



Review Paper

Role of Forensic Science in cases of Acid Attacks

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Abstract

Acid Attack (Vitriolage) is a heinous crime which rising with a considerable number in India, which makes it important topic to be studied in a multi-disciplinary manner. The Author in this paper focuses and try to discuss the area of forensic science and its role in case of acid attack. The first segment of this paper focuses on the role of Forensic medicine in indicating the nature of acid used in acid attacks. The Author studies the effects of such attacks, prescribed treatment and the symptoms which can be used by the medical experts in this section of the paper. Further, the paper also deals with the analysis and role of an investigating agency concerning toxicology in cases of attacks. This section deals with investigation techniques which can be used to find the perpetrator. Ultimately, the paper deals with the legal aspect of acid attacks by analysing the legislations and the judicial precedents and deals with lacunas in the policies of the government.

Keywords: Acid Attack, Forensic medicine, Investigation, Nature of acid, legal aspect.

Introduction

With the rise of crime rates in India,¹ Gender-based violence/ crimes emerged as the most recent category of offences. Maybe, this is one of the reasons that there is a rise in issues of women empowerment or the ideology of new feminism. Still, parallel it's flabbergasting that there has been a rise in crime rates all over the world, especially India and that too in respect of rape, assault, molestation, racial attacks, dowry death, trafficking, harassment, staking etc². And out of these heinous crimes, Vitriolage /Acid attack is another foremost rising crime³ which deserves a separate chapter in itself, which still personifies the patriarchy and idea of women as property of men in India.

Vitriolage is derived from the word vitriol, which means sulphuric acid⁴ and it represents an act of throwing vitriol. It is a meticulous act of projecting acid on the human body to mutilate the face or other body parts, which results into face burn, complete disfigurement, burning of the skin, hairs or other body tissues and may in some cases lead to burning of bones as well⁵. The Forensic science in such a heinous crime steps up, in two forms, firstly forensic medicine; which is more victim-based approach as it deals with treatment, the injuries and most importantly the poison/toxic substance used in the crime. Secondly, the forensic investigation; which gives a holistic perspective as to evaluation the crime scene, collection of evidence and most importantly, to prove the accused guilty.

Research objective: The Author by this research will try to do detailed study as to the involvement of forensic science in cases of acid attacks. The Author majorly focuses on the curative effects/consequences of throwing the acid on the victim and

what's the approach of judiciary and legislature on acid attack cases in India.

Research Question: The Author in this paper will try to evaluate the: i. The role of forensic science in case of acid attacks (Vitriolage) in particular reference to forensic medicine. ii. To find the different kinds of acids used in attacks and what are their effect on the human body. iii. The treatment in case of acid attack and downfall in the lives of acid attack survivors. iv. To analyse the link between forensic science and investigation in case of acid attack. v. To analyse the Medico-legal aspects of Acid attacks.

Hypothesis: The government should ban the sale of acid in medical stores, and a monopoly of government can be pitched to sell acids. This should be done to reduce acid attacks and for proper maintenance of the records.

An implementation mechanism/agency should be set up by the government as recommended by the 226th Law Commission report to deal with the centric and speedy investigation so that Justice can be served in less time.

Awareness amongst the people need to be created as to the effects and the cost of the treatment in cases of acid attacks, to impact the cognition of people.

Methodology

The Author has adopted doctrinal and descriptive research methodology in this research paper. Reliance has been placed on several books, journals, articles, internet sources, the

government provided data, newspaper clippings, Judicial pronouncements etc. for developing a holistic perspective as to the current issue of acid attacks.

Literature review: The Author has placed reliance on Thomas⁶ and Patel⁷ to find out the reasons of acid attacks in India and to substantiate the point that acid attack is a gender-based crime, mostly targeting the women and occur due to patriarchy and male ego.

Gautam Biswas⁸ and Gilli Parvely⁹ work is used to study the forensic medicine and toxicology of the acid attack and for identifying the effect and treatment of acid attacks.

The work of Ajita Tandon¹⁰ and records of Home Ministry of India, National Crime Record Bureau¹ has been used to point out the rise of the crime of acid attack in India and to discuss the legal aspect of acid attack.

Acid Attack: Acid/ Corrosive Poison: Corrosive poison or acid is a chemical substance which has the properties of neutralizes and alkalis. Inorganic/ Mineral acids are those which produce coagulative necrosis, precipitate proteins with resultant hard eschar or scab, these have no remote action and act as irritants when slightly diluted, but as stimulants when well diluted⁸. Acids usually cause second degree, deep partial-thickness burns, tends to demarcate and are dry, hard and mildly oedematous. The Sulphuric acid is most commonly used acid for acid attack and besides its Nitric acid, Hydrochloric acid Carbolic acid, caustic soda, caustic potash, iodine, marking nut juice or Calotropis are also some other chemicals used in the commission.

Reason/ Cause of Acid Attack: The reason for this crime is usually motivated by spurned love and affection, sexual jealousy, economic or land disputes, dowry, hate or revenge. These reasons can be classified into four categories, *firstly* cultural arising out of inequalities in society, *secondly* social which stems from male dominance, an ideology of punishing women, *thirdly* situation occurring due to emotional reactions or the peer pressure sometimes and *lastly*, personal reasons of the perpetrator such as problems in upbringing, neglect by parents, ego issues, anger management issues etc¹¹.

Further, it needs to be noted that, the intent is not to kill the victim; instead it is to give her/him a painful life and to shattering the self-confidence, or burning the beauty of the victim. The Author also believes that in India this emotion of hatred of accused is facilitated by easy and cheap availability of acids, the traditional perception of women, changing gender roles¹², influence from media, the notion of shame, loss of honour etc.

Forensic medicine and Acid Attacks: The discipline of forensic medicine plays a crucial role in assessing the nature of the acid used for the attack which facilitates the treatment of the

victim and helps the investigation team to find the perpetrator in case of unknown accused/ Zero FIR cases. Its role is to identify the acids used for the commission on crime; based on the characteristics of burns, or the postpartum report in case of death and to layout the essential prescribed treatment by the doctors in case of such attacks.

The medical fraternity receives many cases of burns in their practices, so they often need to distinguish acid burns from others. Therefore, it's crucial to study the features of acid attack burns, which help them to stand out.

Characteristics of Burn (Effects on body)⁸: i. In acid attacks, there is discolouration and staining of skin and clothing's (brown or black in sulphuric acid and yellow in nitric acid). ii. There are Trickle marks on the part which come into direct contact of acid. iii. There are usually Painless burns with an absence of vesication and red line on demarcation. iv. The forensic experts or the investigators can also trace the presence of chemical substance in the stains. v. The Repair of the affected area is slow, and Scar tissues cause contractures.

In case of an acid attack, the hospital/ clinic/ doctor must take immediate cognizance and treat the victim, to control the harm as the acid attacks usually cause second or third-degree burns which burn the skin, tissues, vessels and nerves; resulting in melting of the particular part of the victim.

Treatment options¹³: There are two kinds of treatment options short term dealing with immediate actions required to be taken by the doctors and long term, which deals with aftercare.

Immediate treatment: i. Wash the part with plenty of soap and water to fade the burning sensation of the victim. If it's not washed correctly, then it can penetrate into the skin and affect the organs. ii. Application of a thick paste of MgO or Carbonate rather than any other cream. This paste is applied to minimize the burning sensation and stop the effect of the melting of tissues and skin to some extent. iii. Cover raw surface with antibiotic ointment and loosely wrap a sterilized gauze on the burn to protect it from air, dirt and any other kind of contamination. iv. In case of eye burns, the conjunctiva and corneal surface are anaesthetized with topical anaesthetic drops (Proparacaine) and irrigated with water for 15 minutes holding the eyelids open, repeat irrigation using 0.9% saline, till pH is near 7.0. Eye drops containing antibiotics and steroids is advisable.

Long term treatment: i. The long term or continuous treatment involves surgery of the affected part, either Plastic/ reconstructive surgery¹⁴ which is done to correct the affected part and Graft surgery which mean to take skin from any other section and attach it on the burned part. ii. Physiotherapy is also advisable as the acid damage the tissues and nerves, and in such case, it's essential to train the nerves, so it doesn't lead to permanent disability. iii. Besides the above two options

maintenance of the skin to settle the tissues, application of coconut oil or gel sheet on the burned area and wearing pressure garments are some other advisable methods¹⁵.

Consequences of Acid Attack: The most immediate result of acid attack is the erosion of the skin, tissues or muscles, cause extreme pain and injuries¹⁶, causing blindness¹⁷ In case it comes into contact with eyes, destroys the nose cartilage and closes the nostrils etc⁹. And if the acid not washed correctly, it can harm organs of the victim and in some cases can lead to death¹⁸.

In some cases, the victim can inhale the acid, which causes a toxic reaction in the body and leads to Inflammation of lungs or trachea, resulting in breathing problem and sometimes blood vomit¹⁹. In case of inhalation or accidental intake of acids, there can be different reactions which can help to know the acid used. i. In the case of Sulphuric acid, there can be Peroration of stomach, Peritonitis, Laryngeal spasm resulting in death. In case of death Post- mortem findings will indicate symptoms like the erosion of skin, lips, angles of the mouth, Corrosion of Trachea and larynx, blackish charring of the stomach, perforation of the stomach, and Toxic swelling of the liver and kidneys. ii. If Nitric acid is used, it can cause respiratory distress with the symptoms of sulphuric acid. It will indicate yellow discolouration of the skin, corrosion of skin, larynx and trachea congested, stomach wall is soft, friable and ulcerated in post-mortem findings. iii. Lastly, if Hydro-Chloric acid is used for the attack, it can cause Pulmonary-edema, brownish parchmentization, and Inflammation of the respiratory passage.

Another consequence of acid attacks is Scarring of the burned area which can cause permanent disability of any part of the victim and can cause severe pain due to melting of skin and joining of two parts like the nose with the lips or Scars can also restrict body movements and get dried quickly; reducing the elasticity of the skin²⁰.

Psychological consequences: After an acid attack, the vulnerability of the victim is aggravated by another factor, i.e. psychological distress and can develop mental conditions requiring help. Conditions such as PTSD attacks, Anxiety disorder, schizophrenia, insomnia, depression, suicidal thoughts due to disfigurement⁷, Mood swings, fear of re-attack, Isolation and withdrawal from the society etc²¹.

To counter these and for better rehabilitation of the victims, the victim needs to take the help of psychiatrist, psychologist or a counsellor and go through different therapies. Mostly Cognitive – behaviour therapy (CBT) is recommended in such cases as it helps the victim to regain her/his self-confidence and accept the disfigurement²².

Forensic Investigation of Acid Attacks: Another relation between the discipline of forensic science and acid attacks deals with the investigation of the crime. This link is rooted in the Locard's principle dealing with Mutual exchange when two

entities come into contact with each other. In case of acid attacks, this principle is attracted as after the attack, the container of the acid is left sometimes, or the ground-surface have some traces of the acid on the crime scene. And to determine the nature of the acid/poison used by the perpetrator, these pieces of evidence has to be collected from the crime scene to study the toxicology. The Preservation or packaging of such corrosive substance from the crime scene is crucial, and it should be packed separately and tightly to protect contamination of the other forensic pieces of evidence. Evidence of poisons is determined using the instrumental techniques in the laboratories.

In the case of acid attacks, determining the nature of the chemical substance or the poison used is crucial as it helps the police and leads the investigation further. The police can find about the purchase of the identified type of acid used from the local store, as it is obligatory on the stores dealing with acids to maintain proper records²³.

Another role of forensic science is, an identification of the perpetrator as with the rise of the technology new techniques has emerged to improve the detection of small traces at the crime scene such as GC-MS-MS, IRMS, ICP-MS²⁴. Further, the police can also take help of CCTV footage, satellite recordings²⁵ or investigating crimes 3D image to reconstruct the crimescene,²⁶ And to narrow down the suspects according to their appearance or by tracking the distance they travelled.

Medico-legal aspects: Acid throwing is classified as an offence as it is a clear violation of Human rights of the victim, and it leaves the victim in a vulnerable state of severe pain and psychological trauma. It can be said it's a type of an assault with a burning liquid which results in a life-long punishment to the victim.

In India, there was no specific provision dealing with an acid attack and making it a crime before the Criminal law amendment of 2013. Before 2013, it was recognized under the head of Grievous hurt²⁷ as acids are usually thrown on the face of the victim to destroy the vision, to make the person ugly, or to disfigure the skin of the victim. But the problem of charging under this section was the offence of bailable and compoundable and the maximum punishment for such a heinous crime of destroying the life of someone, can maximum be extended till seven years²⁸. Another problem which existed was the section doesn't recognize an attempt to throw acid as an offence. Therefore, there was no rigorous punishment²⁹. Another category under which acid attacks could be classified was murder³⁰ (only in case of death) and attempt³¹ to murder³², but again, the conviction was not certain, as the question of intention to kill is challenging to establish³³.

In 2005 a PIL (Laxmi v Union of India²³) was filed for regulating the sale of acids, restrict the practice of over the counter selling of acid, and to provide adequate compensation to the acid attack sufferers. The apex court in the judgement laid

out some guidelines to regulate the corrosive substance sale under Poison act, 1919 and formulated the Poison Possession and Sale rules 2013 which completely prohibited over the counter sale of acids and laid out a legal obligation on the sellers of acids to maintain proper records as to the name, residence (should be recorded on from an official government document such as Aadhar card, PAN card) and the purpose of the purchaser. Further, the court directed the states to form a Victim Compensation scheme, especially for acid attack survivors.

Simultaneously, to the judgement of the court Law commission in its 226th report (Law Commission of India, The Inclusion of Acid Attacks as Separate offence in Indian Penal Code and Law of Compensation for Survivors of Crime: Report No. 226) and Justice Verma committee³⁴. They are advocated for Acid Attack as a specified offence and the state duty to provide for medical and psychological care to the victim.

After these three significant influencers, the Criminal amendment of 2013 was passed, which recognized acid attack as a sperate offence³⁵, and the intention to cause harm is now presumed in cases of acid attack³⁶. It also provided for Victim compensation scheme³⁷ and an obligation on the hospitals/clinics was made to have exclusive facilities to treat acid attack victims, and in case the hospital refuses to treat the victim, a suit can be brought against it³⁸.

Unfortunately, after the change in law and a judicial precedent, the crime rate concerning acid attacks has increased over the years, and the social discrimination against the victim is continued. As there has been no implementation³⁹ of the guidelines of the court, Victim compensation scheme doesn't provide for a sufficient amount of compensation⁴⁰ and there no speedy mechanism or special courts and investigation team has been set up for the acid attack cases; which delay the Justice and give rise to more suffering⁴¹.

Besides these lacunas there is a positive side to the law and policies also as now over the counter selling of acids is banned and in case of selling proper mechanism has been put into place to record and know who is buying the acid and for what purpose. This is done to easily trace the accused in cases of Zero FIR or unknown accused.

Conclusion

The issue of Acid attacks has always been one of the most discussed topics in gender-based crimes. With the rise in incidences of attack, forensic science has become a crucial discipline as to the investigation and medical treatment of the victim. After studying the role of forensic medicines in acid attacks it can be said that it majorly focuses on two things, first to identification of the nature of the acid so that a proper treatment can be given to the victim and second to help in corroboration of evidence in a trial as the post-mortem reports fairly indicates the physical consequences of the attack. The role

of another key player i.e. investigation is unquestionable as the nature of the acid used help the investigating agency to find a more accurate suspect or investigate better in cases of unknown accused.

To control and reduce these attacks in the country several awareness campaigns have been launched by the government and also the movie Chapak was released last year; which subtly describes and show the journey of Laxmi (a great survivor) so that people can empathize with the physical and psychological pain of the victim. One of the purposes behind the movie was to generate awareness in people and change the mindset of the perpetrators of such a heinous offence. Further, there have been a lot of NGO's and Social groups like Acid survivor trust international. The main objective of these groups is to provide adequate support to the victim and generate awareness in public.

Simultaneously the Author believes that there should be a separate institution within the current system which specifically work with acid attack victims and deals with the investigation so that the Justice can be served on time and a speedy trial can be conducted. Besides this, the Author also suggests that there should be stricter guidelines as to restrict the sale of counter selling of the acids or the medical stores should not be allowed to sell such acids if it's not for the industrial use.

Lastly, it can be said that making law or increasing the punishment to create deterrence in the society is not enough as the real culprit is the mindset of the people who need to be changed. Every person needs to realize that acid attack is a punishment for the whole life of the victim and anyone has no right to punish someone based on just an emotion of distress, jealousy or revenge.

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