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EPIDEMIOLOGY AND MORTALITY OF BURNS IN IMAM ALI AND AL-KINDI TEACHING HOSPITAL IN BAGHDAD/ IRAQ

Dr. Ahmed Alaa Jalil*[1], Dr. Firas Faeq Jameel[2] and Dr. Asmaa Ali Rifaat[3]

[1]MBCHB- High Diploma Hospital Administration. Ministry of Health, Al-Rusafa Health Directorate, Baghdad, Iraq.

[2]Ministry of Health, Al-Rusafa Health Directorate, Baghdad, Iraq.

[3]MBCHB-Anaesthetist. Ministry of Health, Al-Rusafa Health Directorate, Baghdad, Iraq.

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***Corresponding Author**
Dr. Ahmed Alaa Jalil
MBCHB- High Diploma Hospital Administration. Ministry of Health, Al-Rusafa Health Directorate, Baghdad, Iraq.

ABSTRACT

Background: Despite the progress of the health system, burns remained a problem that cannot be solved or find a way to reduce the complications. All these obstacles are caused by poor health management and lack of financial allocations. **Aims:** to identify the epidemiology and aetiology among mortality cases and comparison between them. **Method:** A retrospective reviewed the records of 559 patients with burn injuries admitted to burns centre of Al-Kindi teaching hospital and Imam Ali hospital in Baghdad during two years (2016-2017). Information was taken from the records admission for each patient, include age, gender, total body surface area, season, cause, and hospital stay. Burned TBSA was classified into four groups: less than 25%, 25.1-50%, 50.1% to 75% and over 75%. In addition, include all the patient was suffering from a 2nd and 3rd degree of burns. All analysis was performed with the Stata version 20. Results were presented as the frequency and percentage and chi-square test. Statistical significance was considered if p value less than 0.05. **Results:** - the majority of mortality cases 470 (84.1%) falls in the age groups less than or equal 37 years old. 489/559 (87.4%) due to a flame agent, followed by 61/559(10.9%) due to hot water, 7/559(1.3%) by electricity and only 2/559(0.4%) by the chemical agent. all cases had a higher percentage in the percentage of burn more than 75.1%, 75. There is a statistically significant relationship between gender and percentage of burn with Chi square^2 =16.2295 and p-value is .001017. **Conclusions:** The mortality among female was more than male. The spring season was the most common of the burn. Flame and hot water are a predisposing factor with higher

mortality of burns. The highest frequency of length stayed in hospital recorded during September, November, October, and June respectively. Regarding the percentage of burn, more than 75% was recorded among the majority of cases. **Recommendation:** Further research in this field to identify the causes and factors that increase the mortality and which could help us in future to put a plans to reduce this mortality.

KEYWORD: Mortality, Burn, Men, Imam Ali, Flame, Length stay, season, Al-Kindi.

INTRODUCTION

Despite the progress of the health system, burns remained a problem that cannot be solved or find a way to reduce the complications. All these obstacles are caused by poor health management and lack of financial allocations.

Burn is an eternal problem of ancient times, with complications and effects that may affect individual and society[1]. The mortality and morbidity as a result of burns had significantly increased from an unusable condition in our country[2].

The degree and the percentage of burning (TBSA) are affecting the course of treatment and the extent of the patient's response to treatment. Also, it is one of the causes of death, within a few hours or after some days because of affecting on multiple organs[3]. As well, the severity of the burn is also sentenced by the amount of body surface area (BSA) involved. There are many factors and motivations that to push people to do it, if intentional or incident, the result is the same[4].

However, Burning with fire and hot water is the most common cause among children and adult people[5]. There are a lot of studies to detect the cause and risk factor, including what is related, what is different[1, 6,7]. Also, some studies are focusing on the burning of chemicals and electricity, which were recorded as work accidents and some as deliberate action due to the conditions of most of the developing countries[8]. For instance, poverty, unemployment are one of the main factors for increasing the mortality among people[6]. In Iran[7], there are many cases recorded among women, due to emotional and domestic violence.

The aimed of this study to identify the epidemiology and aetiology among mortality cases and comparison between them.

METHODOLOGY

A retrospective reviewed the records of 559 patients with burn injuries admitted to burns centre of Al-Kindi teaching hospital and Imam Ali hospital in Baghdad during two years (2016-2017). For Data collection and before starting to collect the data, the ethical clearance was obtained from the Al-kindi teaching hospital and Imam Ali hospital. Out of 1815 cases of burns injury admitted to the burn centre of two years (2016-2017), there were 559 in-hospital deaths. Information was taken from the records admission for each patient, include age, gender, total body surface area, season, cause, and hospital stay. Burned TBSA was classified into four groups: less than 25%, 25.1-50%, 50.1% to 75% and over 75%. In addition, include all the patient was suffering from a 2nd and 3rd degree of burns. All analysis was performed with the Stata version 20. Results were presented as the frequency and percentage and chi-square test. Statistical significance was considered if p values less than 0.05.

RESULTS

Out of 559 patients, the highest frequency of mortality cases 470 (84.1%) falls in the age groups less than or equal 37 years old, while another mortality cases 89 (15.9%) in the age >37. Also in the same table show that the female cases 402(71.9%) was more than male cases 157(28.1%) [Table 1].

Table 1:- Characteristic of cases according to age groups and gender.

Age groups years	Frequency	Percent
≤37	470	84.1
>37	89	15.9
Total	559	100
Gender		
Male	157	28.1
Female	402	71.9
Total	559	100

Relate to **burn aetiology**, in this table shows that the highest frequency of dead cases 489/559 (87.4%) due to a flame agent, followed by 61/559(10.9%) due to hot water, 7/559(1.3%) by electricity and only 2/559(0.4%) by the chemical agent [Table2].

Table 2:- Distribution of cases according to burn aetiology.

Burn aetiology	Frequency	Percent
Flame	489	87.4
Hot water (scalding)	61	10.9
Electricity	7	1.3
Chemical	2	0.4
Total	559	100

Gender and percentage of burn. In 2016, the female cases had higher percentage 113/175 (64.6%) in the percentage of burn more than 75.1%, followed by 31/175(17.7%) in the range 50.1-75%. Also, the male cases had higher percentage 26/71(36.6%) in the percentage of burn more than 75.1% and 21/71(29.6%) in the range 50.1-75%. There is a statistically significant relationship between gender and percentage of burn with $\square^2$ =16.2295 and p-value is .001017[Table 3].

In addition in 2017, also the female cases had higher percentage 137/227(60.4%) in the percentage of burn more than 75.1%, followed by 63/227(27.8%) in the range 50.1-75% and only 1/227(0.4%) in the percentage of burn less than 25%. as well in male cases show that the highest percentage was 32/86(27.2%) in the percentage more than 75.1% and 30/86(34.9%) in the range 50.1-75%. There is a statistically significant relationship between gender and percentage of burn with $\square^2$= 17.0782 and p. value 0. 000681 [Table 3].

Table 3:- Distribution of cases by the year, gender and percentage of burn.

Gender		Percentage of burn(TBSA)								Total	
		<25%		25.1-50%		50.1-75%		>75.1%			
		F	%	F	%	F	%	F	%	F	%
2016	Male	2	2.8	22	31.0	21	29.6	26	36.6	71	100
	Female	3	1.7	28	16	31	17.7	113	64.6	175	100
Chi square^2 is 16.2295 and the *p*-value is .001017											
2017	Male	1	1.2	23	26.7	30	34.9	32	37.2	86	100
	Female	1	0.4	26	11.5	63	27.8	137	60.4	227	100
Chi square^2 is 17.0782 and the *p*-value is .000681.											
Total		7	1.3	99	17.7	145	25.9	308	55.1	559	100

In this table show that the highest percentage of burn falls in the age groups less than or equal 37 and the lowest percentage of the age groups more than 37 years [Table 4]. It is not statistically significant between age and percentage of burn with $\square^2$ =2.53 and p. value 0.4687 [Table 4].

Table 4:- Distribution of cases by the age and percentage of burn.

Age groups years	Percentage of burn (TBSA)								Total	
	25%		25.1-50%		50.1-75%		>75.1%			
	F	%	F	%	F	%	F	%	F	%
<37	5	1.1	81	17.2	119	25.3	265	56.4	470	100
>37	2	2.3	18	20.2	26	29.2	43	48.3	89	100
Total	7	1.3	99	17.7	145	25.9	308	55.1	559	100
Chi square^2 is 2.5363 and the p-value is .468759.										

In 2016, the mortality cases are starting to increase from the (July, April, January, March, September, and November)months and in 2017during the (February, March, May, July, September, and December) months. It also depends on the number of admissions per month [Table 5].

Table 5:- Distribution of cases during two years in Imam Ali hospital per months.

	2016				2017			
Months	**Number of patient during month**	**Number of patient dead during month**	**Percentage of burn for dead patient during month***	**Length stay in hospital for dead patient during month****	**Number of patient during month**	**Number of patient dead during month**	**Percentage of burn for dead patient during month***	**Length stay in hospital for dead patient during month****
January	17	9	%76.1	6	17	5	%79	8
February	26	6	%56.7	5	29	14	%75.4	6
March	25	9	%70.6	7	32	13	%86.5	8
April	35	11	%79.5	5	25	14	%82.5	5
May	31	7	%59.3	6	35	15	%77	6
June	13	5	%79	7	21	7	%81.4	5
July	33	16	%65	9	25	12	%70.8	5
August	26	2	%100	3	18	7	%69.3	8
September	24	9	%82	12	28	14	%81.1	5
October	27	6	%62.5	6	28	6	%76.7	8
November	33	9	%85	6	25	5	%71	10
December	23	7	%85	5	27	11	%78.1	6
Total	313	96	%75.1	77	310	123	%77.4	80

$$* \text{TBSA} = \frac{\#\text{ of percentage of burn for each dead patient}}{\#\text{ of dead patients}} \times 100$$

$$** \textit{lenght stay in hospital} = \frac{\#\text{ of days for each dead patient stay in hospital}}{\#\text{ of dead patients}} \times 100$$

In 2016, the mortality cases of Al-kindi hospital, also it was starting to increase from the (July, September, October, and December) months and in 2017 from the (August, May,

April, September, March, and October) months. It also depends on the number of admissions per month [Table 6].

Table 6:- Distribution of cases during two years in Al-kindi hospital per months.

	2016				2017			
Months	**Number of patient during month**	**Number of dead during month**	**Percentage of burn for dead patient during month***	**Length stay in hospital for dead patient during month****	**Number of patient during month**	**Number of dead during month**	**Percentage of burn for dead patient during month***	**Length stay in hospital for dead patient during month****
January	33	10	72	7	54	10	73	6
February	45	7	80	8	54	13	83.5	7
March	42	12	74	9	66	17	67.6	8
April	49	14	81	4	52	18	74	7
May	43	10	76	6	67	20	76.2	6
June	49	13	74	8	53	15	59	8
July	56	19	76	5	43	14	74	8
August	38	5	65	6	59	22	81.6	6
September	46	18	71	6	47	18	73	7
October	64	15	83	11	46	17	75.6	6
November	44	12	65	4	40	13	78	8
December	49	15	77	9	53	13	77	5
Total	558	150	74.5	7	634	190	74.4	7

$$* \text{TBSA} = \frac{\#\text{ of percentage of burn for each dead patient}}{\#\text{ of dead patients}} \times 100$$

$$** \textit{lenght stay in hospital} = \frac{\#\text{ of days for each dead patient stay in hospital}}{\#\text{ of dead patients}} \times 100$$

DISCUSSION

The aimed of this study to identify the epidemiology and aetiology among mortality cases and comparison between them.

In this study found that the majority of mortality cases 84.1% falls in the age group less than or equal to 37 years and only 15.9% were in the age group more than 37. A study in India[9], they found the mortality of cases (79%) was in the age group of 15-45 years. Also another study in Iran[10], the authors found that median age was 18 years with 58% of the patients under 20 years. This may be referred to a different time to do this study. Therefore the situation unstable and the requirement of service is unavailable in some region led to increasing the mortality.

Gender is considered the most risk factor to increase the mortality among people in this study, we found the higher of mortality among female 71.9% was more than male cases 28.1% and agree with a study in Nepal[11], they found that the mortality among female was more than male patient. also, another study in Iran[7], the authors found that the mortality among female case is more than male. This referred to a similarity in tradition and culture between Asia countries. Also, there are no laws to protect women's rights between countries.

The flame a predisposing factor of higher mortality as most of the deaths in this study occurred in patients with flame 87.4%, (10.9%) by hot water, only (0.4%) by the chemical agent. Another study in Nigeria[12] 2006, the authors found that the flame constituted the largest source of burn, followed by scalding; chemical and electrical burns. Also in China[8], the authors found the highest percentage of deaths due to a chemical agent. This may, however be related to the extent of the burn injuries, which is generally less in scalds than in flames burns; scalds also generally to occur to younger age groups.

In 2016, gender and percentage of burn, in 2016, we detected that the mortality of female had a higher percentage (64.6%) with the percentage of burn more than 75.1%, this result agreed with a study in India[9], they found the female had higher percentage of the higher rate of burn. This referred to the most of these countries are living in unstable and bad condition.

Also, the male cases had a higher percentage (36.6%) with the percentage of burn more than 75.1%, this study agreement with another study in US[13], the authors found that the male has a higher rate of burn. This referred to most of the men are suffering from unemployment and no money and all the pressure on them especially when he has family and the responsibility is too much.

There is a statistically significant relationship between gender and percentage of burn with p-value is .001017. This study disagreement with another study in South Africa[14], the authors found that no gender differences in TBSA. P. value at >0.05.

In addition in 2017, also the female cases had a higher percentage (60.4%) with more than 75.1% of burn. As well in male cases, the highest percentage was (27.2%). Another study in Saudi[15], the authors found that the male cases have a higher percentage than female.

According to age groups and percentage of burn, there is not statistically significant between age and percentage of burn with p. value 0.4687. Unfortunately, we didn't find a similar result to compare with our results.

The burn was more common to all the season's in each hospital, they started from winter (December–February) followed by spring (March-April-May), thus autumn seasons (September–October- November) and for summer (July-August). The number of admissions was higher during March and April months.

In this study, the most common season for burns was a spring which is agreement with the other studies in Iran[10] and Pakistan[16]. Some study reported that the summer and winter were the commonest season of burn injury[6, 8, 12]. On the month-by-month basis, March and April month recorded the elevated of the number of incidents.

The length of hospital stayed is depend on the percentage of burns and the extent of patient response to treatment. In our study found that the highest frequency recorded during September, November, October, June, July, 12,10,11 and 8. Respectively. Compared with another study in Tokyo[17] and India[6], they found the mean length stay was 5 days.

CONCLUSION

The mortality among female was more than male. The spring season was the most common of the burn. Flame and hot water are a predisposing factor with higher mortality of burns. The highest frequency of length stayed in hospital recorded during September, November, October, and June respectively. Regarding the percentage of burn, more than 75% was recorded among the majority of cases. There is a significant relationship between gender and TBSA.

Recommendation: - in this study, we recommended to

1. Further research in this field to identify the causes and factors that increase the mortality and which could help us in future to put a plans to reduce this mortality.
2. Increase the number of medical and health staff because of a shortage of specialized doctors, residents, nursing was recorded in this study.
3. Hold the training and development courses, whether local or international, for all employees in the burns units, in order to develop the skill and gain experience in this field work and to learn about the latest developments and discoveries in the field of burns.

4. Provision of medicines, medical supplies its help of managed burned case.

Conflict of interest: - None

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