Analysis and Description of Suicidal Burns Admitted to Al-Fayhaa General Hospital in Basra, Iraq

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Abstract- Suicide by self-burning remains a common method of suicide amongst women in Iraq and some neighboring countries. This study aimed to describe the problem of self-burning in Basra province and investigate the associated factors. A prospective study was undertaken between October 2016 and May 2017 in Al-Fayhaa Burn Center. Data were collected from all patients admitted to the center for a self-inflicted burn. Sociodemographic information and cause of suicide were obtained using an interviewer-administered questionnaire, and clinical data were transcribed from hospital records. There were 62 cases (females 74%, males 26%) of self-burning during the 6 months data collection accounting for 22% of all burn admission. The age ranged from 9-56 years (mean 25.3, SD 10.8 year). The vast majority had no or only basic education (92%), 55% were married, 60% were from outside Basra city and 53% considered themselves from a poor socioeconomic background. The incident mostly occurred at home (84%) while the person was alone (91%) using kerosene as the burning material (82%). The total burn surface area ranged from 20-100% with a median of 80% (IQR 60-95). The median hospital stay was 5 days (IQR 1-12 days). In-hospital mortality rate was 72.6%. Suicide by self-burning seems not to be uncommon in Basra and require more attention from public health and social services. More research is required to provide a better estimation of the problem and in-depth understanding of the factors that contribute to the problem.

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Introduction

According to WHO, there are more than 800,000 deaths due to suicide in the world every year, 78% of them are occurring in middle and low-income countries. Suicide was the second leading cause of death among young adults (15-49) globally in 2015 (1). Since 1990, the number of suicides has risen globally by 32% among young adults that accounts for 4.8% for females and 5.7% for males (2). In general, self-burning or self-immolation is the leading cause of suicidal attempts in women (3). Sri-lank ranks first amongst the world countries in terms of self-immolation (4) while India has the highest rate of death due to self-immolation. The cause of suicide is different in developed countries from developing ones. While alcohol and drug addiction are common causes of suicide in developed countries, physical and verbal abuse are the main cause in the developing countries (5). About 80% of people committing suicide are females at young age, illiterate, and impoverished (6).

Suicide by self-burning is the most dramatic form of all suicide methods. It is low in developed countries accounting for 0.5-1% of all cases of suicide (7), while it represents the main method in developing countries accounting for up to 40% of cases of suicide (8). Self-burning is considered a burden on the healthcare system as these patients usually have higher TSBA and need longer hospitalization course with high mortality rates as compared to accidental burns (8).

The problem of suicide in Iraq, including suicide by self-burning, seems to be under-estimated and not researched well due to religious and social factors. Since suicide is considered a taboo, people rarely acknowledge it. According to WHO, there were 4.8 deaths due to suicide per 100,000 population in 2015 in Iraq (1). Suicide is reported to have increased considerably after the USA led invasion in 2003 (9).

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In the north of Iraq, suicide by self-burning is a serious problem in women where about five women are committing suicide every day due to family pressures, marital disputes and honor crimes, especially among the Kurdish population (10,11). Studies in the north of Iraq have reported that self-burning represents about 22% of all burn admissions (12,13). The extent of the problem is not clear in other parts of Iraq including Basra city. Although mass media report on cases of self-burning from time to time, there are no published studies about the problem. Basra province, located in the far south of Iraq, is the largest city in the south with more than three million people. Self-burning does not seem to be uncommon in the city. The objective of this study was to describe these burns and investigate the associated factors.

Materials and Methods

Al-Fayhaa burn center is the only center in Basra city. It is attached to Al-Fayhaa general hospitals, and has a capacity of 24 beds. It serves Basra's over 3 million population and it is considered as a referral center for the neighbouring cities including Amara, Samawa, and Nasiriya. The study was approved by local health directorate in addition to the center of research and development of Basra city. The data was collected prospectively during a period of six months from all patients admitted to the hospital. All self-inflicted burn patients admitted from October 2016 to May 2017 were included in the study. Collected data included gender, age, educational level, marital status, place of residence, occupation, living standard, place of burn, burning material, total body surface area (TBSA), length of hospital stay, and the outcome. Confirmation of deliberate self-burring was performed by asking the patient or close relatives during the course of treatment. To maximise accuracy of diagnosis, we followed up the cases with residents and nursing staff day by day. The analysis thus included those cases confirmed directly as self-burning by patients and their relatives as well as those highly suspicious as shown by inconsistent story and high TBSA burn, burn pattern, and behaviours indicating self-burning such as verbal fight between the husband and wife's family. Once the case was confirmed as a suicide attempt, the structured questionnaire was administered. All patients were interviewed directly by the author (Al-Shamsi) after obtaining verbal consent from the patient or carer and reassuring them about ensuring their privacy and confidentiality. Clinical data was transcribed from hospital records. Collected data were entered into EpiData program and analysed in Stata.

Results

There were 62 cases of self-burning during the 6 months data collection period newly admitted to the hospital. Characteristics of the patients are shown in table 1. The total burn admission during the same period was 280 which means that 22.1% of the admissions were for suicidal burns. The self-burning patients included 46 females (74.2%) and 16 males (25.8%). Their age ranged from 9 to 56 years (mean 25.3, SD 10.8 years) and 29% of the patients where children up to the age of 18 years while most (45.2) were aged 19-29 years. The vast majority had no or only basic education (91.5%), 54.8% were married, 59.7% were from outside Basra city and 53.2% considered themselves from a poor socioeconomic background.

The injury characteristics of self-burning patients are shown in table 2. The incident mostly occurred at home (83.9%), and the material used for self-burning was kerosene in 82.3% of cases. Over 91% of patients were alone during the incident which mostly happened during the day between 7 am and 7 pm (59.7%). The total burn surface area (TBSA) ranged from 20-100% with a median of 80% (IQR 60-95). The median hospital stay was 5 days (IQR 1-12 days). In-hospital mortality rate was 72.6%.

Table 3 shows median TBSA by various characteristics. There were no significant differences in the distribution of TBSA between males and females, among various age groups and by the material used for burning. The median TBSA was significantly higher in patients who died compared to those who survived (90% vs. 40%, $P<0.001$).

Table 4 presents analysis of mortality by various characteristics. There was significant difference between female and male in terms of mortality rate (85.7% vs. 56.2% respectively, $P=0.01$). Age group and material used for burning were not significantly associated with mortality. Higher quartiles of TBSA were significantly associated with death. For example, mortality rate was zero when TBSA was below 25% while it was 11% for TBSA 25-50% and significantly higher for higher TBSA ($P<0.001$). Patients who died stayed less in the hospital (median 5 days, i.e. median day for death) with 75% of deaths occurring during the first 8 days of hospitalization.

Family problems including intra-marital problems, disagreements, and quarrels between family members

were the reported precipitating factor in 50 cases (80.6%). Mental health conditions such as depression and psychiatric disorders were reported in 5 cases (8.1%) of participants. Love and disapproved emotional relationships were reported in 5 cases (8.1%). Only 7 cases (11.3%) reported previous suicidal attempts and only 2 cases reported family history of suicide. Majority of the suicides (83.9%) occurred at home and in 91.9% of cases the person was alone when committed suicide. Around 60% of cases occurred between 7 am, and 7 pm and in 82.3% of cases kerosene was used the rests being gasoline and benzene. Forty-one cases (66.1%) were confirmed by the patients/relatives, and 21 (33.9%) remained suspect. Eight patients left a note about their intention.

Table 1. Background characteristics of patients admitted for deliberate self-burning (n=62)

Characteristics		Number	Percent
Sex	**Male**	16	74.2
	Female	46	25.8
Age	**Up to 18 years**	18	29.0
	19 to 29 years	28	45.2
	30 and over	16	25.8
Residence	**Basra city**	24	38.7
	Outside Basra city	37	59.7
	Other provinces	1	1.6
Living standard	**Poor**	33	46.8
	Fair/good	29	53.2
Education	**None**	22	35.5
	Primary/Middle	36	58.1
	High school/ higher	4	6.4
Occupation/role	**Child/dependent**	5	8.1
	Housewife/employed	51	82.3
	Employed	5	8.1
	Other	1	1.6
Marital status	**Never married**	20	32.3
	Married	34	54.8
	Divorced/ widowed	8	12.9
Mean age in years		25.3 (10.8)	

Table 2. Burn characteristics of patients admitted for deliberate self-burning (n=62)

Characteristics		Number	Percent
Place of burn	**Home including yard**	52	83.9
	Outside home	10	16.1
Burning material	**Kerosene**	51	82.3
	Petrol/ gasoline	11	17.7
TBSA burnt	**0-25%**	2	3.2
	25.1-50%	10	16.1
	50.1-75%	15	24.2
	75.1-100	35	56.5
Outcome	**Death in hospital**	45	72.6
	Discharged	13	21.0
	Discharged against advice	4	6.4
Length of hospital stay in days, median (IQR)		5 (1,12)	

Table 3. Total body surface area by sex, age, and outcome of self-burning patients

		% TBSA Median (IQR)	*P*
Sex	**Male**	70 (40-99)	Z=-0.35, *P*=0.72*
	Female	83 (64-95)	
Age	**11 to 18**	80 (55-95)	χ^2=0.07, 2 df, *P*=0.9**
	19 to 29	79 (61-95)	
	30 and over	88 (51-98)	
Outcome	**Survivors**	40 (30-50)	Z=--4.1, *P*<0.001*
	Deaths	90 (74-100)	
Material	**Kerosene**	78 (55-95)	Z=-1.2, *P*=0.23*
	Other	90 (80-95)	

*Mann-Whitney U test
**Kruskal-Wallis test

Table 4. Comparison of patients who died and those survived by various injury characteristics

Characteristics		Survived	Died	*P*
Sex	**Male**	7 (43.8)	9 (56.2)	χ^2=5.8, df, *P*=0.01
	Female	6 (14.3)	36 (85.7)	
Age group	**Below 19 years**	5 (29.4)	12 (70.6)	χ^2=0.7, 2 df, *P*=0.7
	19-29 years	5 (20.0)	20 (80.0)	
	30 and above	3 (18.7)	13 (81.3)	
Material used	**Kerosene**	11 (22.9)	37 (77.1)	χ^2=0.04, 1 df, *P*=0.8
	Other	2 (20.0)	8 (80.0)	
Burn size quartiles	**0-25%**	2 (100)	0 (0.0)	χ^2=037.6, 3 df, *P*<0.001
	25.1-50%	8 (88.9)	1 (11.1)	
	50.1-75%	2 (15.4)	11 (84.6)	
	75.1-100%	1 (2.9)	33 (97.1)	
	Hospital stay in days, median (IQR)	28 (12.5, 40.5)	5 (1, 8)	z=-4.3, *P*<0.001*

*Mann-Whitney U test

Discussion

The bulk of suicide occurs in Asia and account for about 60% of suicide in the world (14). The Middle East and Indian subcontinent account for the majority of cases. Iran ranks first in the suicide by self-burning in the Middle East accounting for about 36% of burn admissions followed by Iraq (15). In the present study, self-burning accounts for 22% of admissions. Studies from the northern Iraqi cities of Mosul and Sulaymaniyah report similar results. (12,13). However, a 45 days' study by Italian Red Crescent in Baghdad, reports that only 8% of admissions were for self-burning (16). This demographic variation may reflect the short term result of Baghdad study. Although the duration of our study was relatively short, the percentage of self-burning is considerably higher than the neighboring countries including Jordan (17), turkey (18) but lower than Iran (15).

A systemic review by Rezaeian (19) shows that suicide is increasing after disasters. Iraq has been suffering a protracted political, security, and economic situation since more than three decades and this probably could explain the cause of high percent of the suicide cases due to various factors such unmet expectations, loss of loved ones, lack of social security,

poverty, and others.

Generally speaking, being young female Muslim from Middle Eastern background is reported as a strong risk factor for self-burning in some populations of the region (20). In our study, females account for about 74% of admissions. This preponderance of female gender could be explained by many theories including the social status of women, forced marriage, marital conflict, lack of support, and relationship problems which are the main causes of committing suicide in our study (88%). A woman may reach to point where she feels depressed, helpless, and neglected then decide to terminate her life or seek attention by setting herself on fire. The psychiatric review shows that generally males are more likely to commit suicide than females. However, females are more prone to try suicide (21). Nevertheless, this is not the case in relation to self-burning in our study and many studies reported from the Middle East where this form of suicide is higher in the female gender. Male, on the other hand, account for 25% of admission; the cause of self-inflicted burns in the male is mainly mental health or relationship issues.

The mean age in our study was 25 years which is similar to the mean age reported in many studies from middle eastern countries including Iraq (12,13), Iran (22), Jordan (23), and Egypt (24), but lower than all studies reported from western countries where the mean age of suicide patients is above 30 (3). The majority of patients in our study was young females, but teenagers under 19 also accounted for 29% of the sample. An 8 years retrospective study from Iran showed only 22% cases of children under 18 admitted as self-inflicted burning (25). Teenage marriage is common in southern Iraq, and this might be partially responsible for some of the cases.

Kerosene was the main material used in the fire accounting for 82% which is similar to other studies from the region, however, in the western world, gasoline is the main offending agent (3). Kerosene is widely used fuel in Iraqi house for heating and cooking purposes and thus readily accessible, especially to housewives. The mean TBSA was 80% which is higher than some studies reporting from Iraq, and other countries in the region except one study from Israel that reported TBSA of 79% which is close to our findings (26). The mean TBSA was higher in females probably due to the nature of their clothes. The mortality rate in our study was high, 72%, as expected from the high TBSA. This is nearly close to mortalities reported from Middle Eastern countries including Iran (27), Israel (26), Jordan (23), but lower than turkey (28). Females who had a higher mortality rate than males (85% vs. 56%). Of 45 patients who died, 75% of them died within the first 8 days of hospitalization.

In conclusion, suicide by self-burning seems not to be uncommon in Basra. The victims are mainly adolescents and young women with lower levels of education who generally suffer severe burns with a very high mortality rate. More research, especially prospective and qualitative studies are required to provide a better estimation of the problem and in-depth understanding of the factors that contribute to the problem.

Strength and Limitation of the study

This study is one of the most comprehensive studies that done in the context of the suicide by burning. All the cases were reviewed exclusively by the author; the confirmation was usually obtained from the patient or their relatives. Some victims denied confession at the admission; however, on the subsequent days of the follow up, they disclosed the suicidal nature of the accident. It is probable that the author missed some cases; for example, those who suffered from more than 90% TBSA burn associated with inhalational injury, and died within few hours after admission, thus there was no time to interview them; moreover, some cases even when they spent a considerable time in the ward, refused to admit the nature of the accident due to social, religious, and legal factors. Finally, the author would like to acknowledge that there are more cases of suicide during the study period than actually reported in this study.

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