=730) | %    | P- value |
|--------------------|-------------|------|----------|
| gender             |             |      |          |
| Male               | 503         | 68.9 | <0.001** |
| Female             | 227         | 31.1 |          |
| Age groups         |             |      |          |
| Infants (<1 year)  | 40          | 5.5  | <0.001** |
| Toddlers (1-3 years) | 250      | 34.2 |          |
| Children (4-17 years) | 190      | 26.0 |          |
| Young adults (18-39 years) | 167  | 22.9 |          |
| Middle aged adults (40-59 years) | 58   | 7.9  |          |
| Elderly (>=60 years) | 25       | 3.4  |          |
| Residence          |             |      |          |
| Rural              | 474         | 64.9 | <0.001** |
| Urban              | 256         | 35.1 |          |
| Socio-economic level |         |      |          |
| High/middle        | 299         | 41.0 | <0.001** |
| Low/ very low      | 431         | 59.0 |          |

n= number of cases; *P<0.05 significant ; **P<0.001 highly significant
Table (2): Distribution of the studied patients according to some characters and outcome of the burn by Chi-square test.

| Variable                | no. (n=730) | %    | One-way chi square test | P-value |
|-------------------------|-------------|------|-------------------------|---------|
| Cause of injury         |             |      |                         |         |
| Flame                   | 308         | 42.2 | 550.7                   | <0.001**|
| Scald                   | 369         | 50.5 |                         |         |
| Electrical injury       | 52          | 7.1  |                         |         |
| Chemical injury         | 1           | 0.1  |                         |         |
| Site of injury          |             |      |                         |         |
| Face                    | 206         | 28.2 |                         |         |
| Trunk                   | 359         | 49.2 |                         |         |
| Upper limb              | 381         | 52.2 |                         |         |
| Lower limb              | 268         | 36.7 |                         |         |
| Back                    | 134         | 18.4 |                         |         |
| Buttock                 | 216         | 29.6 |                         |         |
| Place of burn injury    |             |      |                         |         |
| Domestic                | 677         | 92.7 |                         | <0.001**|
| Occupational            | 53          | 7.3  |                         |         |
| Duration of hospital stay (days) | | | | |
| <2 days                 | 74          | 10.1 |                         |         |
| 2-7 days                | 307         | 42.1 |                         | <0.001**|
| 8-14 days               | 161         | 22.1 |                         |         |
| 15-30 days              | 129         | 17.7 |                         |         |
| > 30 days               | 59          | 8.1  |                         |         |
| Outcome                 |             |      |                         |         |
| Cured                   | 613         | 84.0 |                         | <0.001**|
| Died                    | 117         | 16.0 |                         |         |
| Cause of death (n=117)  |             |      |                         |         |
| Sepsis                  | 51          | 43.5 |                         | <0.001**|
| Shock                   | 42          | 36   |                         |         |
| Respiratory tract complications | 14 | 12 |                 |         |
| Electrolyte Imbalance   | 10          | 8.5  |                         |         |

n= number of cases; *P<0.05 significant; **P<0.001 highly significant
### Table (3): Relation between causes of burns and different age groups of the burnt patients at Assiut University Hospitals from years 2017 to 2020 by Chi-square test.

| Cause of injury | Age groups       | p-value |
|-----------------|------------------|---------|
|                 | Infants (<1 year)| Toddlers (1-3 years) | Children (4-17 years) | Young adults (18-39 years) | Middle aged adults (40-59 years) | Elderly (≥60 years) |
| Flame Count     | 4                | 33      | 91       | 114    | 46     | 20      |<0.001** |
| %               | 10.0%            | 13.2%   | 47.9%    | 68.3%  | 79.3%  | 80.0%   |
| Scald Count     | 36               | 213     | 81       | 30     | 5      | 4       |
| %               | 90.0%            | 85.2%   | 42.6%    | 18.0%  | 8.6%   | 16.0%   |
| Electrical injury Count | 0            | 4       | 18       | 22     | 7      | 1       |
| %               | 0.0%             | 1.6%    | 9.5%     | 13.2%  | 12.1%  | 4.0%    |
| Chemical injury Count | 0             | 0       | 0        | 1      | 0      | 0       |
| %               | 0.0%             | 0.0%    | 0.0%     | 0.6%   | 0.0%   | 0.0%    |
| Total Count     | 40               | 250     | 190      | 167    | 58     | 25      |
| %               | 100.0%           | 100.0%  | 100.0%   | 100.0% | 100.0% |

*P<0.05 significant; **P<0.001 highly significant

### Table (4): Relation between manner of burns and different age groups of the burnt patients at Assiut University Hospitals from years 2017 to 2020 by Chi-square test.

| Manner of injury | Age groups       | p-value |
|-----------------|------------------|---------|
|                 | Infants (<1 year)| Toddlers (1-3 years) | Children (4-17 years) | Young adults (18-39 years) | Middle aged adults (40-59 years) | Elderly (≥60 years) |<0.001** |
| Accidental Count | 40               | 250     | 187      | 157    | 52     | 24      |
| %               | 100.0%           | 100.0%  | 98.4%    | 94.0%  | 89.7%  | 96.0%   |
| Suicidal Count  | 0                | 0       | 2        | 5      | 1      | 0       |
| %               | 0.0%             | 0.0%    | 1.1%     | 3.0%   | 1.7%   | 0.0%    |
| Homicidal Count | 0                | 0       | 1        | 5      | 5      | 1       |
| %               | 0.0%             | 0.0%    | 0.5%     | 3.0%   | 8.6%   | 4.0%    |
| Total Count     | 40               | 250     | 190      | 167    | 58     | 25      |
| %               | 100.0%           | 100.0%  | 100.0%   | 100.0% | 100.0% |

*P<0.05 significant; **P<0.001 highly significant
Table (5): Relation between place of injury and different age groups of the burnt patients at Assiut University Hospitals from years 2017 to 2020 by Chi-square test.

| Place of injury | Age groups        | Infants (<1 year) | Toddlers (1-3 years) | Children (4-17 years) | Young adults (18-39 years) | Middle aged adults (40-59 years) | Elderly (>=60 years) | p-value |
|-----------------|-------------------|-------------------|----------------------|-----------------------|---------------------------|----------------------------------|---------------------|---------|
|                 |                   |                    |                      |                       |                           |                                  |                     | <0.001 **|
| Domestic        | Count             | 39                 | 243                  | 185                   | 147                       | 43                               | 20                  |         |
|                 | %                 | 97.5%              | 97.2%                | 97.4%                 | 88.0%                     | 74.1%                            | 80.0%               |         |
| Occupational    | Count             | 1                  | 7                    | 5                     | 20                        | 15                               | 5                   |         |
|                 | %                 | 2.5%               | 2.8%                 | 2.6%                  | 12.0%                     | 25.9%                            | 20.0%               |         |
| Total           | Count             | 40                 | 250                  | 190                   | 167                       | 58                               | 25                  |         |
|                 | %                 | 100.0%             | 100.0%               | 100.0%                | 100.0%                    | 100.0%                           | 100.0%              |         |

*P<0.05 significant; **P<0.001 highly significant

Table (6): Relation between degree of burn injury and different age groups of the burnt patients at Assiut University Hospitals from years 2017 to 2020 by Chi-square test.

| Degree of burn | Age groups        | Infants (<1 year) | Toddlers (1-3 years) | Children (4-17 years) | Young adults (18-39 years) | Middle aged adults (40-59 years) | Elderly (>=60 years) | p-value |
|----------------|-------------------|-------------------|----------------------|-----------------------|---------------------------|----------------------------------|---------------------|---------|
|                |                   |                    |                      |                       |                           |                                  |                     | <0.001 **|
| First          | Count             | 5                  | 45                   | 34                    | 27                        | 9                                | 5                   |         |
|                | %                 | 12.5%              | 18.0%                | 17.9%                 | 16.2%                     | 15.5%                            | 20.0%               |         |
| Second         | Count             | 20                 | 117                  | 81                    | 50                        | 16                               | 6                   |         |
|                | %                 | 50.0%              | 46.8%                | 42.6%                 | 29.9%                     | 27.6%                            | 24.0%               |         |
| Third          | Count             | 13                 | 81                   | 61                    | 64                        | 28                               | 8                   |         |
|                | %                 | 32.5%              | 32.4%                | 32.1%                 | 38.3%                     | 48.3%                            | 32.0%               |         |
| Fourth         | Count             | 2                  | 7                    | 14                    | 26                        | 5                                | 6                   |         |
|                | %                 | 5.0%               | 2.8%                 | 7.4%                  | 15.6%                     | 8.6%                             | 24.0%               |         |
| Total          | Count             | 40                 | 250                  | 190                   | 167                       | 58                               | 25                  |         |
|                | %                 | 100.0%             | 100.0%               | 100.0%                | 100.0%                    | 100.0%                           | 100.0%              |         |

*P<0.05 significant; **P<0.001 highly significant
Table (7): Relation between outcome and different age groups of the burnt patients at Assiut University Hospitals from years 2017 to 2020 by Chi-square test.

| Outcome | Age groups          | p-value |
|---------|---------------------|---------|
|         | Infant (<1 year)    | Toddlers (1-3 years) | Children (4-17 years) | Young adults (18-39 years) | Middle aged adults (40-59 years) | Elderly (>=60 years) |         |
| Cured   | Count 38            | 240      | 165      | 119        | 38          | 13         | <0.001 ** |
|         | % 95.0%             | 96.0%    | 86.8%    | 71.3%      | 65.5%       | 52.0%      |         |
| Died    | Count 2             | 10       | 25       | 48         | 20          | 12         |         |
|         | % 5.0%              | 4.0%     | 13.2%    | 28.7%      | 34.5%       | 48.0%      |         |
| Total   | Count 40            | 250      | 190      | 167        | 58          | 25         |         |
|         | % 100%              | 100.0%   | 100.0%   | 100.0%     | 100.0%      | 100.0%     |         |

*P<0.05 significant; **P<0.001 highly significant

Table (8): Relation between cause of death and different age groups of the burnt patients at Assiut University Hospitals from years 2017 to 2020 by Chi-square test.

| Cause of death | Age groups          | p-value |
|----------------|---------------------|---------|
|                | Infants (<1 year)   | Toddlers (1-3 years) | Children (4-17 years) | Young adults (18-39 years) | Middle aged adults (40-59 years) | Elderly (>=60 years) | 0.54 |
| Sepsis         | Count 1             | 4        | 11       | 23         | 9           | 3          |         |
|                | % 50.0%             | 40.0%    | 44.0%    | 47.9%      | 45.0%       | 25.0%      |         |
| Shock          | Count 1             | 2        | 10       | 16         | 6           | 7          |         |
|                | % 50.0%             | 20.0%    | 40.0%    | 33.3%      | 30.0%       | 58.3%      |         |
| Respiratory tract complication | Count 0 | 3        | 1        | 6          | 4           | 0          |         |
|                | % 0.0%              | 30.0%    | 4.0%     | 12.5%      | 20.0%       | 0.0%       |         |
| Electrolyte imbalance | Count 0 | 1        | 3        | 3          | 1           | 2          |         |
|                | % 0.0%              | 10.0%    | 12.0%    | 6.3%       | 5.0%        | 16.7%      |         |
| Total          | Count 2             | 10       | 25       | 48         | 20          | 12         |         |
|                | % 100%              | 100.0%   | 100.0%   | 100.0%     | 100.0%      | 100.0%     |         |

*P<0.05 significant; **P<0.001 highly significant
Table (9): Relation between manner of injury and gender of the burnt patients at Assiut University Hospitals from years 2017 to 2020 by Chi-square test.

| Manner of injury | Sex                  | p-value |
|------------------|----------------------|---------|
|                  | Male | Female |            |         |
| Accidental       | Count | 492 | 218 | <0.001 |
|                  | % within sex | 97.8% | 96.0% |         |
| Suicidal         | Count | 0 | 8 |         |
|                  | % within sex | 0.0% | 3.5% |         |
| Homicidal        | Count | 11 | 1 |         |
|                  | % within sex | 2.2% | 0.4% |         |
| Total            | Count | 503 | 227 |         |
|                  | % within sex | 100.0% | 100.0% |       |

*\(P<0.05\) significant ; **\(P<0.001\) highly significant

Table (10): Relation between degree of burn and outcome of the burnt patients at Assiut University Hospitals from years 2017 to 2020 by Chi-square test.

| Outcome | Degree of burn | p-value \(<0.001\)** |
|---------|----------------|------------------------|
|         | First | Second | Third | Fourth |          |
| Cured   | Count | 120 | 259 | 203 | 31 |          |
|         | %     | 96.0% | 89.3% | 79.6% | 51.7% |          |
| Died    | Count | 5 | 31 | 52 | 29 |          |
|         | %     | 4.0% | 10.7% | 20.4% | 48.3% |          |
| Total   | Count | 125 | 290 | 255 | 60 |          |
|         | %     | 100.0% | 100.0% | 100.0% | 100.0% |          |

*\(P<0.05\) significant ; **\(P<0.001\) highly significant
IV. DISCUSSION

Burn injuries establish a significant global burden of diseases which are one of the most dangerous conditions encountered in medicine and can be preventable (Al-Shaqsi et al., 2013).

In the current study, there were 730 cases admitted to Burn Unit in Assiut University hospitals during the period from 1 January 2017 to the end of December 2020.

The present study demonstrated that Most burnt patients were among the age groups of toddlers (1-3 years) and children (4-17 years) with a percentage of (34.2% & 26%) respectively. This can be explained by unawareness of children and their exploring nature and activity in addition to lack of proper supervision from parents especially in crowded houses of low socioeconomic classes (Attia et al., 1997). This was in accordance with Heshmat et al. (2014) on their study on burnt patients in burn unit in Tanta university hospital also, the same finding was found by Hassen et al. (2010) in their study on burnt patients in Assiut university hospital burn unit. However, Afify et al. (2012) founded that adult group of age are more affected with burn injury being the age of activity and power with increased risk to exposure to fire followed by children group.

Male predominance was noted in current study with a percentage of (68.9%) where female percentage was (31.1%). This may be due to that Males are more likely to be involved in deadly burn accidents, which might happen at work or at home.

Figure (3): Scatter graph showing relation between degree of burn and duration of hospital stay of the burnt patients at Assiut University Hospitals from years 2017 to 2020.
Furthermore, in the lack of awareness and proper safety procedures, they may attempt to control the fire before the arrival of firemen. This is in accordance with Othman (2010) in Iraq, Kobayashi et al. (2005) in Japan and Tung et al. (2005) in Taiwan which are regarded as industrialized countries.

Female predominance, on the other hand, was reported in most Indian researches, including Chaudhary et al. (2013). This could be owing to inexperience with cooking and the use of dangerous fire appliances, as well as the use of conventional synthetic sarees, which quickly catch fire and spread throughout the body. Intentional burning is also widespread owing to family feuds and dowry issues (Singh, 2017).

It was noticed that cases from rural areas were more than those from urban areas (64.9% and 35.1 respectively). This may be attributed to the basis that rural areas contain inadequate safety measures using traditional kerosene stoves in addition to warming houses by burning wood in cold climate. This finding was in consistent with the results obtained by Shinde & Keoliya (2013) and Akther et al. (2010).

Regarding causes of burn in the present study, scald was the major cause which account for 50.5% of cases this may be due to spilling or immersion in hot water baths, hot liquids and foods, and hot cooking oils. Children are more susceptible to the effects of scalds and acquire more damage at lower temperatures than adults due to their thinner skin.

This result was consistent with Arslan et al. (2013) and George & Abdellah (2017). This was opposite to the findings of Kandeel (2019) who reported that flame was the major cause of burn as many areas of Menoufia governorate are still have no domestic gas systems and still dependent on portable gas cylinders which lack safety measures.

There was statistically significant relation between age groups and cause of burn. Scald was the most common cause of burn among infants which may be due to carless behavior, while flame was the most common of cause of burn injuries among adult and elderly because of their uses of domestic gas stoves in addition to their occupational exposure to burn injuries. This was in agreement with George & Abdellah (2017).

The current study revealed that 92.7% of burns occurred at home. This could be attributed to the fact that the vast majority of burnt patients in the present study were children who spent the majority of their days at home and were at high risk of burn injury. This was in agreement with Hassen et al. (2010) and Hashish & Abdel-Karim (2017). Conversely, Rasouli et al. (2011) in Iran found that occupational burn accounts for most burns may be because of better home safety measures in industrialized countries.

It was noted that, second degree burns were the commonest (39.7 %). This may be due to the high incidence of scald injuries in the current study which usually causes superficial type of injuries. The same finding was observed by Heshmat et al. (2014) who found that second degree
burns were the commonest type of burn in their study in burn unit in Tanta university hospital. Jaiswal et al. (2007) reported that third degree burns were the commonest type of burn in their study in India.

97.3% of cases included in the present study were accidentally injured with burn. While suicide cases accounts for only 1.1% of total cases. This is probably due to the fact that suicide burns are uncommon in Egypt, as evidenced by the low number of suicidal cases compared to accidental instances. This goes against religious principles, as suicide is considered a criminal act against oneself under Islamic law. It could also be attributed to an underestimating of suicidal burn, as incident reporters may not record the exact method of burn for fear of legal responsibility. The same findings were observed Hashish & Abdel-Karim (2017) and Kandeel (2019).

On the other hand, these findings contradicted those of Vidhate & Pathak (2017), who found that the majority of deaths were suicide in origin, followed by homicidal, and finally, accidental. Different lifestyles, beliefs, and civilizations may be to blame for the large disparities. As in India, there was a long-standing dowry issue that drove some women to commit suicide by burning themselves.

Septicemia was the commonest cause of death in the current study due to the hospital acquired infection and the state of immunosupression and systemic inflammation induced by burns. This was in agreement with Harish et al. (2013), Taylor et al. (2014) and (Kandeel, 2019).

On the opposite site Nath et al. (2015) reported that shock was the main cause of death in his study in North east India. Heshmat et al. (2014) on the contrary, observed that respiratory tract complications were the main cause of death.

In the current study, it was reported that Upper limb and trunk are the most common sites of burn with a percentage of (52.2% and 49.2%) respectively. This is may be explained by that the majority of cases were affected by scald which is due to pouring hot liquid from above downwards.

84% of cases included in the present study ended in complete cure. Heshmat et al. (2014) reported 36.9% improvement among burnt cases in Minoufiya University Hospital Burn Unit. Whereas Jaiswal et al. (2007) reported 62.4% mortality rate among studied burnt victims. This difference may be due to difference in manner of injury, facilities and regimens of treatment in every country and in different burn centers. Relation between age groups and outcome showed statistically significant difference as infant, toddler and children showed high percentage of cure compared with elderly patients this may be due to better healing ability in young aged groups in addition to the present of chronic diseases in elderly leading to bad outcome. On the other side, there is no significant difference between outcome and gender.

The current study showed statistically significant difference between the outcome and degree of burn as 48.3% of fourth degrees burn
ended with death due to severe damage of burnt tissues.

There was significant positive correlation between degree and duration of hospital stay as fourth degree burn required longer duration of hospital stay. This is can be explained by their need for longer duration of medical care.

V. CONCLUSION
Infants, toddlers and children are affected more with burns. Males are affected by burns more than females. The most common type of burns was due to scald. Most cases were from rural areas. Most cases were of second degree burn. The commonest place of occurrence of burn injuries was indoors. Most injuries affected the upper limb and trunk. The majority of cases were accidentally affected with burn. The most common cause of death was septicemia.

VI. RECOMMENDATION
We recommend that medicolegal report should be included within the medical reports of the patients with detailed recording of the data as the source of fire, examination of clothes of burnt patients, drug analysis Consultation of Pediatrician for burnt children. Physicians and surgeons should be aware of the medicolegal implications of burn injuries, as well as the significance of meticulously filling out medicolegal reports in all burn cases.

Cooking safety precautions include not having a full fuel bottle near the fire source. To lower the incidence of burn injuries, non-governmental organizations and social groups are required to educate the public about safety guidelines.

VII. REFERENCES
Afify, M. M., Mahmoud, N. F., Abd El Azzim, G. M. & El Desouky, N. A. (2012): Fatal burn injuries: A five year retrospective autopsy study in Cairo city, Egypt. Egyptian Journal of forensic sciences, 2(4): 117-122.
Akther, J., Nerker, N., Reddy, P., Khan, M., Chauhan, M. & Shahapurkar, V. (2010): Epidemiology of burned patients admitted in burn unit of a rural tertiary teaching hospital. Pravara Medical Review, 2(4): 11-17.
Al-Shaqli, S., Al-Kashmiri, A. & Al-Bulushi, T. (2013): Epidemiology of burns undergoing hospitalization to the National Burns Unit in the Sultanate of Oman: a 25-year review. Journal of burns, 39(8): 1606-1611.
Arslan, H., Kul, B., Derebasınlioğlu, H. & Çetinkale, O. (2013): Epidemiology of pediatric burn injuries in Istanbul, Turkey. Turkish Journal of Trauma &Emergency Surgery, 19(2): 123-126.
Attia, A. F., Sherif, A. A., Mandil, A. M., Massoud, M. N., Abou Nazel, M. W. & Arafa, M. A. (1997): Epidemiological and sociocultural study of burn patients in Alexandria, Egypt. Eastern Mediterranean Health Journal, 3: 452-461.
Aydogdu, H. I., Kirci, G. S., Askay, M., Bagci, G., Peksen, T. F. & Ozer, E. J. B. (2021): Medico-legal evaluation of cases with burn trauma: accident or physical abuse. 47(4): 888-893.
Chaudhary, B., Yadav, P., Kumar, M. & Rahul, B. (2013): Mortality profile of burn injuries: a postmortem study in Lady Hardinge medical college, New Delhi. Journal of Indian Academy of Forensic Medicine, 35(2): 123-126.
George, S. & Abdellah, N. (2017): The Medicolegal Aspects Of Burn Cases Admitted To Assiut University Hospitals During Years...
Study of Medicolegal Aspects of Burnt Cases

of 2015 And 2016. Zagazig Journal of Forensic Medicine, 15(1): 60-75.

Harish, D., Kaur, C., Singh, A. & Kumar, A. (2013): A comprehensive analysis of deaths due to burns in a tertiary care centre. Punjab Academy of Forensic Medical Toxicology, 3(2).

Hashish, R. K. & Abdel-Karim, R. (2017): A Study of Burn Injuries in Patients Admitted to the Burn Unit, Suez Canal University Hospital: Medico-Legal Perspectives. Mansoura Journal of Forensic Medicine Clinical Toxicology, 25(1): 79-91.

Hassen, Y., Makboul, M., Taha, O. & Altayeb, A. (2010): Upper Egypt Experience in Management of Paediatric Burn: The Last Six Years. Annals of burns fire disasters, 23(3): 116.

Hobbs, C. (1986): When are burns not accidental? Archives of Disease in Childhood, 61(4): 357-361.

Jaiswal, K. A., Aggarwal, H., Solanki, P., Lubana, P., Mathur, R. & Odiya, S. (2007): Epidemiological and socio-cultural study of burn patients in MY Hospital, Indore, India. Indian Journal of Plastic Surgery, 40(02): 158-163.

Kagan, R. J., Peck, M. D., Ahrenholz, D. H., Hickerson, W. L., Holmes Iv, J., Korentager, R., Krautz, J., Pollock, K. & Kotoski, G. (2013): Surgical management of the burn wound and use of skin substitutes: an expert panel white paper. Journal of burns, 34(2): e60-e79.

Kandeel, F. (2019): A study of Some Medico-Legal Aspects of Fatal Burn Cases Admitted to Menofia University Hospital over Five Years. Ain Shams Journal of Forensic Medicine and Clinical Toxicology, 32(1): 57-64.

Kobayashi, K., Ikeda, H., Higuchi, R., Nozaki, M., Yamamoto, Y., Urabe, M., Shimazaki, S., Sugamata, A., Aikawa, N. & Ninomiya, N. (2005): Epidemiological and outcome characteristics of major burns in Tokyo. Journal of burns, 31(1): S3-S11.

Nath, A., Das, P. & Chakraborty, P. N. (2015): Burnt wives of Agartala: a retrospective study from Medicolegal autopsies of a Tertiary Hospital of Tripura, Northeast India. International Journal of Emergency Trends Science Technology, 2(7): 2842-2846.

Othman, N. (2010). Epidemiology of burn injuries in Sulaymaniyah province of Iraq. University of Nottingham.

Peranatham, S., Manigandan, G. & Shannugam, K. (2014): Forensic approach to a case of death due to burn injury: a case report. International Journal Reseach Medical Science, 2(3): 1-13.

Rasouli, M. R., Zarei, M.-R., Dianat, S., Eslam, V., Harirchi, I., Boddouhi, N. & Zandieh, A. (2011): Factors associated with mortality in adult hospitalized burn patients in Tehran. Turkish Journal of Trauma & Emergency Surgery, 17(1): 61-65.

Sánchez, J.-L. A., Peregóez, S. B., Bastida, J. L. & Martínez, M. M. (2007): Cost-utility analysis applied to the treatment of burn patients in a specialized center. Archives of Surgery, 142(1): 50-57.

Shinde, A. & Keoliya, A. (2013): Socio-demographic characteristics of burn deaths in rural India. International J. of Health care &Biomedical Research, 1(3): 227-33.

Singh, A. (2017): Epidemiology of burn and factors influencing mortality in burn patients in India. International Journal of Enhanced Research in Medicines Dental Care, 4(5): 28-33.
Study of Medicolegal Aspects of Burnt Cases

Swaroop Sonone, Mayuri Kumari & Kumar, A. (2020): Burn Injuries and Its Medicolegal Importance in Indian Scenario. International medicolegal perorter journal 3(2).

Taylor, S. L., Lawless, M., Curri, T., Sen, S., Greenhalgh, D. G. & Palmieri, T. L. (2014): Predicting mortality from burns: the need for age-group specific models. Journal of burns, 40(6): 1106-1115.

Tung, K.-Y., Chen, M.-L., Wang, H.-J., Chen, G.-S., Peck, M., Yang, J. & Liu, C. C.-H. (2005): A seven-year epidemiology study of 12,381 admitted burn patients in Taiwan—using the Internet registration system of the Childhood Burn Foundation. Journal of burns, 31(1): S12-S17.

Vidhate, S. G. & Pathak, H. (2017): A study of medico-legal aspects of death due to burns at a tertiary care centre in Mumbai, India. Egyptian journal of forensic sciences, 7(1): 1-5.

Yadav, P. K., Choudhury, R., Verma, A. K. & Singh, R. R. J. M. L. U. (2019): Correlation of Histopathological Changes with the Manner of Death in Fatal Burns in a Tertiary Care Hospital in Northern India. 19(2): 170-174.
Study of Medicolegal Aspects of Burnt Cases

دراسة الجوانب الطبية الشرعية لحالات الحروق التي تم قبولها بوحدة الحروق بمستشفيات جامعة أسيوط: دراسة بأثر رجعي

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تظل الحروق عبئًا طبيًا ونفسيًا واقتصاديًا في كل من البلدان المتقدمة والناشئة وفي مصر. تعتبر الحروق مشكلة خطيرة عند مقارنتها بأمراض القلب والسرطان وحوادث المرور. بناءً على ذلك تم إجراء هذا العمل لدراسة الجوانب الطبية القانونية لحالات الحروق وعوامل التنبؤ الخاصة بها في وحدة الحروق بمستشفيات جامعة أسيوط.

الطريقة البحثية: دراسة بأثر رجعي تضمنت 370 تقرير وتم تحليل البيانات التي تم جمعها من السجلات خلال الفترة من 1 يناير 2017 إلى نهاية ديسمبر 2020، وتضمنت البيانات التي تم جمعها: العمر، الجنس، والإصابة، والمستوى الاجتماعي الاقتصادي، وسبب الحرق، ومكان الحرق، ومدة مكوث الضحايا في المستشفى، ومصير الحالات، وسبب الوفاة. النتائج: كان هناك ارتفاع في نسبة ضحايا الحروق من الذكور بلغت (9.86%) من الإناث. كان معظم مرضى الحروق من الفئات العمرية للأطفال الصغار (1-3 سنوات) والأطفال (4-10 سنوات) بنسبة (34.2%) و(26%) على التوالي. وسجلت زيادة ملحوظة في حالات الحروق في المناطق الريفية بنسبة (44.9%). كانت هناك زيادة معنوية في حالات الحروق بين المجموعة المنخفضة / المنخفضة جدا بنسبة (69%). كان السبب الأكثر شيوعًا لإصابات الحروق التي تتعرضها في هذه الدراسة هو الإصابة باللبن (14.5%) وليالي الحرق (7.2%). حدثت معظم الإصابات في المنزل بنسبة (96.7%). كان مدى مدة الإقامة في المستشفى للمشمولين في الدراسة 3 أيام. تم شفاء 84% من حالات الحروق المتشملة في الدراسة، بينما مات 16% من حالات الحروق بسبب تعفن الدم (36.5%)، خاصة في البيض (15 سنين). الصغار (3-6 سنوات) يتأثرون أكثر بالحرق. يتأثر الذكور بالحرق أكثر من الإناث (18.9%). كان أكثر أنواع الحروق شيوعًا ناتجًا عن السلق. يجب اتخاذ تدابير وقائية مناسبة ضد الحروق من أجل منع الحروق خاصة عند الأطفال.

النتيجة: تتم التوصية بصورة ضرورية تضمن التقرير الطبي القانوني ضمن التقارير الطبية للمرضى مع تسجيل مفصل للبيانات كمصادر الحرق، وفحص ملابس المرضى المحترقين، وانتشار أطباء الأطفال للمحروقين. يجب أن يكون الأطفال والأطفال الذين يكونون على دراية بالأثر الاقتصادي للإصابات الحرائق، بالإضافة إلى أهمية ماعة التقارير الطبية بثقة في جميع حالات الحروق. مراعاة احتياجات الأمور والعاطفة وضمان متابعة عدم وجود زجاجة وقود مميتة بالقرب من مصدر الحريق تقليل حدوث إصابات الحروق، يجب على المنظمات غير الحكومية والمنظمات الاجتماعية توقف الجمهور حول إرشادات السلامة.