

Frequency of acid assault in males among burn patients presenting at Jinnah Burn and Reconstructive Surgery center (JB&RSC), Lahore, Pakistan. A cross sectional study

Tahira Hafeez¹, Farrukh Aslam Khalid², Aqeela Sarwar³, Sidra Tuhid⁴

Abstract

Objective: To evaluate the frequency of acid burn and to explore the underlying aetiological factors among burn patients.

Methods: The retrospective cross-sectional study was conducted at the Allama Iqbal Medical College, Lahore, Pakistan, and comprised data from May 2016 to November 2017 of all patients who suffered burns from any cause. Acid victims were defined as a person exposed to acid burn as a result of accident or assault. A self-developed proforma was used to collect relevant data.

Results: Of the total 279 cases reported, 20(7%) were acid-related, and 13(65.0%) of them were males. Family and property disputes were the major reasons behind assault in 11(55%) cases, revenge in 5(25%) and relationship break-up in 4(20.0%).

Conclusion: Acid calamity was found to be more against men than women.

Keywords: Acid burn, Chemical burn, Epidemiology, Acid assault, Male acid burn victims.
(JPMA 69: 1299; 2019)

Introduction

Acid propelling, also recognised as acid attack, is a kind of violent attack,¹ which means to hurt or torture, or even kill.² The offenders of these attacks most of the time cause victims to blow up corrosive liquids on their faces, burn them, damage skin tissues. It exposes the bone and, at times, it dissolves.³ The most common acids used in these attacks are sulfuric acid and nitric acid. Although hydrochloric acid is at times used, it is less probable to cause injury.⁴ An aqueous solution of an alkaline substance such as sodium hydroxide, a caustic soda, is also used. In addition to social, psychological and economic difficulties, the long-term consequences of these attacks include difficulty in vision and disfigurement of the body and the burden of multiple surgeries.⁵

Since long it has been reported that acid assault is only related to females. This phenomenon has been believed to happen to females in the name of honour, relationship break-ups and revenge-taking. In some parts of South Asia, acid attacks often occur as revenge against women who say no to marriage proposals or sexual advances.⁶ An acid attack is often used to 'punish' the woman if she

refused to earn money for husband and family. This violence is seen in societies where women are considered inferior to men. People are often assaulted because of property disputes. While it is true that females had been the target of this cruel and inhuman action, males nowadays are also seen as acid victims.

In Bangladesh, 3512 were attacked between 1999 and 2013.⁷ This type of violence is occurring all over the world, but it is most common in South Asia. Acid attacks related to crime syndromes are taking place in Pakistan, Bangladesh, Indonesia and western Europe, as well as in Greece and the United Kingdom.⁸ The stalker's intent is often to demean rather than killing the victim. Acid assaults are less reported across the world, especially attacks on men are not reported in many official statistics because they are considered underrated; very few studies are found in this regard. A review of 13 countries was conducted in 2007 which showed 771 cases of acid burn but only 24 cases were reported as assault over 40 years.⁸ Males were more frequently sacrificed in all countries except Bangladesh and Taiwan. In Cambodia, males and females are almost equally⁹ victimised.

The current study was planned to explore the frequency and reasons of acid burn among patients at a tertiary care hospital.

¹⁻³Jinnah Burn and Reconstructive Surgery Center, Allama Iqbal Medical College, Lahore;

⁴The University of Punjab, Lahore, Pakistan.

Correspondence: Farrukh Aslam Khalid e-mail: drfarrukhaslam@gmail.com

Materials and Methods

The cross-sectional study was conducted at the Jinnah Burn and Reconstructive Surgery Centre, Lahore, Pakistan, and comprised records from May 2016 to November 2017 of data related to acid burn patients. After approval from the institutional ethics committee, data was retrieved manually from the hospital records of individual files of every victim using purposive sampling. The study was focussed on acid victims and in-patients were included. Adult acid burn victims of either gender aged >18 years were included in the study. Patients whose primary cause was other burns like flame and chemicals were excluded. Demographic questionnaire was developed in the light of literature and it included gender, age, education, marital status, area of residence, total burn surface area (TBSA), assaulted body parts, assaulted by, and the reason of assault. Data was entered in an Excel sheet. Frequency and percentages for demographic variables, like TBSA, affected body part and reason for assault, were calculated.

Results

Of the 279 cases, 20(7%) were acid-assaulted cases. Of the 20, 13 (65%) patients were males, while 7(35%) were females. Overall, 13 (65%) victims were married (Table 1). All the female victims were aged <40 (range: 18-37 years). However, male victims were aged >30 years (range: 22-55 years). Mean TBSA in males was 23+15% while in females it was 22+14.

Among the males, 6 (46.2%) got assault on face, scalp, arms, chest and back, while 5 (71.4%) of the females had face and arms mutilation. None of the females had lower limbs assaulted whereas 4 (30.8%) of males had lower limbs, like buttocks and the genitoperineal area, involved (Table 2).

Table-1: Demographic profile of subjects with burn.

Demographics	Variables	n (%)
Total Burnt Cases	All kind of burns	259 (92.8)
	Acid Burn	20 (7.2)
Total		279 (100)
Gender (n=20)	Female	7 (35.0)
	Male	13 (65.0)
Total		20 (100)
Marital Status	Unmarried females	3 (15.0)
	Married females	4 (20.0)
	Unmarried males	2 (10.0)
	Married males	9 (45.0)
	Unknown	2 (10.0)
Total		20 (100)

Table-2: Assaulted body part and gender. N= 20 (m=13, f=7).

Assaulted body part (multiple sites involved)	Gender		p-value
	Male n (%)	Female n (%)	
Face	6 (46.2)	5 (71.4)	0.279
Head	3 (23.1)	1 (14.2)	0.639
Arms	5 (38.5)	5 (71.4)	0.160
Neck	3 (23.1)	2 (28.6)	0.787
Abdomen	6 (46.1)	1 (14.2)	0.154
Back	4 (30.8)	3 (42.9)	0.589
Chest	5 (38.5)	4 (57.1)	0.423
Butts	3 (23.1)	0 (0.0)	0.168
Genitoperineal	1 (7.7)	0 (0.0)	0.452

Table-3: Reasons of Assault (n = 20).

Reasons of Assault	Male n (%)	Female n (%)	Total	p-value
Dispute	8 (61.5)	3 (42.9)	11 (55.0)	0.423
Revenge	4 (31.8)	1 (14.2)	5 (25.0)	0.417
Break up	1 (7.7)	3 (42.9)	4 (20.0)	0.061
Total	13 (100)	7 (100)	20 (100)	

Family and property disputes were the major reasons in 11(55%) cases, revenge in 5 (25%), and relationship break-up in 4(20%) cases (Table 3).

Looking at the profile of the accused, 16(80%) were males while only 1(5%) female was among the accused, while in 3(15%) cases the accused was unknown.

Discussion

The study was conducted with the aim of assessing the frequency of acid burn among males in Pakistan because since long this had been understood that this phenomenon only targets females. The study concluded that acid assault was 30% higher in males than females, as reported in recent studies in the United Kingdom and South Asia.^{10,11} In one study, 68.9% of acid burn victims were males.^{12,13}

In the current study, 20 of the 279 burnt cases were acid-assaulted (7%). Countries with highest reported incidence are Cambodia (20%), Iran (11.5%) and Bangladesh (9%).^{14,15}

Across the world, the most reported vulnerable age range for assault is 13-4.¹⁶⁻¹⁸ In the current study 70% victims were aged 18-37 years for both genders. The results of the current study showed that 13 (65%) victims were married and 9(45%) of them were males, indicating that reasons other than emotional, like family dispute, dispute at workplace and rivalry, makes males more prone to be assaulted. For females, the reasons were more emotional and related to break-ups. A study concluded that 71.2% victims were married and in 32.2% cases the attack was

carried out by spouse, which was not seen in the current study.¹⁹ Drug abuse was also not a reason in our findings as reported in other studies.¹⁴

Looking at TBSA, the mean score showed that males had greater TBSA than females. The main aim of the acid attack is mutilation, which is shown by results of this study as mostly upper body parts, like head, face, chest and arm, were burnt in both genders, whereas only one male had the genitopreneal area burnt and this only case was assaulted by a female out of revenge. Face involvement was 71.4% in females in the current study. One study concluded that face was involved in 86.7% of the cases. In other studies face involvement was 78%.²⁰⁻²² Results showed that lack of education may be increasing the incidence of assault as the educational status showed none of the victims had been to school except one female who had graduated.

Most of the victims (55%) were assaulted due to dispute in the family and at workplace, whereas the second most reported cause of assault was revenge. However, only 20% victims were abused due to break-ups and emotional disturbances. These findings are similar to those seen in developing countries.^{8,23} In developed countries, the incidence is low, although there is a recent surge in the United Kingdom, which is related to gang crimes.²⁴⁻²⁶

Though the findings have unveiled the truth, the notable thing is that 80% of the offenders were also men whereas only 5% were females. Similar findings were noted in other studies as well.¹⁴ Thus the irony of the fact is that victims and crooks are both from the same gender, which shows low tolerance among males.

The current study has some limitations which include the secondary nature of the data of only those patients who had non-accidental chemical burns. The data relates to a single tertiary care centre, and the nature of the chemical and source is unknown.

The findings strongly suggest the non-governmental organisations (NGOs) and other organisations need to shift their focus in terms of creating awareness about the male cases, caring and supporting for the victims by providing interventions.

The government should take serious action against the accused and make laws to ensure that the accused are punished. Access to such chemicals should be strictly banned and monitored. Finally, further studies are required to furnish prospective data for statistically significant results.

Conclusion

Acid assault was found to be more common among males than females. Acid burn calamity is not an incident which happens only to females, rather, as the study found, it is more common in males.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

References

1. Karmakar RN. Forensic medicine and toxicology. 3rd ed. Kolkata, India: Academic Publishers; 2010.
2. Cambodian Acid Survivors Charity 2010. Breaking the Silence: Addressing Acid Attacks in Cambodia?, Cambodia Human Rights Portal. [Online] [Cited 2018 June 30]. Available from: URL: [http://www.sithi.org/admin/upload/media/\[2010-05-24\]1230/Breaking%20the%20Silence%20-20Addressing%20Acid%20AttacCambodia.pdf](http://www.sithi.org/admin/upload/media/[2010-05-24]1230/Breaking%20the%20Silence%20-20Addressing%20Acid%20AttacCambodia.pdf) -.
3. Jordan S. Acid attacks: Bangladesh's efforts to stop the violence: Harvard Health Policy Rev 2002; 3: 1-3.
4. Jane W. It was like burning in hell": A comprehensive exploration of acid attack violence. Carolina Papers on International Health. Center for Global Initiatives, University of North Carolina.2013.
5. Mridula B, Khan RM. Loss of face: violence against women in South Asia. London New York: Routledge. Violence against women in Asian societies. 2003: 61-75.
6. Mannan A, Ghani S, Clarke A, White P, Salmanta S, Butler PE. Psychosocial outcomes derived from an acid burned population in Bangladesh, and comparison with Western norms. Burns 2005; 32: 235-41.
7. United Nations. Acid Attack Trend (1999-2013). 2014. [Online] [Cited 2018 July 1]. Available from: URL: http://www.acidsurvivors.org/images/frontImages/Annual_Report-2013.pdf.
8. Mannan A, Ghani S, Clarke A, Butler PE. Cases of chemical assault worldwide: a literature review. Burns 2007; 33: 149-54.
9. Avon Global Center for Women and Justice at Cornell Law School, Committee on International Human Rights of the New York City bar Association, Cornell Law School international Human Rights Clinic, and the Virtue Foundation. Combating Acid Violence in Bangladesh, India, and Cambodia: Avon Foundation for Women. 2011; 1-64.
10. Nita B. India's top court says gov't not trying to stop acid attacks. Thomson Reuters Foundation. 2013. [Online] [Cited 2018 July 1]. Available from: URL: <http://news.trust.org/item/20130709160626-j5dfo/?source=dpaghead>.
11. Combating Acid Violence in Bangladesh, India, and Cambodia. Avon Foundation for Women. 2011. [Online] [Cited 2018 July 1]. Available from: URL: <https://virtuefoundation.org/2011/01/combating-acid-violence-in-bangladesh-cambodia-and-india/>.
12. Vaghardoost R, Kazemzadeh J, Dahmardehei M, Rabiepoor S, Farzan R, Kheiri AA, et al. Epidemiology of Acid-Burns in a Major Referral Hospital in Tehran, Iran. World J Plast Surg 2017; 6: 170-5.
13. Akhtar MS, Ahmad I, Khurram MF, Kanungo S. Epidemiology and outcome of chemical burn patients admitted in burn unit of JNMC Hospital, Aligarh Muslim University, Aligarh, Uttar Pradesh, India: a 5-year experience. J Family Med Prim Care 2015; 4: 106-9.
14. Khoshnami MS, Mohammadi E, Rasi HA, Khankeh HR, Arshi M. Conceptual model of acid attacks based on survivor's experiences: Lessons from a qualitative exploration. Burns 2017; 43: 608-18.

15. Cleary M, Visentin DC, West S, Say R, McLean L, Kornhaber R. Acid burn attacks: Looking beneath the surface. *J Adv Nurs*. 2018 Jan 24. doi: 10.1111/jan.13532. [Epub ahead of print]
 16. Guerrero L. Burns due to acid assaults in Bogotá, Colombia. *Burns* 2013; 39: 1018-23.
 17. Das KK, Olga L, Peck M, Morselli PG, Salek AJ. Management of acid burns: experience from Bangladesh. *Burns* 2015; 41: 484-92.
 18. Ghani S, Mannan A, Kaucer A, Sen SL, Clarke A, Butler P, et al. Facial motion analysis of acid burn victims-Development of a new facial motion impairment index. *Burns* 2007; 33: 495-504.
 19. Farhad H, Naghibzadeh B, Nouhi AH, Rad HE. Acid burn violence in Iran. *Ann Burns Fire Disasters* 2011; 24: 138-40.
 20. Zhang YH, Han CM, Chen GX, Chun JY, Jiang RM, Liu LP, et al. Factors associated with chemical burns in Zhejiang province, China: An epidemiological study. *BMC Public Health* 2011; 11: 746-53.
 21. Waldron NR, Kennifer D, Bourgois E, Vanna K, Noor S, Gollogly J. Acid violence in Cambodia: The human, medical and surgical implications. *Burns* 2014; 40: 1799-804.
 22. Xie Y, Tan Y, Tang S. Epidemiology of 377 patients with chemical burns in Guangdong province. *Burns* 2009; 30: 569-72.
 23. Haque SE, Ahsan H. Human rights violations against women: Acid violence in Bangladesh. *Am J Prev Med* 2014; 46: 216-7.
 24. Grundlingh, J, Payne J, Hassan T. Attacks with corrosive substances are increasing in UK. *BMJ* 2017; 358: j3640.
 25. Tan A, Bharj AK, Nizamoglu M, Barnes D, Dziewulski P. Assaults from corrosive substances and medico legal considerations in a large regional burn centre in the United Kingdom: Calls for increased vigilance and enforced legislation. *Scars Burn Heal* 2015; 1: 2059513115612945.
 26. Twoon M, Tan A, Dziewulski P. Acid attacks: A growing problem in the UK. *Burns* 2016; 42: 1156-7.
-