
The Problem of Acid Violence in Bangladesh

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Abstract

The non-accidental acid burn injury is a horrific form of violence, with the victim often incurring permanent facial scarring and even blindness. Bangladesh has the highest reported world-wide incidence of this crime and various difficulties have been faced by this developing nation in trying to deal with the problem. Measures taken have included foreign-sponsored NGO creation and collaboration with government, investment in burns care facilities and the involvement of outside surgical expertise. This

has led to improvements in the reporting of this crime, increased awareness and long term treatment and rehabilitation. However, the reported number of attacks has increased by 201% since 1999 and further measures should be taken in order to prevent and manage such violence.

Background

The distribution and motive of assault by burning varies worldwide, and is influenced by local industry, social factors,

crime and war.¹⁻¹⁰ The use of acid as an agent of assault has been well documented in history.^{11,12} In 1964, Bromberg noted increasing use of acid with intent to harm referring to the agents as “12-cent pistols”, propelled by “lye-throwers” who could be hired to carry out an attack.¹¹ Although the mortality of such attacks is low, (1.3%)¹³ it subjects permanent physical stigmata in the form of severe facial scarring, visual impairment and blindness.^{14, 15} Equally important are long-term psychological sequelae.¹³ Bangladesh has the highest reported incidence of acid attacks in the world with an explosion in the number of cases since the mid 1990’s.¹⁶ The incidence of acid attacks has risen dramatically in recent years, to an unprecedented 485 cases in 2002¹⁶ (figure 1). This 201% increase over the period 1999-2003 is in part due to the increased reporting of such attacks but is also associated with a real deterioration in law and order and increasing uptake of this method as a choice for assault.²⁴ The majority of victims are female, constituting 73% of victims between 1996 and 2000 with almost half below the age of 18.^{13,16}

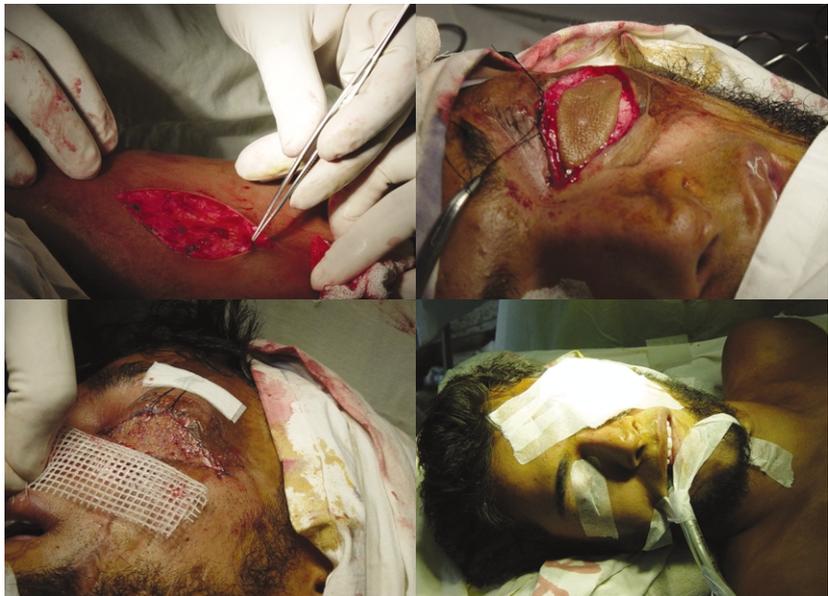


Figure 2a: Obtaining a full thickness graft from the inside of the left arm. 2b and 2c: Placement and grafting of full thickness graft as part of lower eyelid reconstruction. 2d: Completion of lower eyelid reconstruction following acid burns.

Acid burns constitute 9% of burns injuries in Bangladesh.¹³ Common agents are nitric and sulphuric acid, which are readily available, and used in the tanning and dyeing industries, as well as in car batteries.¹³ The target is usually the face, although burns to the scalp, neck and arms are frequent.¹² Burns to the breasts and genitalia have also been reported.¹³ The average TBSA has been reported as 10.84% (range 2-60%).¹³

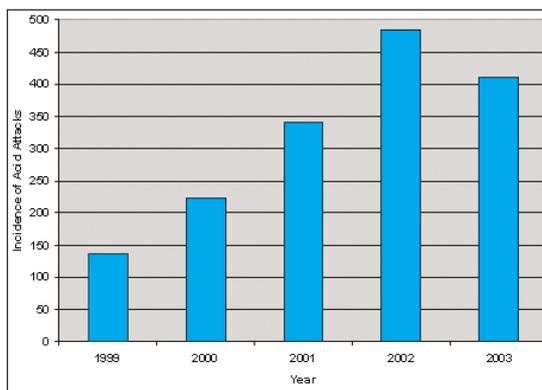


Figure 1. A graph showing the frequency of acid attacks over the period of 1999-2002 (data source: Notification Unit, Acid Survivors Foundation²⁶).

Surgical management varies with the length of delay before presentation and the degree of infection. Patients often present late (average 7.5 - 9 days) when infected burn wounds are common.¹³ With such patients, the wound is dressed and desloughing performed. Granulation tissue is formed, and the wound is then covered with a split thickness graft.¹³ In patients presenting early and where the wound is not colonised by bacteria, the burn eschar is excised with a diathermy knife or scalpel (3 - 5 days post burn), and the wound covered with a split thickness graft, although full thickness grafts are also used to reconstruct eyelids and lips (figure 2). A small number of patients receive meshed skin grafts¹², but use of dermal substitutes is very limited. Long-term complications occurring around and after 6 months post-injury include ectropion of the eyelid, and poorly managed hypertrophic and keloid scars.^{13, 17}

Superficial burns occur after 5 seconds of contact, full thickness burns after 30 seconds.^{3,18} On contact with skin, hydrogen ions react with protein to form acid proteinate, which in turn causes coagulation necrosis.¹⁹ Washing with water causes dilution and elimination of the chemical substance and attenuation of any chemical reaction thereby reducing morbidity.²⁰ Systemic effects such as metabolic acidosis and renal failure may occur if absorbed through the skin.³ The acid burn is liable to damage facial function in the long term, something that can only be partially recovered by reconstructive surgery.

The Acid Survivors Foundation

The Acid Survivors Foundation (ASF) established in May 1999, has been instrumental in tackling the rise of acid violence in Bangladesh (www.acidsurvivors.org)²⁶. It is a Non-Government Organisation (NGO) that collaborates with other NGO’s (Narripokkho, Bangladesh National Women Lawyers Association - BNWLA and Ain O Salish Kendra) as well as the Bangladeshi government to prevent and treat future attacks, and to ensure that survivors have access to medical care and rehabilitation.²⁶

The ASF introduced a nation-wide reporting system in 2001, and also funding for a group of resident plastic surgeons. It heads a 35-bed rehabilitation centre, Thikhana House within Dhaka, and has also opened a 15-bed ward “Jibon Tara” with a fully equipped operating theatre located at the National Hospital for Paralysis in Savar. Treatment is free and is one that could otherwise not be afforded by most of the survivors. A multidisciplinary approach is employed and consists of plastic surgeons, a physiotherapist, nurses, counsellors, clinical psychologist and legal representatives from the BNWLA.²⁶

Survivors face social isolation in addition to psychological trauma and ostracism.¹² Women who have survived acid attacks have great difficulty in finding work.¹² If single, as many victims tend to be, they have little chance of ever getting married,¹² something that inevitably has serious social and economic consequences. The ASF provides survivors with opportunities to continue education, train in new skills and ultimately claim back their independence.

Victims of acid violence are usually young females who have refused the sexual advances, or proposal for marriage of a male

perpetrator.¹³ The vast majority of attacks take place in rural areas, and the typical victim is attacked at night, through an open window.¹³ Knowledge of simple immediate management is low in Bangladesh and victims rarely wash wounds with water - the recommended first step.¹¹ The first port of call is usually a local clinic where burns care facilities are limited, so routine referral is to Dhaka Medical College Hospital (DMCH), often after a delay of several days.¹³ Despite preponderance of this typical story, Bangladesh has recently seen an increase in the number of attacks on males, most of which are related to land and business disputes.¹⁶



Figure 3a, 3b Typical young female victims of acid violence.



3c: The teenager above was attacked at the age of 3 and has presented 13 years later.

Following treatment at DMCH, survivors are transferred to Thikhana House where they undergo rehabilitation and receive help with legal proceedings.²⁶ Long-term management is planned at this stage. The following case studies demonstrate health care initiatives offered to survivors.

Case Study 1: Miss A (24 years old)

In March 2000 Miss A was the victim of an acid attack on her way home from work in a remote village in Sylhet. She is a fully qualified nurse and had just finished work at the local primary care centre. The attacker confronted her colleague, who was with her at the time and subsequently attacked them both with sulphuric acid.

Miss A sustained full thickness burns to the face, neck and shoulders and partial thickness burns to her right arm and hand.



Figure 4. A photograph of Miss A showing extensive facial scarring, asymmetry and deformity, 3 years post injury after surgical treatment

The wounds were irrigated with water one and half-hours after the attack, when she presented to a local health centre. She remained there for 5 days and had her burn wounds washed and simple dressings were applied. She was then transferred to DMCH where she underwent removal of burn eschar and split skin grafting together and was thereafter sent to recover at Thikhana House for a period of 4 months. She was selected by an Italian group of surgeons, in tandem with COOPI (Italian NGO based in Dhaka), to receive further advanced surgical treatment back in Italy. She was flown over and underwent a further 10 to 12 surgical procedures that included split and full thickness autografts, release of burn contractures and eyelid, lip and nasal reconstruction.

On return to Bangladesh, Miss A was employed as a full time nurse by the ASF. She remains unmarried and lives alone in a hostel in Dhaka. Her facial disfigurement remains severe with a Katz²¹ observer rated score of 9 on a recent assessment of facial disfigurement. Recent prosecution of the perpetrator revealed that the attacker was motivated by the refusal of a marriage proposal by Miss A's colleague. Unfortunately for Miss A, she was in the wrong place at the wrong time.

Case Study 2: Miss B (17 years old)

Miss B was attacked 2 years ago at the age of 15, at her home in Bogura. The attacker had recently proposed marriage, which she had refused. Her wedding was subsequently arranged with someone else. Her attacker insisted on revenge and inflicted full thickness burns to the entire right side of her face, neck, shoulder and upper arm while she was sitting by an open window studying at her desk. She washed the burned areas with water within 10 minutes of being attacked.



Figure 5. A photograph of Miss B showing right sided facial scarring 2 years post injury.

Miss B presented to the local hospital 7 hours later from where she was taken to Bogura Medical Centre. She remained there overnight and was then transferred to DMCH and Thikhana House where she received treatment for a period of 1 month. To date she has undergone 4 surgical procedures to her face, the final operation being a lip reconstruction carried out by a visiting British plastic surgeon. Miss B has endured 2 skin graft failures and underwent repeated revision surgery. She is currently completing her O-levels at Thikhana House.

Discussion

Bangladesh has the highest world-wide incidence of acid violence.^{2,13,16} NGO efforts launched in the 1990's have achieved significant gains in raising public awareness and improving medical treatment. However, the number of acid attacks is still high, with the acid burn posing special challenges to the plastic surgeon,³⁰ in a nation where burns care facilities are limited.

In early 2002, the government introduced licensing legislation for the sale of sulphuric and nitric acid, following persistent lobbying by the BNWLA.²² In addition, tougher punishments for perpetrators including the death penalty had been introduced in the hope of reducing the number of attacks.²³ However, the incidence of acid violence continued to rise through 2002, and this has been linked to recent poor law and order in a nation where only 10% of perpetrators are ever brought to trial.¹⁶ Extensive delays in trial proceedings, mismanagement and reported corruption in some elements of the police force are reported to be major contributing factors.²⁴

Before establishment of the ASF, the true incidence of acid violence in Bangladesh was unknown and the issue was poorly publicised in the national media.²⁵ Despite this, it was a recognised phenomenon allegedly unique to Bangladesh. A handful of international charities sponsored some of the few known survivors, giving them the opportunity to be treated abroad, in Europe and the United States. The initiation of the ASF yielded a more honest and responsible approach. In cooperation with the Bangladeshi government, it openly admitted the problem of acid violence and set up a successful nation-wide reporting system,¹⁶ which ensured that all victims are accounted for and receive treatment and counselling.

The ASF also brought plastic surgeons from the UK and America to operate on survivors in Bangladesh, a far more economical option than sending patients abroad.²⁶ It is also a precious training opportunity for local surgeons and has allowed for the development of a multidisciplinary team-based care initiative. Good integration of the host and technically experienced foreign surgeons has produced good results and helped local services to progress towards permanently high standards.

Surgical treatment in Bangladesh is presently far behind that of the developed world. It is generally accepted that where facilities allow, a policy of early operation for deep burns is preferred.²⁷ A desired move towards early intervention, in order to improve healing and reduce scar formation as well as reduce the number of revisions, has proved very difficult to achieve.¹³ Delayed presentation to hospital (on average 7.5 and 9 days respectively for men and women), a lack of technical skill, poor national health service infrastructure and a lack of plastic surgeons are all to blame.¹³ This has in turn compromised optimum acute treatment for survivors. Techniques such as early tangential excision of skin grafting and meshing are not widely used.¹³ The use of microsurgical techniques, hyperbaric pressure chambers, cadaveric dermis and cultured autografts of keratinocytes are virtually unheard of.¹³

Hypertrophic scarring is relatively common amongst survivors following surgery and notoriously difficult to treat.¹³ Regular steroid injections and revision surgery are expensive and do not

always lead to improvement.²⁸ Application of pressure through lycra garments has been shown to be useful.²⁷ The ASF, with the help of a physiotherapist from Queen Victoria Hospital, UK, have established an in house pressure garments lab producing lycra pressure garments at Thikhana House.²⁹ Several victims have been trained in the production of pressure garments. This novel practice serves a dual purpose of preventing potential hypertrophic scarring in recently operated patients as well as providing survivors with a source of income.²⁹

Despite limited surgical treatment, patients receive extensive counselling and are kept in a conditioned environment that allows them to adjust more easily to their circumstances.²⁶ The ASF is an example of a very accomplished multidisciplinary team care provider in a developing country. Improved training of domestic plastic surgeons is also expected in Bangladesh, with the introduction of a new plastic surgery postgraduate training program.³¹

Conclusion

Acid attacks are still occurring in Bangladesh in unprecedented numbers.¹⁶ Positive efforts have been made in the form of efficient and creative NGO establishment and collaboration with government and this may explain in part the 14.5% decrease in the incidence of acid attacks in 2003.²⁶ Dedicated efforts have also been made to increase the capacity of surgical burns care by way of creating new wards, facilities and units, and also direction of foreign surgical expertise and training. Ultimately, although constructive measures have been developed to optimise the management of "acid violence", prevention is the key. The judicial system remains the crucial interface in fighting acid violence. New legislation and acts of parliament have only temporarily succeeded in curtailing the affliction. Future direction should be organised towards, reviewing and correcting failings in policing, judicial and healthcare environments if the problem of acid violence is ever to be solved in Bangladesh.

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The problems of establishing modern cleft lip and palate services in Bangladesh

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Abstract

There are approximately 300,000 cleft lip and palate (CLAP) sufferers in Bangladesh amongst a population of 120 million. The vast majority of these patients cannot afford and do not have access to even basic surgical repairs or cleft related services. CLAP care in Bangladesh is compromised by the lack of a coordinated multidisciplinary care package (MDT) and a shortage of adequately trained surgeons. In January 2002, the Mobile Cleft Lip Camp was set up to address this shortfall. Subsequently camps have been held throughout the country and a total of 467 patients have been operated on over the last 2 years. The mobile cleft lip camp differs from the majority of other surgical camps in that it is run completely by local Bangladeshi doctors and nurses. Despite their best efforts the Mobile Cleft Lip Camps are not the solution to Bangladesh's CLAP problems. CLAP services are far behind those of the UK. They are in need of quite dramatic modernisation. For the long-term benefit of the 300,000 CLAP sufferers it is important that international organisations, groups and individuals help local medical staff to establish a Bangladeshi Cleft Lip Board and set up an MDT care package suited to the needs of the local CLAP population.

Background

Clefts of the lip, alveolus, hard and soft palate are the most common congenital abnormalities of the orofacial structures¹. The abnormalities in cleft lip are the direct consequence of disruption of the muscles of the upper lip and nasolabial region. Unilateral cleft lip is the result of nasolabial and bilabial muscle ring disruption on one side whereas bilateral cleft lip is the result of symmetrical defects¹. Cleft palate is the result of incomplete fusion of the palatine shelves confined to only the soft palate, only the hard palate or both.¹ Patients suffering with CLAP tend to have impaired hearing (chronic otitis media), speech difficulties, misaligned dentition and many require quite advanced orthodontic management in tandem with good primary, and if necessary revision surgery.¹ They frequently occur as isolated deformities - non-syndromic CLAP - but can be associated with other medical conditions.¹ The genetics of non-syndromic CLAP have still not been defined but are thought to be the result of a broken genetic circuit and hence there are a series of defects with particular attention to the orofacial cleft genes.²

The incidence of cleft lip and/or palate (CLAP) tends to be much higher in the developing world compared to the developed.

The incidence in the UK and US is approximately 1 in 700 as opposed to 1 in 500 in regions of Africa, Asia and South America.³

⁴ Bangladesh has between 275,000 and 300,000 people currently living with CLAP amongst a population totalling almost 120 million⁵. This equates to just over 1 child in every thousand families. The vast majority of these sufferers make up the destitute and poorest segments of society⁶.

The problem is exacerbated by the majority of sufferers being unable to afford the appropriate surgical treatment, a significant lack of skilled surgeons able to carry out the necessary procedures (there are currently only¹³ plastic surgeons working in Bangladesh), under funded and poorly equipped hospitals, together with social isolation.⁶

Bangladesh has been the beneficiary of numerous volunteer missions where surgeons, notably from the US, Europe, Japan and South Korea, have performed surgical camps for patients suffering from a variety of orthopaedic, ophthalmic as well as plastic surgical complaints.⁷ The majority of these camps have also delivered an educational element and have helped some way towards the training of local surgeons. This in tandem with an increased involvement of host surgical trainees has helped to inspire enthusiasm from local health authorities.⁸

The Mobile Cleft Lip Camp

In January 2002, the Mobile Cleft Lip Camp was set up to address the increasing numbers of CLAP sufferers, with the 1st of a total of 32 camps, being held at the Nawabgonj Thana Health Centre (THC - Primary Care Centre) within the outskirts of the capital Dhaka.⁹ A total of 9 patients were operated on at this camp, of which, 7 had cleft lip repairs (4 under general anaesthesia and 5 under local anaesthesia).⁹ Subsequently camps have been held throughout the country (figure 1) and a total of 467 patients have been operated on over the last 2 years. Amongst them, 433 individuals received cleft lip repairs with the remaining 34 patients being operated on for a variety of other conditions comprising tongue ties, marjolin ulcers, naevi, neurofibromas, polydactyly and papillomas.⁹ Unfortunately details of re-repair rates and fistula formation are very scarce as follow up of patients is extremely difficult.